

# 2011

## Boy Scout Requirements



Requirements



BOY SCOUTS OF AMERICA®

The requirements for rank advancement, Eagle Palms, and merit badges are effective January 1, 2011, through December 2011. The requirements listed in this book are the official requirements of the Boy Scouts of America. However, the requirements on the following pages might not match those in the *Boy Scout Handbook* and the merit badge pamphlets, because this publication is updated only on an annual basis. These merit badge requirements also appear on the BSA's official website (<http://www.scouting.org>). The requirements posted on the website will coincide with this publication and will be updated at the same time, only on an annual basis.

If a Scout has already started working on a merit badge when a new edition of the pamphlet is introduced, *he may continue to use the same merit badge pamphlet and fulfill the requirements therein to earn the badge*. He need not start over again with the new pamphlet and possibly revised requirements.

No council, district, unit, or individual has the authority to add to, or to subtract from, any advancement requirements. For more detailed information, see the *Advancement Committee Policies and Procedures* book.

## **THIS PRINTING INCLUDES**

### **Rank requirement changes for**

Life—See requirement 6.

The 2009 printing of the *Boy Scout Handbook* inadvertently included bugler as a position of responsibility under Eagle Scout requirement 4; it is not. The requirements herein are correct and official. The corrected Eagle Scout requirement 4 will appear in the next printing of the *Boy Scout Handbook*.

### **Revised merit badge requirements for**

Astronomy, Horsemanship, Nuclear Science

### **Minor merit badge requirement updates for**

Archery (5, options A[f]2 and B[f]2)

Sports (2)

### **New merit badges**

Geocaching

Inventing

Scouting Heritage

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**THIS BOOK BELONGS TO**

# 2011

## **Boy Scout Requirements**



BOY SCOUTS OF AMERICA®



*This booklet is designed  
to bring together the  
requirements for merit  
badges, rank advancements,  
and Eagle Palms, and to  
highlight recognitions for  
special opportunities. Your  
comments and reactions will  
be appreciated. Send them to  
Advancement, S209,  
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1325 West Walnut Hill Lane,  
P.O. Box 152079,  
Irving, TX 75015-2079;  
or e-mail [program.content@  
scouting.org](mailto:program.content@scouting.org).*



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# Age REQUIREMENT Eligibility

*Merit badges, badges of rank, and Eagle Palms are for boys who are registered Boy Scouts or Varsity Scouts. Any registered Boy Scout or Varsity Scout may earn these awards until his 18th birthday. Any Venturer who achieved the First Class rank as a Boy Scout or Varsity Scout in a troop may continue working on the Star, Life, and Eagle ranks and Eagle Palms up to his 18th birthday.*

## Rank Advancement for Venturers



Any Venturer who has achieved the First Class rank as a Boy Scout in a troop or Varsity Scout in a team may continue advancement up to his 18th birthday toward the Star, Life, and Eagle Scout ranks. He must meet the requirements as prescribed in the official *Boy Scout Handbook* and the current *Boy Scout Requirements* book. The Venturer may fulfill leadership requirements by serving as president, vice president, secretary, treasurer, quartermaster, historian, den chief, or guide in his crew, or as boatswain, boatswain's mate, yeoman, purser, or storekeeper in his ship.

The unit leader conference will be conducted by the Advisor or Skipper. As the Venturer meets requirements for the Star and Life ranks, a board of review will be conducted by the crew or ship committee according to the procedures established by the local council.

# Boy Scout Joining REQUIREMENTS

*The rank requirements in this book are official as of January 1, 2011. If a Scout has started work toward a rank before that date using requirements that were current before January 1, 2011, he may complete that rank using the old requirements. Any progress toward a rank that is begun after January 1, 2011, must use the requirements as they are presented in this Boy Scout Requirements book.*



1. Meet the age requirements. Be a boy who is 11 years old, or one who has completed the fifth grade or earned the Arrow of Light Award and is at least 10 years old, but is not yet 18 years old.
2. Find a Scout troop near your home.
3. Complete a Boy Scout application and health history signed by your parent or guardian.
4. Repeat the Pledge of Allegiance.
5. Demonstrate the Scout sign, salute, and handshake.
6. Demonstrate tying the square knot (a joining knot).
7. Understand and agree to live by the Scout Oath, Law, motto, and slogan, and the Outdoor Code.
8. Describe the Scout badge.
9. Complete the pamphlet exercises. With your parent or guardian, complete the exercises in the pamphlet *How to Protect Your Children From Child Abuse: A Parent's Guide*.
10. Participate in a Scoutmaster conference. Turn in your Boy Scout application and health history form signed by your parent or guardian, then participate in a Scoutmaster conference.



# Rank REQUIREMENTS

*The requirements for Tenderfoot, Second Class, and First Class ranks may be worked on simultaneously; however, these ranks must be earned in sequence.*

## one TENDERFOOT Rank Requirements



1. Present yourself to your leader, properly dressed, before going on an overnight camping trip. Show the camping gear you will use. Show the right way to pack and carry it.
2. Spend at least one night on a patrol or troop campout. Sleep in a tent you have helped pitch.
3. On the campout, assist in preparing and cooking one of your patrol's meals. Tell why it is important for each patrol member to share in meal preparation and cleanup, and explain the importance of eating together.
- 4a. Demonstrate how to whip and fuse the ends of a rope.
- 4b. Demonstrate that you know how to tie the following knots and tell what their uses are: two half hitches and the taut-line hitch.
- 4c. Using the EDGE method, teach another person how to tie the square knot.
5. Explain the rules of safe hiking, both on the highway and cross-country, during the day and at night. Explain what to do if you are lost.
6. Demonstrate how to display, raise, lower, and fold the American flag.
7. Repeat from memory and explain in your own words the Scout Oath, Law, motto, and slogan.

8. Know your patrol name, give the patrol yell, and describe your patrol flag.
9. Explain the importance of the buddy system as it relates to your personal safety on outings and in your neighborhood. Describe what a bully is and how you should respond to one.
- 10a. Record your best in the following tests:

**Current results**

Push-ups \_\_\_\_\_

Pull-ups \_\_\_\_\_

Sit-ups \_\_\_\_\_

Standing long jump (\_\_\_\_\_ ft. \_\_\_\_\_ in.)

¼-mile walk/run \_\_\_\_\_

**30 days later**

Push-ups \_\_\_\_\_

Pull-ups \_\_\_\_\_

Sit-ups \_\_\_\_\_

Standing long jump (\_\_\_\_\_ ft. \_\_\_\_\_ in.)

¼-mile walk/run \_\_\_\_\_

- 10b. Show improvement in the activities listed in requirement 10a after practicing for 30 days.

11. Identify local poisonous plants; tell how to treat for exposure to them.

- 12a. Demonstrate how to care for someone who is choking.

- 12b. Show first aid for the following:

- Simple cuts and scrapes
- Blisters on the hand and foot
- Minor (thermal/heat) burns or scalds (superficial, or first-degree)
- Bites or stings of insects and ticks
- Venomous snakebite
- Nosebleed
- Frostbite and sunburn

13. Demonstrate Scout spirit by living the Scout Oath and Scout Law in your everyday life. Discuss four specific examples of how you have lived the points of the Scout Law in your daily life.

14. Participate in a Scoutmaster conference.

15. Complete your board of review.

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NOTE: Alternate requirements for the Tenderfoot rank are available for Scouts with physical or mental disabilities if they meet the criteria listed on page 13 of this book.

# two

## SECOND CLASS Rank Requirements



- 1a. Demonstrate how a compass works and how to orient a map. Explain what map symbols mean.
- 1b. Using a compass and a map together, take a five-mile hike (or 10 miles by bike) approved by your adult leader and your parent or guardian.\*
2. Discuss the principles of Leave No Trace.
- 3a. Since joining, have participated in five separate troop/patrol activities (other than troop/patrol meetings), two of which included camping overnight.
- 3b. On one of these campouts, select your patrol site and sleep in a tent that you pitched. Explain what factors you should consider when choosing a patrol site and where to pitch a tent.
- 3c. Demonstrate proper care, sharpening, and use of the knife, saw, and ax, and describe when they should be used.
- 3d. Use the tools listed in requirement 3c to prepare tinder, kindling, and fuel for a cooking fire.
- 3e. Discuss when it is appropriate to use a cooking fire and a lightweight stove. Discuss the safety procedures for using both.
- 3f. In an approved place and at an approved time, demonstrate how to build a fire and set up a lightweight stove. Note: Lighting the fire is not required.
- 3g. On one campout, plan and cook one hot breakfast or lunch, selecting foods from the food guide pyramid. Explain the importance of good nutrition. Tell how to transport, store, and prepare the foods you selected.
4. Participate in a flag ceremony for your school, religious institution, chartered organization, community, or troop activity. Explain to your leader what respect is due the flag of the United States.
5. Participate in an approved (minimum of one hour) service project.

\*If you use a wheelchair or crutches, or if it is difficult for you to get around, you may substitute "trip" for "hike" in requirement 1b.

6. Identify or show evidence of at least 10 kinds of wild animals (birds, mammals, reptiles, fish, mollusks) found in your community.
- 7a. Show what to do for “hurry” cases of stopped breathing, serious bleeding, and ingested poisoning.
- 7b. Prepare a personal first-aid kit to take with you on a hike.
- 7c. Demonstrate first aid for the following:
  - Object in the eye
  - Bite of a suspected rabid animal
  - Puncture wounds from a splinter, nail, and fishhook
  - Serious burns (partial thickness, or second-degree)
  - Heat exhaustion
  - Shock
  - Heatstroke, dehydration, hypothermia, and hyperventilation
- 8a. Tell what precautions must be taken for a safe swim.
- 8b. Demonstrate your ability to jump feetfirst into water over your head in depth, level off and swim 25 feet on the surface, stop, turn sharply, resume swimming, then return to your starting place.
- 8c. Demonstrate water rescue methods by reaching with your arm or leg, by reaching with a suitable object, and by throwing lines and objects. Explain why swimming rescues should not be attempted when a reaching or throwing rescue is possible, and explain why and how a rescue swimmer should avoid contact with the victim.
- 9a. Participate in a school, community, or troop program on the dangers of using drugs, alcohol, and tobacco and other practices that could be harmful to your health. Discuss your participation in the program with your family, and explain the dangers of substance addictions.
- 9b. Explain the three R’s of personal safety and protection.
10. Earn an amount of money agreed upon by you and your parent, then save at least 50 percent of that money.
11. Demonstrate Scout spirit by living the Scout Oath and Scout Law in your everyday life. Discuss four specific examples (different from those used for Tenderfoot requirement 13) of how you have lived the points of the Scout Law in your daily life.
12. Participate in a Scoutmaster conference.
13. Complete your board of review.

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NOTE: Alternate requirements for the Second Class rank are available for Scouts with physical or mental disabilities if they meet the criteria listed on page 13 of this book.

# three

## FIRST CLASS

### Rank Requirements



1. Demonstrate how to find directions during the day and at night without using a compass.
2. Using a map and compass, complete an orienteering course that covers at least one mile and requires measuring the height and/or width of designated items (tree, tower, canyon, ditch, etc.).
3. Since joining, have participated in 10 separate troop/patrol activities (other than troop/patrol meetings), three of which included camping overnight. Demonstrate the principles of Leave No Trace on these outings.
- 4a. Help plan a patrol menu for one campout that includes at least one breakfast, one lunch, and one dinner, and that requires cooking at least two of the meals. Tell how the menu includes the foods from the food pyramid and meets nutritional needs.
- 4b. Using the menu planned in requirement 4a, make a list showing the cost and food amounts needed to feed three or more boys and secure the ingredients.
- 4c. Tell which pans, utensils, and other gear will be needed to cook and serve these meals.
- 4d. Explain the procedures to follow in the safe handling and storage of fresh meats, dairy products, eggs, vegetables, and other perishable food products. Tell how to properly dispose of camp garbage, cans, plastic containers, and other rubbish.
- 4e. On one campout, serve as your patrol's cook. Supervise your assistant(s) in using a stove or building a cooking fire. Prepare the breakfast, lunch, and dinner planned in requirement 4a. Lead your patrol in saying grace at the meals and supervise cleanup.
5. Visit and discuss with a selected individual approved by your leader (elected official, judge, attorney, civil servant, principal, teacher) your constitutional rights and obligations as a U.S. citizen.
6. Identify or show evidence of at least 10 kinds of native plants found in your community.

- 7a. Discuss when you should and should not use lashings. Then demonstrate tying the timber hitch and clove hitch and their use in square, shear, and diagonal lashings by joining two or more poles or staves together.
- 7b. Use lashing to make a useful camp gadget.
- 8a. Demonstrate tying the bowline knot and describe several ways it can be used.
- 8b. Demonstrate bandages for a sprained ankle and for injuries on the head, the upper arm, and the collarbone.
- 8c. Show how to transport by yourself, and with one other person, a person
  - From a smoke-filled room
  - With a sprained ankle, for at least 25 yards
- 8d. Tell the five most common signals of a heart attack. Explain the steps (procedures) in cardiopulmonary resuscitation (CPR).
- 9a. Tell what precautions must be taken for a safe trip afloat.
- 9b. Successfully complete the BSA swimmer test.\*
- 9c. With a helper and a practice victim, show a line rescue both as tender and as rescuer. (The practice victim should be approximately 30 feet from shore in deep water.)
10. Tell someone who is eligible to join Boy Scouts, or an inactive Boy Scout, about your troop's activities. Invite him to a troop outing, activity, service project, or meeting. Tell him how to join, or encourage the inactive Boy Scout to become active.
11. Describe the three things you should avoid doing related to use of the Internet. Describe a cyberbully and how you should respond to one.
12. Demonstrate Scout spirit by living the Scout Oath and Scout Law in your everyday life. Discuss four specific examples (different from those used for Tenderfoot requirement 13 and Second Class requirement 11) of how you have lived the points of the Scout Law in your daily life.
13. Participate in a Scoutmaster conference.
14. Complete your board of review.

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NOTE: Alternate requirements for the First Class rank are available for Scouts with physical or mental disabilities if they meet the criteria listed on page 13 of this book.

\*See the Swimming merit badge requirements later in this pamphlet for details about the BSA swimmer test.

# **TENDERFOOT, SECOND CLASS, and FIRST CLASS RANKS**

## **Alternate Requirements**

A Scout who has a permanent physical or mental disability and is unable to complete all of the requirements for Tenderfoot, Second Class, or First Class rank may submit a request to the council advancement committee to complete alternate requirements. Below are the procedures for applying for alternate requirements.

- 1. Do As Many Standard Requirements As Possible.** Before applying for alternate requirements, the Scout must complete as many of the standard requirements as his ability permits. He must do his very best to develop himself to the limit of his abilities and resources.
- 2. Secure a Medical Statement.** A clear and concise medical statement concerning the Scout's disabilities or limitations must be submitted by a licensed health-care provider. It must state that the disability is permanent and must outline what physical activities the Scout may not be capable of completing. In the case of a mental disability such as a learning disability, an evaluation statement should be submitted by a certified educational administrator relating the ability level of the Scout.
- 3. Prepare a Request for Alternate Requirements.** A written request must be submitted to the council advancement committee for the Scout to work on alternate requirements for Tenderfoot, Second Class, and First Class ranks. The request should include the standard requirements the Scout has completed and the suggested alternate requirements for those requirements the he cannot complete. This request should be detailed enough for the advancement committee to make an informed decision. The request should be prepared by the Scout, his parents, and his Scoutmaster, and should include a copy of the medical or educational statement as required in No. 2 above.
- 4. The Advancement Committee Reviews the Request.** The council advancement committee should review the request, utilizing the expertise of professional persons involved in Scouts with disabilities. The committee may want to interview the Scout, his parents, and the unit leader to fully understand the request and to make a fair determination. The committee's decision should be recorded and delivered to the Scout and the unit leader.

**No council, district, unit, or individual has the authority to add to, or to subtract from, any advancement requirements. For more detailed information about alternate requirements, see the *Advancement Committee Policies and Procedures* book.**

# STAR Rank Requirements



1. Be active in your troop and patrol for at least four months as a First Class Scout.
2. Demonstrate Scout spirit by living the Scout Oath and Scout Law in your everyday life.
3. Earn six merit badges, including any four from the required list for Eagle.

## Name of Merit Badge

\_\_\_\_\_ (required for Eagle)\*  
\_\_\_\_\_ (required for Eagle)\*  
\_\_\_\_\_ (required for Eagle)\*  
\_\_\_\_\_ (required for Eagle)\*  
\_\_\_\_\_

4. While a First Class Scout, take part in service projects totaling at least six hours of work. These projects must be approved by your Scoutmaster.
5. While a First Class Scout, serve actively for four months in one or more of the following positions of responsibility (or carry out a Scoutmaster-assigned leadership project to help the unit):

**Boy Scout troop.** Patrol leader, assistant senior patrol leader, senior patrol leader, Venture patrol leader, troop guide, Order of the Arrow troop representative, den chief, scribe, librarian, historian, quartermaster, bugler, junior assistant Scoutmaster, chaplain aide, instructor, troop webmaster, or Leave No Trace trainer.

**Varsity Scout team.** Captain, cocaptain, program manager, squad leader, team secretary, Order of the Arrow troop representative, librarian, historian, quartermaster, chaplain aide, instructor, den chief, team webmaster, or Leave No Trace trainer.

**Venturing crew/ship.** President, vice president, secretary, treasurer, den chief, quartermaster, historian, guide, boatswain, boatswain's mate, yeoman, purser, storekeeper, crew/ship webmaster, or Leave No Trace trainer.

6. Take part in a Scoutmaster conference.
7. Complete your board of review.

\*A Scout may choose any of the 15 required merit badges in the 12 categories to fulfill requirement 3. See page 16 of this book for a complete list of required badges for Eagle.



# LIFE

## Rank Requirements



1. Be active in your troop and patrol for at least six months as a Star Scout.
2. Demonstrate Scout spirit by living the Scout Oath and Scout Law in your everyday life.
3. Earn five more merit badges (so that you have 11 in all), including any three more from the required list for Eagle.\*
4. While a Star Scout, take part in service projects totaling at least six hours of work. These projects must be approved by your Scoutmaster.
5. While a Star Scout, serve actively for six months in one or more of the positions of responsibility listed in requirement 5 for Star Scout (or carry out a Scoutmaster-assigned leadership project to help the troop).
6. While a Star Scout, use the EDGE method to teach another Scout (preferably younger than you) the skills from ONE of the following seven choices, so that he is prepared to pass those requirements to his unit leader's satisfaction.
  - a. Second Class—7a and 7c (first aid)
  - b. Second Class—1a (outdoor skills)
  - c. Second Class—3c, 3d, 3e, and 3f (cooking/camping)
  - d. First Class—8a, 8b, 8c, and 8d (first aid)
  - e. First Class—1, 7a, and 7b (outdoor skills)
  - f. First Class—4a, 4b, and 4d (cooking/camping)
  - g. Three requirements from one of the Eagle-required merit badges, as approved by your unit leader
7. Take part in a Scoutmaster conference.
8. Complete your board of review.

\*A Scout may choose any of the 15 required merit badges in the 12 categories to fulfill requirement 3. See page 16 of this book for a complete list of required badges for Eagle.



- Venturing crew/ship.** President, vice president, secretary, treasurer, quartermaster, historian, den chief, guide, boatswain, boatswain's mate, yeoman, purser, storekeeper, webmaster, or Leave No Trace trainer.
5. While a Life Scout, plan, develop, and give leadership to others in a service project helpful to any religious institution, any school, or your community. (The project must benefit an organization other than Boy Scouting.) The project plan must be approved by the organization benefiting from the effort, your Scoutmaster and troop committee, and the council or district before you start. You must use the Eagle Scout Leadership Service Project Workbook, BSA publication No. 521-927, in meeting this requirement.
  6. Take part in a Scoutmaster conference.
  7. Successfully complete an Eagle Scout board of review.

## AGE REQUIREMENT ELIGIBILITY

Merit badges, badges of rank, and Eagle Palms may be earned by a registered Boy Scout, Varsity Scout, or Venturer. **He may earn these awards until his 18th birthday.** Any Venturer who has achieved the First Class rank as a Boy Scout in a troop or Varsity Scout in a team may continue working up to his 18th birthday toward the Star, Life, and Eagle Scout ranks and Eagle Palms. **Scouts and Venturers who have completed all requirements prior to their 18th birthday may be reviewed within three months after that date with no explanation.** Boards of review conducted between three and six months after the candidate's 18th birthday must be preapproved by the local council. A statement by an adult explaining the reason for the delay must be attached to the Eagle Scout Rank Application when it is submitted to the Eagle Scout Service. **Consult the *Advancement Committee Policies and Procedures* book in the case where a board of review is to be conducted more than six months after a candidate's 18th birthday.**

If you have a permanent physical or mental disability, you may become an Eagle Scout by qualifying for as many required merit badges as you can and qualifying for alternative merit badges for the rest. If you seek to become an Eagle Scout under this procedure, you must submit a special application to your local council service center. Your application must be approved by your council advancement committee **before you can work on alternative merit badges.**

A Scout or Venturer with a disability may work toward rank advancement after he is 18 years of age if he meets the guidelines outlined in the *Advancement Committee Policies and Procedures* book.

# **EAGLE SCOUT RANK**

## **Alternate Requirements**

1. The Eagle Scout rank may be achieved by a Boy Scout, Varsity Scout, or qualified\* Venturer who has a physical or mental disability by qualifying for alternate merit badges. This does not apply to individual requirements for merit badges. Merit badges are awarded only when all requirements are met as stated.
2. The physical or mental disability must be of a permanent rather than of a temporary nature.
3. A clear and concise medical statement concerning the Scout's disabilities must be made by a physician licensed to practice medicine, or an evaluation statement must be certified by an educational administrator.
4. The candidate must earn as many of the required merit badges as his ability permits before applying for an alternate Eagle Scout rank merit badge.
5. The Application for Alternate Eagle Scout Award Merit Badges must be completed prior to qualifying for alternate merit badges.
6. The alternate merit badges chosen must be of such a nature that they are as demanding of effort as the required merit badges.
7. When alternates chosen involve physical activity, they must be approved by the physician.
8. The unit leader and the board of review must explain that to attain the Eagle Scout rank, a candidate is expected to do his best in developing himself to the limit of his resources.
9. The application must be approved by the council advancement committee, utilizing the expertise of professional persons involved in Scouting for people with disabilities.
10. The candidate's application for Eagle must be made on the Eagle Scout Rank Application, with the Application for Alternate Eagle Scout Award Merit Badges attached.

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\*In order for a Venturer to be an Eagle candidate, he must have achieved the First Class rank as a Boy Scout or Varsity Scout.

# EAGLE PALMS



After becoming an Eagle Scout, you may earn Palms by completing the following requirements:

1. Be active in your troop and patrol for at least three months after becoming an Eagle Scout or after award of last Palm.\*
2. Demonstrate Scout spirit by living the Scout Oath and Scout Law in your everyday life.
3. Make a satisfactory effort to develop and demonstrate leadership ability.
4. Earn five additional merit badges beyond those required for Eagle or last Palm.†
5. Take part in a Scoutmaster conference.
6. Complete a board of review.

You may wear only the proper combination of Palms for the number of merit badges you earned beyond the rank of Eagle. The Bronze Palm represents five merit badges, the Gold Palm 10, and the Silver Palm 15.

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\*Eagle Palms must be earned in sequence, and the three-month tenure requirement must be observed for each Palm.

†Merit badges earned any time since becoming a Boy Scout may be used to meet this requirement.

# Selecting Leadership **SERVICE PROJECTS**

*Leadership service projects shall be meaningful service not normally expected of a Scout as a part of his school, religious, or community activities.*

## **STAR AND LIFE RANKS**

For Star and Life ranks, a Scout must perform six hours of service to others. This may be done individually or as a patrol or troop project. Star and Life service projects may be approved for Scouts assisting on Eagle service projects. The Scoutmaster approves the project before it is started.

## **EAGLE RANK**

While a Life Scout, a Scout must plan, develop, and give leadership to others in a service project to any religious institution, school, or community.

As a demonstration of leadership, the Scout must plan the work, organize the personnel needed, and direct the project to its completion. No minimum number of hours may be required.

The Eagle service project is an individual matter; therefore, two Eagle candidates may not receive credit for the same project.

Eagle Scout leadership service projects involving council property or other BSA activities are not acceptable for an Eagle service project. The service project also may not be performed for a business or individual, be of a commercial nature, or be a fund-raiser. Any funds raised for a project and not used for the purchase of project materials must be returned to the donors. If this is not practical, the funds must be given to the project beneficiary.

Routine labor, or a job or service normally rendered, should not be considered. An Eagle service project should be of significant magnitude to be special and should represent the candidate's best possible effort.

The Scout must submit his proposed project plan and secure the prior approval of his unit leader, unit committee, and district or council advancement committee, and the organization benefiting from the effort. This is to help assure the project meets the stated standards *before* it is started. This preapproval does not mean the board of review will accept the way the project was carried out.

Upon completion of the project, a detailed report must be submitted with the Scout's Eagle application to include the following information:

- What was the project?
- How did it benefit others?
- Who from the group benefiting from the project gave guidance?
- Who helped carry out the project?
- What materials were used and how were they acquired?

Although the project plan must be approved before work is begun, the board of review must determine if the project was successfully carried out. Questions that must be answered are:

- Did the candidate demonstrate leadership of others?
- Did he indeed direct the project rather than do all of the work himself?
- Was the project of real value to the religious institution, school, or community?
- Who from the project beneficiary may be contacted to verify its value?
- Did the project follow the plan, or were modifications needed to bring it to its completion? **Note:** Modifications need not necessarily void the project.

All the work on the project must be done while the candidate is a Life Scout and before his 18th birthday.

The variety of projects performed throughout the nation by Scouts earning their Eagle Scout Award is staggering. Only those living in an area can determine the greatest value and need there, and decide whether the project is big enough, appropriate, and worth doing. For ideas and opportunities, the Scout can consult people such as school administrators, religious leaders, local government officials, or a United Way agency's personnel.

# Introduction to MERIT BADGES

*On the following pages, in alphabetical order, are the requirements for all of the current merit badges.*

You can learn about sports, crafts, science, trades, business, and future careers as you earn merit badges. There are more than 100 merit badges, and any Boy Scout or Varsity Scout, or any Venturer or Sea Scout who meets the stated requirements, may earn any of these at any time.

**Pick a Subject.** Talk to your unit leader about your interests. Read the requirements of the merit badges you think might interest you, and pick one to earn. Your leader will give you the name of a person from a list of counselors. These individuals have special knowledge in their merit badge subjects and are interested in helping you.

**Scout Buddy System.** *You must have another person with you at each meeting with the merit badge counselor.* This person can be another Scout, your parents or guardian, a brother or sister, a relative, or a friend.

**Call the Merit Badge Counselor.** Get a *signed* Application for Merit Badge, No. 34124, from your unit leader. Get in touch with the merit badge counselor and explain that you want to earn the badge. The counselor may ask to meet you to explain what is expected and to start helping you meet the requirements. You should also discuss work you have already started or possibly completed.

**At the first meeting, you and your merit badge counselor will review and may start working on the requirements. In some cases, you may share the work you have already started or completed.**



**Unless otherwise specified, work on a requirement can be started at any time.** Ask your counselor to help you learn the things you need to know or do. You should read the merit badge pamphlet on the subject. Many troops, schools, and public libraries have them. (See the list on the inside back cover.)

**Show Your Stuff.** When you are ready, call the counselor again to make an appointment. When you go, take along the things you have made to meet the requirements. If they are too big to move, take pictures or have an adult tell in writing what you have done. The counselor will test you on each requirement to make sure you know your stuff and have done or can do the things required.

**Get the Badge.** When the counselor is satisfied you have met each requirement, he or she will sign your application. Give the signed application to your unit leader so your merit badge emblem can be secured for you.

**Requirements.** You are expected to meet the requirements as they are stated—no more and no less. You must do exactly what is stated in the requirements. If it says “show or demonstrate,” that is what you must do. Just telling about it isn’t enough. The same thing holds true for such words as “make,” “list,” “in the field,” and “collect,” “identify,” and “label.”

The requirements listed in this book are the official requirements of the Boy Scouts of America. However, the requirements on the following pages might not match those in the *Boy Scout Handbook* and the merit badge pamphlets, because this publication is updated only on an annual basis.

If a Scout has already started working on a merit badge when a new edition of the pamphlet is introduced, *he may continue to use the same pamphlet and fulfill the requirements therein to earn the badge.* He need not start over again with the new pamphlet and revised requirements.



# A



## American Business

1. Do the following:
  - (a) Explain four features of the free enterprise system in the United States. Tell its benefits and responsibilities. Describe the difference between freedom and license. Tell how the Scout Oath and Law apply to business and free enterprise.
  - (b) Describe the Industrial Revolution. Tell about the major developments that marked the start of the modern industrial era in the United States. Tell about five people who had a great influence on business or industry in the United States. Tell what each did.
2. Do the following:
  - (a) Visit a bank. Talk with one of the officers or staff. Chart the organization of the bank. Show its relationship with other banks, business, and industry.
  - (b) Explain how changes in interest rates, taxes, and government spending affect the flow of money into or out of business and industry.
  - (c) Explain how a proprietorship or partnership gets its capital. Discuss and explain four ways a corporation gets its capital.
  - (d) Explain the place of profit in business.
  - (e) Name five kinds of insurance useful to business. Describe their purposes.
3. Do the following:
  - (a) Pick two or more stocks from the financial pages of a newspaper. Request the annual report or prospectus from one of the companies by writing, or visit its Web site (with your parent's permission) to view the annual report online. Explain how a company's annual report and prospectus can be used to help you manage your investments.
  - (b) Pretend you have bought \$1,000 worth of the stocks from the company you wrote to in requirement 3a. Explain how you "bought" the stocks. Tell why you decided to "buy" stock in this company. Keep a weekly record for three months of the market value of your stocks. Show any dividends declared.
4. Do ONE of the following:
  - (a) Draw an organizational chart of a typical central labor council.
  - (b) Describe automation, union shop, open shop, collective-bargaining agreements, shop steward, business agent, and union counselor.
  - (c) Explain the part played by four federal or state agencies in labor relations.

5. Run a small business involving a product or service for at least three months. First find out the need for it. For example: a newspaper route, lawn mowing, sales of things you have made or grown. Keep records showing the costs, income, and profit or loss.

Report:

- (a) How service, friendliness, hard work, and salesmanship helped build your business.
- (b) The benefits you and others received because you were in business. Comparable 4-H, FFA, or Junior Achievement projects may be used for requirement 5.
6. Do ONE of the following:
- (a) Make an oral presentation to your Scout troop about an e-commerce company. Tell about the benefits and pitfalls of doing business online, and explain the differences between a retailer and an e-commerce company. In your presentation, explain the similarities a retailer and an e-commerce company might share.
- (b) Choose three products from your local grocery store or mall and tell your merit badge counselor how the packaging could be improved upon so that it has less impact on the environment.
- (c) Gather information from news sources and books about a current business leader. Write a two-page biography about this person or make a short presentation to your counselor. Focus on how this person became a successful business leader.



## American Cultures

Choose THREE groups that have different racial, cultural, national, or ethnic backgrounds, one of which comes from your own background. Use these groups to meet requirements 1, 2, and 3.

1. Do TWO of the following, choosing a different group for each:
- (a) Go to a festival, celebration, or other event identified with one of the groups. Report on what you see and learn.
- (b) Go to a place of worship, school, or other institution identified with one of the groups. Report on what you see and learn.
- (c) Talk with a person from one of the groups about the heritage and traditions of the group. Report on what you learn.
- (d) Learn a song, dance, poem, or story that is traditional to one group, and teach it to a group of your friends.
- (e) Go to a library or museum to see a program or exhibit featuring one group's traditions. Report on what you see and learn.

2. Imagine that one of the groups had always lived alone in a city or country to which no other groups ever came. Tell what you think the city or country might be like today. Now tell what you think it might be like if the three groups you chose lived there at the same time.
  3. Tell about some differences between the religious and social customs of the three groups. Tell about some ideas or ways of doing things that are similar in the three groups.
  4. Tell about a contribution made to our country by three different people, each from a different racial, ethnic, or religious background.
  5. Give a talk to your Scout unit or class at school on how people from different groups have gotten along together. Lead a discussion on what can be done to help various groups understand one another better.
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## American Heritage

1. Read the Declaration of Independence. Pay close attention to the section that begins with “We hold these truths to be self-evident” and ends with “to provide new Guards for their future security.” Rewrite that section in your own words, making it as easy to understand as possible. Then, share your writing with your merit badge counselor and discuss the importance of the Declaration to all Americans.
2. Do TWO of the following:
  - (a) Select two individuals from American history, one a political leader (a president, senator, etc.) and the other a private citizen (a writer, religious leader, etc.). Find out about each person’s accomplishments and compare the contributions each has made to America’s heritage.
  - (b) With your counselor’s approval, choose an organization that has promoted some type of positive change in American society. Find out why the organization believed this change was necessary and how it helped to accomplish the change. Discuss how this organization is related to events or situations from America’s past.
  - (c) With your counselor’s approval, interview two veterans of the U.S. military. Find out what their experiences were like. Ask the veterans what they believe they accomplished.
  - (d) With your counselor’s approval, interview three people in your community of different ages and occupations. Ask these people what America means to them, what they think is special about this country, and what American traditions they feel are important to preserve.
3. Do the following:
  - (a) Select a topic that is currently in the news. Describe to your counselor what is happening. Explain how today’s events are related to or affected by the events and values of America’s past.

- (b) For each of the following, describe its adoption, tell about any changes since its adoption, and explain how each one continues to influence Americans today: the flag, the Pledge of Allegiance, the seal, the motto, and the national anthem.
- (c) Research your family's history. Find out how various events and situations in American history affected your family. Share what you find with your counselor. Tell why your family came to America.
4. Do TWO of the following:
- (a) Explain what is meant by the National Register of Historic Places. Describe how a property becomes eligible for listing. Make a map of your local area, marking the points of historical interest. Tell about any National Register properties in your area. Share the map with your counselor, and describe the historical points you have indicated.
- (b) Research an event of historical importance that took place in or near your area. If possible, visit the place. Tell your counselor about the event and how it affected local history. Describe how the area looked then and what it now looks like.
- (c) Find out when, why, and how your town or neighborhood started, and what ethnic, national, or racial groups played a part. Find out how the area has changed over the past 50 years and try to explain why.
- (d) Take an active part in a program about an event or person in American history. Report to your counselor about the program, the part you took, and the subject.
- (e) Visit a historic trail or walk in your area. After your visit, share with your counselor what you have learned. Discuss the importance of this location and explain why you think it might qualify for National Register listing.
5. Do ONE of the following:
- (a) Watch two motion pictures (with the approval and permission of your counselor and parent) that are set in some period of American history. Describe to your counselor how accurate each film is with regard to the historical events depicted and also with regard to the way the characters are portrayed.
- (b) Read a biography (with your counselor's approval) of someone who has made a contribution to America's heritage. Tell some things you admire about this individual and some things you do not admire. Explain why you think this person has made a positive or a negative contribution to America's heritage.
- (c) Listen to recordings of popular songs from various periods of American history. Share five of these songs with your counselor, and describe how each song reflects the way people felt about the period in which it was popular. If a recording is not available, have a copy of the lyrics available.
6. Discuss with your counselor the career opportunities in American heritage. Pick one that interests you and explain how to prepare for this career. Discuss what education and training are required for this career.



## American Labor

- Using resources available to you, learn about working people and work-related concerns. List and briefly describe or give examples of at least EIGHT concerns of American workers. These may include, but are not limited to, working conditions, workplace safety, hours, wages, seniority, job security, equal-opportunity employment and discrimination, guest workers, automation and technologies that replace workers, unemployment, layoffs, outsourcing, and employee benefits such as health care, child care, profit sharing, and retirement benefits.
- With your counselor's and parent's approval and permission, visit the office or attend a meeting of a local union, a central labor council, or an employee organization, or contact one of these organizations via the Internet. Then do EACH of the following:
  - Find out what the organization does.
  - Share the list of issues and concerns you made for requirement 1. Ask the people you communicate with which issues are of greatest interest or concern to them and why.
  - Draw a diagram showing how the organization is structured, from the local to the national level, if applicable.
- Explain to your counselor what labor unions are, what they do, and what services they provide to members. In your discussion, show that you understand the concepts of labor, management, collective bargaining, negotiation, union shops, open (nonunion) shops, grievance procedures, mediation, arbitration, work stoppages, strikes, and lockouts.
- Explain what is meant by the adversarial model of labor-management relations, compared with a cooperative-bargaining style.
- Do ONE of the following:
  - Develop a time line of significant events in the history of the American labor movement from the 1770s to the present.
  - Prepare an exhibit, a scrapbook, or a computer presentation, such as a slide show, illustrating three major achievements of the American labor movement and how those achievements affect American workers.
  - With your counselor's and parent's approval and permission, watch a movie that addresses organized labor in the United States. Afterward, discuss the movie with your counselor and explain what you learned.
  - Read a biography (with your counselor's approval) of someone who has made a contribution to the American labor movement. Explain what contribution this person has made to the American labor movement.
- Explain the term *globalization*. Discuss with your counselor some effects of globalization on the workforce in the United States. Explain how this global workforce fits into the economic system of this country.

7. Choose a labor issue of widespread interest to American workers—an issue in the news currently or known to you from your work on this merit badge. Before your counselor, or in writing, argue both sides of the issue, first taking management’s side, then presenting labor’s or the employee’s point of view. In your presentation, summarize the basic rights and responsibilities of employers and employees, including union members and nonunion members.
  8. Discuss with your counselor the different goals that may motivate the owners of a business, its stockholders, its customers, its employees, the employees’ representatives, the community, and public officials. Explain why agreements and compromises are made and how they affect each group in achieving its goals.
  9. Learn about opportunities in the field of labor relations. Choose one career in which you are interested and discuss with your counselor the major responsibilities of that position and the qualifications, education, and training such a position requires.
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## **Animal Science**

1. Name four breeds of livestock in each of the following classifications: horses, dairy cattle, beef cattle, sheep, hogs. Tell their principal uses and merits. Tell where the breeds originated.
2. List five diseases that afflict the animals in each of the classifications in requirement 1. Also list five diseases of poultry. Describe the symptoms of each disease and explain how each is contracted and how it could be prevented.
3. Explain the major differences in the digestive systems of ruminants, horses, pigs, and poultry. Explain how the differences in structure and function among these four types of digestive tracts affect the nutritional management of these species.
4. Select one type of animal—beef cow, dairy cow, horse, sheep, goat, or hog, or a poultry flock—and tell how you would properly manage it. Include in your discussion nutritional (feeding) concerns, housing, disease prevention, waste control/removal, and breeding programs if appropriate.
5. Explain the importance of setting clear goals for any animal breeding program. Tell how purebred lines of animals are produced. Explain the practice of cross-breeding and the value of this practice.
6. Complete ONE of the following options:

### **Beef Cattle Option**

- (a) Visit a farm or ranch where beef cattle are produced under any of these systems:
  - (1) Feeding market cattle for harvest
  - (2) Cow/calf operation, producing cattle for sale to commercial feeders
  - (3) Producing purebred cattle for sale as breeding stock to others

Talk with the operator to learn how the cattle were handled, fed, weighed, and shipped. Describe what you saw and explain what you learned. If you cannot visit a cattle ranch or farm, view a video from a breed association, or research the Internet (with your parent's permission) for information on beef cattle production. Tell about your findings.

(b) Sketch a plan of a feedlot to include its forage and grain storage facilities, and loading chute for 30 or more fattening steers; or sketch a corral plan with cutting and loading chutes for handling 50 or more beef cows and their calves at one time.

(c) Make a sketch showing the principal wholesale and retail cuts of beef. Tell about the U.S. Department of Agriculture (USDA) dual grading system of beef. Tell the basis of each grade in each system.

(d) Define the following terms: bull, steer, bullock, cow, heifer, freemartin, heiferette, calf.

### **Dairying Option**

(a) Tell how a cow or a goat converts forage and grain into milk. Explain the differences in feeds typically used for dairy cows versus those fed to beef cows.

(b) Make a chart showing the components in cow's milk or goat's milk. Chart the amount of each component.

(c) Explain the requirements for producing grade A milk. Tell how and why milk is pasteurized.

(d) Tell about the kinds of equipment used for milking and the sanitation standards that must be met on dairy farms.

(e) Define the following terms: bull, cow, steer, heifer, springer; buck, doe, kid.

(f) Visit a dairy farm or a milk processing plant. Describe what you saw and explain what you learned. If you cannot visit a dairy farm or processing plant, view a video from a breed or dairy association, or research the Internet (with your parent's permission) for information on dairying. Tell about your findings.

### **Horse Option**

(a) Make a sketch of a useful saddle horse barn and exercise yard.

(b) Tell about the history of the horse and the benefits it has brought to people. Using the four breeds of horses you chose in requirement 1, discuss the different special uses of each breed.

(c) Define the following terms: mare, stallion, gelding, foal, colt, filly; mustang, quarter horse, draft horse, pacer, trotter; pinto, calico, palomino, roan, overo, tobiano.

(d) Visit a horse farm. Describe what you saw and explain what you learned. If you cannot visit a horse farm, view a video from a breed association, or research the Internet (with your parent's permission) for information on horses. Tell about your findings.

(e) Outline the proper feeding of a horse doing light work. Explain why the amount and kind of feed will change according to the kind of horse and the work it does. Describe what colic is, what can cause it, and its symptoms.



### **Sheep Option**

- (a) Make a sketch of a live lamb. Show the location of the various wholesale and retail cuts.
- (b) Discuss how wools are sorted and graded.
- (c) Do ONE of the following:
  - (1) Raise a lamb from weaning to market weight. Keep records of feed intake, weight gains, medication, vaccination, and mortality. Present your records for review by your counselor.
  - (2) Visit a farm or ranch where sheep are raised. Describe what you saw and explain what you learned. If you cannot visit a sheep farm or ranch, view a video from a breed association, or research the Internet (with your parent's permission) for information on sheep. Tell about your findings.
- (d) Describe some differences between the production of purebred and commercial lambs. Then select two breeds that would be appropriate for the production of crossbred market lambs in your region. Identify which breed the ram should be.
- (e) Define the following terms: wether, ewe, ram, lamb.

### **Hog Option**

- (a) Make a sketch showing the principal wholesale and retail cuts of pork. Tell about the recommended USDA grades of pork. Tell the basis for each grade.
- (b) Outline in writing the proper feeding programs used from the breeding of a gilt or sow through the weaning of the litter. Discuss the feeding programs for the growth and finishing periods.
- (c) Do ONE of the following:
  - (1) Raise a feeder pig from weaning to market weight. Keep records of feed intake, weight gains, medication, vaccination, and mortality. Present your records for review by your counselor.
  - (2) Visit a farm where hogs are produced, or visit a packing plant handling hogs. Describe what you saw and explain what you learned. If you cannot visit a hog production unit or packing plant, view a video from a packer or processor, or research the Internet (with your parent's permission) for information on hogs. Tell about your findings.
- (d) Define the following terms: gilt, sow, barrow, boar.

### **Avian Option**

- (a) Make a sketch of a layer house or broiler house showing nests, roosts, feeders, waterers, and means of ventilation. Explain how insulation, ventilation, temperature controls, automatic lights, and other environmental controls are used to protect birds from heat, cold, and bad weather.
- (b) Explain why overcrowding is dangerous for poultry flocks.
- (c) Tell about the grading of eggs. Tell how broilers (fryers) are graded. Describe the classes of chicken meat.
- (d) Do ONE of the following:
  - (1) Manage an egg-producing flock for five months. Keep records of feed purchased, eggs sold, medication, vaccination, and mortality. Present your records for review by your counselor.

(2) Raise 20 chicks from hatching. Keep records of feed intake, weight gains, medication, vaccination, and mortality. Present your records for review by your counselor.

(3) Visit a commercial avian production facility. Describe what you saw and explain what you learned. If you cannot visit a commercial facility, view a video from a poultry association, or research the Internet (with your parent's permission) for information on poultry production. Tell about your findings.

(e) Define the following terms: hen, rooster, chick, capon; tom, poult.

7. Find out about three career opportunities in animal science. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.



## Archaeology

1. Tell what archaeology is and explain how it differs from anthropology, geology, paleontology, and history.
2. Describe each of the following steps of the archaeological process: site location, site excavation, artifact identification and examination, interpretation, preservation, and information sharing.
3. Describe at least two ways in which archaeologists determine the age of sites, structures, or artifacts. Explain what relative dating is.
4. Do TWO of the following:
  - (a) Learn about three archaeological sites located *outside* the United States.
  - (b) Learn about three archaeological sites located *within* the United States.
  - (c) Visit an archaeological site and learn about it.

For EACH site you research for options a, b, or c, point it out on a map and explain how it was discovered. Describe some of the information about the past that has been found at each site. Explain how the information gained from the study of these sites answers questions that archaeologists are asking and how the information may be important to modern people. Compare the relative ages of the sites you research.

5. Choose ONE of the sites you picked for requirement 4 and give a short presentation about your findings to a Cub Scout pack, your Scout troop, your school class, or another group.
6. Do the following:
  - (a) Explain why it is important to protect archaeological sites.
  - (b) Explain what people should do if they think they have found an artifact.
  - (c) Describe the ways in which you can be a protector of the past.

7. Do ONE of the following:
  - (a) Make a list of items you would include in a time capsule. Discuss with your merit badge counselor what archaeologists a thousand years from now might learn from the contents of your capsule about you and the culture in which you live.
  - (b) Make a list of the trash your family throws out during one week. Discuss with your counselor what archaeologists finding that trash a thousand years from now might learn from it about you and your family.
8. Do ONE of the following:
  - (a) Under the supervision of a qualified archaeologist, spend at least eight hours helping to excavate an archaeological site.
  - (b) Under the supervision of a qualified archaeologist, spend at least eight hours in an archaeological laboratory helping to prepare artifacts for analysis, storage, or display.
  - (c) If you are unable to work in the field or in a laboratory under the supervision of a qualified archaeologist, you may substitute a mock dig. To find out how to make a mock dig, talk with a professional archaeologist, trained avocational archaeologist, museum school instructor, junior high or high school science teacher, adviser from a local archaeology society, or other qualified instructor. Plan what you will bury in your artificial site to show use of your “site” during two time periods.
9. Under the supervision of a qualified archaeologist or instructor, do ONE of the following:
  - (a) Help prepare an archaeological exhibit for display in a museum, visitor center, school, or other public area.
  - (b) Use the methods of experimental archaeology to re-create an item or to practice a skill from the past. Write a brief report explaining the experiment and its results.
10. Do ONE of the following:
  - (a) Research American Indians who live or once lived in your area. Find out about traditional lifeways, dwellings, clothing styles, arts and crafts, and methods of food gathering, preparation, and storage. Describe what you would expect to find at an archaeological site for these people.
  - (b) Research settlers or soldiers who were in your area at least 100 years ago. Find out about the houses or forts, ways of life, clothing styles, arts and crafts, and dietary habits of the early settlers, farmers, ranchers, soldiers, or townspeople who once lived in the area where your community now stands. Describe what you would expect to find at an archaeological site for these people.
11. Identify three career opportunities in archaeology. Pick one and explain how to prepare for such a career. Discuss with your counselor what education and training are required, and tell why this profession might interest you.



## Archery

1. Do the following:
  - (a) State and explain the Range Safety Rules:
    - (1) Three safety rules when on the shooting line
    - (2) Three safety rules when retrieving arrows
    - (3) The four whistle commands used on a range and their related verbal commands
  - (b) State and explain the general safety rules for archery. Demonstrate how to safely carry arrows in your hands.
  - (c) Tell about your local and state laws for owning and using archery tackle.
2. Do the following:
  - (a) Name and point to the parts of an arrow.
  - (b) Describe three or more different types of arrows.
  - (c) Name the four principal materials for making arrow shafts.
  - (d) Make a complete arrow from a bare shaft.
  - (e) Explain how to properly care for and store arrows.
3. Do the following:
  - (a) Explain how to properly care for and store tabs, arm guards, shooting gloves, and quivers.
  - (b) Explain the following terms: cast, draw weight, string height (fistmele), aiming, spine, mechanical release, freestyle, and barebow.
  - (c) Make a bowstring.
4. Explain the following:
  - (a) The importance of obedience to a range officer or other person in charge of a range
  - (b) The difference between an end and a round
  - (c) The differences among field, target, and 3-D archery
  - (d) How the five-color National Archery Association (NAA) or Fédération Internationale de Tir à l'Arc (FITA) target is scored
  - (e) How the National Field Archery Association (NFAA) black-and-white field targets and blue indoor targets are scored
  - (f) The elimination system used in Olympic archery competition

5. Do ONE of the following options.

**Option A—Using a Recurve Bow or Longbow**

- (a) Name and point to the parts of the recurve or longbow you are shooting.
- (b) Explain how to properly care for and store recurve bows and longbows.
- (c) Show the nine steps of good shooting for the recurve bow or longbow you are shooting.
- (d) Demonstrate the proper way to string a recurve bow or longbow.
- (e) Locate and mark with dental floss, crimp-on, or other method, the nocking point on the bowstring of the bow that you are using.
- (f) Do ONE of the following:
  - (1) Using a recurve or longbow and arrows with a finger release, shoot a single round of one of the following BSA, NAA, or NFAA rounds:
    - (a) An NFAA field round of 14 targets and make a score of 60 points
    - (b) A BSA Scout field round of 14 targets and make a score of 80 points
    - (c) A Junior 900 round and make a score of 180 points
    - (d) A FITA/NAA indoor\* round I and make a score of 80 points
    - (e) An NFAA indoor\* round and make a score of 50 points
  - (2) Shooting 30 arrows in five-arrow ends at an 80-centimeter (32-inch) five-color target at 15 yards and using the 10 scoring regions, make a score of 150.
  - (3) As a member of the NAA's Junior Olympic Development Program (JOAD), qualify as a Yeoman, Junior Bowman, and Bowman.
  - (4) As a member of the NFAA's Junior Division, earn a Cub or Youth 100-score Progression Patch.

**Option B—Using a Compound Bow**

- (a) Name and point to the parts of the compound bow you are shooting.
- (b) Explain how to properly care for and store compound bows.
- (c) Show the nine steps of good shooting for the compound bow you are shooting.
- (d) Explain why it is necessary to have the string on a compound bow replaced at an archery shop.
- (e) Locate and mark with dental floss, crimp-on, or other method, the nocking point on the bowstring of the bow that you are using.
- (f) Do ONE of the following:
  - (1) Using a compound bow and arrows with a finger release, shoot a single round of one of the following BSA, NAA, or NFAA rounds:
    - (a) An NFAA field round of 14 targets and make a score of 70 points
    - (b) A BSA Scout field round of 14 targets and make a score of 90 points

\*The indoor rounds may be shot outdoors if this is more convenient.

- (c) A Junior 900 round and make a score of 200 points
  - (d) A FITA/NAA indoor\* round I and make a score of 90 points
  - (e) An NFAA indoor\* round and make a score of 60 points
- (2) Shooting 30 arrows in five-arrow ends at an 80-centimeter (32-inch) five-color target at 15 yards and using the 10 scoring regions, make a score of 170.
- (3) As a member of the NAA's Junior Olympic Development Program (JOAD), qualify as a Yeoman, Junior Bowman, and Bowman.
- (4) As a member of the NFAA's Junior Division, earn a Cub or Youth 100-score Progression Patch.

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\*The indoor rounds can be shot outdoors if this is more convenient.

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## Architecture

1. Do the following:
  - (a) Tour your community and list the different types of buildings you see. Try to identify buildings that can be associated with a specific period of history or style of architecture. Make a sketch of the building you most admire.
  - (b) Select an architectural achievement that has had a major impact on society. Using resources such as the Internet (with your parent's permission), books, and magazines, find out how this achievement has influenced the world today. Tell your counselor what you learned.
2. In the Outdoor Code, a Scout pledges to "be conservation-minded." Discuss the following with your counselor:
  - (a) The term *sustainable architecture*. Identify three features typical of green buildings.
  - (b) The difference between renewable building materials and recycled building materials, and how each can be used in construction.
  - (c) The relationship of architecture with its surrounding environment and the community.
  - (d) How entire buildings can be reused rather than torn down when they no longer serve their original purpose.
3. Do ONE of the following:
  - (a) With your parent's and counselor's permission and approval, arrange to meet with an architect. Ask to see the scale model of a building and the drawings that a builder would use to construct this building. Discuss why the different building materials were selected. Look at the details in the drawings and the model to see how the materials and components are attached to each other during construction.

(b) With your parent's and counselor's permission and approval, arrange to meet with an architect at a construction site. Ask the architect to bring drawings that the builder uses to construct the building. While at the site, discuss why the different building materials being used were selected. Discuss how the different building materials and components are attached to each other during construction.

**Note:** To visit a construction site will require advance planning. You will need permission from your parents, counselor, the architect, and the construction site manager. A construction site is a very dangerous place. While there, you will need to closely follow the site manager's directions and comply with all the safety procedures, including wearing a hard hat, protective eyewear, and proper footwear.

(c) Interview someone who might be your client (such as a prospective homeowner or business owner) if you were an architect. Find out what your client's requirements would be for designing a new home or business building. Write a short program including a list of requirements for the project, the functions of the building and site, how the functions relate to one another, and the goals of the project.

4. Measure a room such as one where you live or where your troop meets. Make an accurately scaled drawing of the room's floor plan showing walls, doors, closets, windows, and any built-in furniture or cabinets. Neatly label your drawing with the following: your name, the date, what room you drew, and the scale of the drawing. (Drawing scale:  $\frac{1}{4}$  inch = 1 foot)
5. Find out about three career opportunities in architecture. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.



## Art

1. Tell a story with a picture or pictures or using a 3-D rendering.
2. Do ONE of the following:
  - (a) Design something useful. Make a sketch or model of your design and get your counselor's approval before you proceed. Then create a promotional piece for the item using a picture or pictures.
  - (b) Design a logo. Share your design with your counselor and explain the significance of your logo. Then, with your parent's permission and your counselor's approval, put your logo on Scout equipment, furniture, ceramics, or fabric.
3. Render a subject of your choice in FOUR of these ways:
  - (a) Pen and ink
  - (b) Watercolors
  - (c) Pencil
  - (d) Pastels
  - (e) Oil paints
  - (f) Tempera
  - (g) Acrylics
  - (h) Charcoal
  - (i) Computer drawing or painting

4. With your parent's permission and your counselor's approval, visit a museum, art exhibit, art gallery, artists' co-op, or artist's workshop. Find out about the art displayed or created there. Discuss what you learn with your counselor.
  5. Find out about three career opportunities in art. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.
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## Astronomy

1. Do the following:
  - (a) Describe the proper clothing and other precautions for safely making observations at night and in cold weather.
  - (b) Tell how to safely observe the Sun, objects near the Sun, and the Moon.
  - (c) Explain first aid for injuries or illnesses such as heat and cold reactions, dehydration, bites and stings, and damage to your eyes that could occur during observation.
2. Explain what light pollution is and how it and air pollution affect astronomy.
3. With the aid of diagrams (or real telescopes if available), do each of the following:
  - (a) Explain why binoculars and telescopes are important astronomical tools. Demonstrate or explain how these tools are used.
  - (b) Describe the similarities and differences of several types of astronomical telescopes.
  - (c) Explain the purposes of at least three instruments used with astronomical telescopes.
  - (d) Describe the proper care and storage of telescopes and binoculars both at home and in the field.
4. Do the following:
  - (a) Identify in the sky at least 10 constellations, at least four of which are in the zodiac.
  - (b) Identify at least eight conspicuous stars, five of which are of magnitude 1 or brighter.
  - (c) Make two sketches of the Big Dipper. In one sketch, show the Big Dipper's orientation in the early evening sky. In another sketch, show its position several hours later. In both sketches, show the North Star and the horizon. Record the date and time each sketch was made.
  - (d) Explain what we see when we look at the Milky Way.
5. Do the following:
  - (a) List the names of the five most visible planets. Explain which ones can appear in phases similar to lunar phases and which ones cannot, and explain why.



- (b) Using the Internet (with your parent's permission) and other resources, find out when each of the five most visible planets that you identified in requirement 5a will be observable in the evening sky during the next 12 months, then compile this information in the form of a chart or table.
- (c) Describe the motion of the planets across the sky.
- (d) Observe a planet and describe what you saw.
6. Do the following:
- (a) Sketch the face of the Moon and indicate at least five seas and five craters. Label these landmarks.
- (b) Sketch the phase and the daily position of the Moon, at the same hour and place, for four days in a row. Include landmarks on the horizon such as hills, trees, and buildings. Explain the changes you observe.
- (c) List the factors that keep the Moon in orbit around Earth.
- (d) With the aid of diagrams, explain the relative positions of the Sun, Earth, and the Moon at the times of lunar and solar eclipses, and at the times of new, first-quarter, full, and last-quarter phases of the Moon.
7. Do the following:
- (a) Describe the composition of the Sun, its relationship to other stars, and some effects of its radiation on Earth's weather and communications.
- (b) Define sunspots and describe some of the effects they may have on solar radiation.
- (c) Identify at least one red star, one blue star, and one yellow star (other than the Sun). Explain the meaning of these colors.
8. With your counselor's approval and guidance, do ONE of the following:
- (a) Visit a planetarium or astronomical observatory. Submit a written report, a scrapbook, or a video presentation afterward to your counselor that includes the following information:
- (1) Activities occurring there
  - (2) Exhibits and displays you saw
  - (3) Telescopes and other instruments being used
  - (4) Celestial objects you observed
- (b) Plan and participate in a three-hour observation session that includes using binoculars or a telescope. List the celestial objects you want to observe, and find each on a star chart or in a guidebook. Prepare an observing log or notebook. Show your plan, charts, and log or notebook to your counselor before making your observations. Review your log or notebook with your counselor afterward.
- (c) Plan and host a star party for your Scout troop or other group such as your class at school. Use binoculars or a telescope to show and explain celestial objects to the group.
- (d) Help an astronomy club in your community hold a star party that is open to the public.

- (e) Personally take a series of photographs or digital images of the movement of the Moon, a planet, an asteroid, meteor, or a comet. In your visual display, label each image and include the date and time it was taken. Show all positions on a star chart or map. Show your display at school or at a troop meeting. Explain the changes you observed.
9. List at least three different career opportunities in astronomy. Pick the one in which you are most interested and explain how to prepare for such a career. Discuss with your counselor what courses might be useful for such a career.
- 



## Athletics

1. Show that you know first aid for injuries or illnesses that could occur while participating in athletic events, including sprains, strains, contusions, abrasions, blisters, dehydration, and heat reactions.
2. Explain the following:
  - (a) The importance of the physical exam
  - (b) The importance of maintaining good health habits, especially during training—and how the use of tobacco products, alcohol, and other harmful substances can negatively affect your health and your performance in athletic activities
  - (c) The importance of maintaining a healthy diet
3. Select an athletic activity to participate in for one season (or four months). Then do the following:
  - (a) With guidance from your counselor, establish a personal training program suited to the activity you have chosen.
  - (b) Organize a chart for this activity and monitor your progress during this time.
  - (c) Explain to your counselor the equipment necessary to participate in this activity, and the appropriate clothing for the season and the locale.
  - (d) At the end of the season, discuss with your counselor the progress you have made during training and competition and how your development has affected you mentally and physically.
4. Do the following:
  - (a) Give the rules for two athletic activities, one of which is the activity you chose for requirement 3.
  - (b) Discuss the importance of warming up and cooling down.
  - (c) Explain to your counselor what an amateur athlete is and the differences between an amateur and a professional athlete.
  - (d) Discuss the traits and importance of good sportsmanship. Tell what role sportsmanship plays in both individual and group athletic activities.

5. Complete the activities in FOUR of the following groups and show improvement over a three-month period:

Group 1: Sprinting

- (a) 100-meter dash
- (b) 200-meter dash

Group 2: Long-Distance Running

- (a) 3k run
- (b) 5k run

Group 3: Long Jump OR High Jump

- (a) Running long jump OR running high jump (best of three tries)
- (b) Standing long jump OR standing high jump (best of three tries)

Group 4: Swimming

- (a) 100-meter swim
- (b) 200-meter swim

Group 5: Pull-Ups AND Push-Ups

- (a) Pull-ups in two minutes
- (b) Push-ups in two minutes

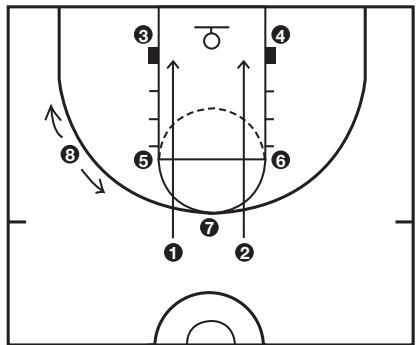
Group 6: Baseball Throw

- (a) Baseball throw for accuracy, 10 throws
- (b) Baseball throw for distance, five throws (total distance)

Group 7: Basketball Shooting

- (a) Basketball shot for accuracy, 10 free-throw shots
- (b) Basketball throw for skill and agility, the following shots as shown on the diagram:

- (1) Left-side layup
- (2) Right-side layup
- (3) Left side of hoop, along the key line
- (4) Right side of hoop, along the key line
- (5) Where key line and free-throw line meet, left side
- (6) Where key line and free-throw line meet, right side
- (7) Top of the key
- (8) Anywhere along the three-point line



Group 8: Football Kick OR Soccer Kick

- (a) Goals from the 10-yard line, eight kicks
- (b) Football kick or soccer kick for distance, five kicks (total distance)

Group 9: Weight Training

- (a) Chest/bench press, two sets of 15 repetitions each
- (b) Leg curls, two sets of 15 repetitions each

6. Do the following:

- (a) Prepare plans for conducting a sports meet or field day that includes 10 activities, at least five of which must come from the groups mentioned in requirement 5. Outline the duties of each official needed and list the equipment the meet will require.
- (b) With your parent's and counselor's approval, serve as an official or volunteer at a sports meet to observe officials in action. Tell your counselor about your responsibilities at the meet and discuss what you learned.



## Automotive Maintenance

You will need access to a car or truck and its owner's manual to meet some requirements for this merit badge.

1. Discuss with your counselor the safety equipment, tools, and clothing used while checking or repairing a motor vehicle. Use this equipment, tools, and/or clothing (when needed or called for) in meeting the requirements for this merit badge.
2. **General Maintenance, Safety, and Registration.** Do the following:
  - (a) Review the maintenance chart in the owner's manual. Explain the requirements and time limits.
  - (b) Demonstrate how to check the following:
    - (1) Brake fluid
    - (2) Engine oil
    - (3) Coolant
    - (4) Power steering fluid
    - (5) Windshield washer fluid
    - (6) Transmission fluid
    - (7) Battery fluid (if possible) and condition of the battery terminals
  - (c) Locate the fuse boxes; determine the size of fuses. Demonstrate the proper replacement of burned-out fuses.
  - (d) Demonstrate how to check the condition and tension of belts and hoses.
  - (e) Check the lighting in the vehicle, including instrument, warning, and exterior bulbs.

- (f) Locate and check the air filter.
  - (g) Explain the purpose, importance, and limitations of safety belts and passive restraints.
  - (h) Find out the requirements for the state inspection in your state, including how often a vehicle needs to be inspected.
  - (i) Explain the importance of registering a vehicle and find out the annual registration fee for renewing your family car's registration.
3. **Dashboard.** Do the following:
- (a) Explain the function of the fuel gauge, speedometer, tachometer, oil pressure, and engine temperature gauge. Point each one out on the instrument cluster.
  - (b) Explain the symbols that light up on the dashboard and the difference between the yellow and red symbols. Explain each of the indicators on the dashboard, using the owner's manual if necessary.
4. **Tires.** Do the following:
- (a) Explain the difference between tire manufacturer's and vehicle manufacturer's specifications and show where to find them.
  - (b) Demonstrate how to check tire pressure and properly inflate a tire. Check the spare tire and make sure it is ready for use.
  - (c) Explain why wheel alignment is important to the life of a tire. Explain caster, camber, and toe-in adjustments on wheel alignment.
  - (d) Explain the purpose of the lateral-wear bar indicator.
  - (e) Explain how to dispose of old tires in accordance with local laws and regulations.
5. **Engine.** Do the following:
- (a) Explain how an internal combustion engine operates. Tell the differences between gasoline and diesel engines. Explain how a gasoline-electric hybrid vehicle is powered.
  - (b) Discuss the purpose of engine oil. Explain the API service code, the SAE number, and the viscosity rating.
  - (c) Explain where to find the recommended oil type and the amount of oil to be used in the vehicle engine.
6. **Cooling System.** Do the following:
- (a) Explain the need for coolant in the cooling system.
  - (b) Explain how to flush and change the engine coolant in the vehicle, and how to properly dispose of the used coolant.
7. **Fuel System.** Do the following:
- (a) Explain how the air and fuel systems work together and why it is necessary to have an air filter and fuel filter.
  - (b) Explain how a fuel injection system works and how an onboard computer works with the fuel injection system.
8. **Ignition and Electrical Systems.** Do the following:
- (a) Diagram and explain the parts of the electrical system.
  - (b) Explain the cylinder engine sequence.
  - (c) Explain the purpose of the spark gap.

- (d) Demonstrate how to change the spark plugs in any internal combustion engine (lawn mower, dirt bike, motorcycle).
- (e) Demonstrate how to safely connect jumper cables to your car battery.
9. **Drive Train.** Do the following:
- (a) Diagram the drive train and explain the different parts.
  - (b) Explain the difference between automatic and standard transmissions.
  - (c) Explain the types of automatic transmission fluid.
  - (d) Explain the types of lubricants used in a standard transmission and in the differential.
  - (e) Explain the difference between front-wheel, rear-wheel, and four-wheel drive.
10. **Brake System.** Do the following:
- (a) Explain the brake system (including antilock systems) and how it operates.
  - (b) Explain the differences between disc and drum systems.
  - (c) Demonstrate how to check the condition of a vehicle's brake system. After checking, make recommendations for repairs (if necessary).
11. Do TWO of the following:
- (a) Determine the value of three different vehicles you are interested in purchasing. One must be new and one must be used; the third vehicle can be new or used. For each vehicle, find out the requirements and cost of automobile insurance to include basic liability and options for collision, comprehensive, towing, and rental car. Using the three vehicles you chose and with your merit badge counselor's assistance, complete the operation/maintenance chart provided in the merit badge pamphlet. Use this information to determine the operating cost per mile for each vehicle, and discuss what you learn with your counselor.
  - (b) Choose a car cleaner and wax product for a vehicle you want to clean. Explain clear-coat paint and the precautions necessary for care. Clean the vehicle, both inside and out, and wax the exterior. Use a vinyl and rubber protectant (on vinyl tops, rubber door seals, sidewalls, etc.) and explain the importance of this protectant.
  - (c) Locate the manufacturer's jack. Use the jack to demonstrate how to engage the jack correctly on the vehicle, then change a tire correctly.
  - (d) Perform an oil filter and oil change on a vehicle. Explain how to properly dispose of the used oil and filter.
12. Find out about three career opportunities in the automotive industry. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.



## Aviation

1. Do the following:
  - (a) Define “aircraft.” Describe some kinds and uses of aircraft today. Explain the operation of piston, turboprop, and jet engines.
  - (b) Point out on a model airplane the forces that act on an airplane in flight.
  - (c) Explain how an airfoil generates lift, how the primary control surfaces (ailerons, elevators, and rudder) affect the airplane’s attitude, and how a propeller produces thrust.
  - (d) Demonstrate how the control surfaces of an airplane are used for takeoff, straight climb, level turn, climbing turn, descending turn, straight descent, and landing.
  - (e) Explain the following: the recreational pilot and the private pilot certificates; the instrument rating.
2. Do TWO of the following:
  - (a) Take a flight in an aircraft, with your parent’s permission. Record the date, place, type of aircraft, and duration of flight, and report on your impressions of the flight.
  - (b) Under supervision, perform a preflight inspection of a light airplane.
  - (c) Obtain and learn how to read an aeronautical chart. Measure a true course on the chart. Correct it for magnetic variation, compass deviation, and wind drift. Arrive at a compass heading.
  - (d) Using one of many flight simulator software packages available for computers, “fly” the course and heading you established in requirement 2c or another course you have plotted.
  - (e) On a map, mark a route for an imaginary airline trip to at least three different locations. Start from the commercial airport nearest your home. From timetables (obtained from agents or online from a computer, with your parent’s permission), decide when you will get to and leave from all connecting points. Create an aviation flight plan and itinerary for each destination.
  - (f) Explain the purposes and functions of the various instruments found in a typical single-engine aircraft: attitude indicator, heading indicator, altimeter, airspeed indicator, turn and bank indicator, vertical speed indicator, compass, navigation (GPS and VOR) and communication radios, tachometer, oil pressure gauge, and oil temperature gauge.
  - (g) Create an original poster of an aircraft instrument panel. Include and identify the instruments and radios discussed in requirement 2f.
3. Do ONE of the following:
  - (a) Build and fly a fuel-driven or battery-powered electric model airplane. Describe safety rules for building and flying model airplanes. Tell safety rules for use of glue, paint, dope, plastics, fuel, and battery pack.
  - (b) Build a model FPG-9. Get others in your troop or patrol to make their own model, then organize a competition to test the precision of flight and landing of the models.

4. Do ONE of the following:
  - (a) Visit an airport. After the visit, report on how the facilities are used, how runways are numbered, and how runways are determined to be “active.”
  - (b) Visit a Federal Aviation Administration facility—a control tower, terminal radar control facility, air route traffic control center, flight service station, or Flight Standards District Office. (Phone directory listings are under U.S. Government Offices, Transportation Department, Federal Aviation Administration. Call in advance.) Report on the operation and your impressions of the facility.
  - (c) Visit an aviation museum or attend an air show. Report on your impressions of the museum or show.
5. Find out about three career opportunities in aviation. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.



# B



## Backpacking

1. Discuss the prevention of and treatment for the health concerns that could occur while backpacking, including hypothermia, heat reactions, frostbite, dehydration, insect stings, tick bites, snakebite, and blisters.
2. Do the following:
  - (a) List 10 items that are essential to be carried on any backpacking trek and explain why each item is necessary.
  - (b) Describe 10 ways you can limit the weight and bulk to be carried in your pack without jeopardizing your health or safety.
3. Do the following:
  - (a) Define limits on the number of backpackers appropriate for a trek crew.
  - (b) Describe how a trek crew should be organized.
  - (c) Tell how you would minimize risk on a backpacking trek.
4. Do the following:
  - (a) Describe the importance of using Leave No Trace principles while backpacking, and at least five ways you can lessen the crew's impact on the environment.
  - (b) Describe proper methods of handling human and other wastes while on a backpacking trek. Describe the importance of and means to assure personal cleanliness while on a backpacking trek.
  - (c) Tell what factors are important in choosing a campsite.
5. Do the following:
  - (a) Demonstrate two ways to treat water and tell why water treatment is essential.
  - (b) Explain to your counselor the importance of staying well-hydrated during a trek.
6. Do the following:
  - (a) Demonstrate that you can read topographic maps.
  - (b) While on a trek, use a map and compass to establish your position on the ground at least three times at three different places, OR use a GPS receiver to establish your position on a topographic map and on the ground at least three times at three different places.
  - (c) Explain how to stay found, and what to do if you get lost.

7. Tell how to prepare properly for and deal with inclement weather.
8. Do the following:
  - (a) Explain the advantages and disadvantages of three different types of backpacking stoves using at least three different types of fuel.
  - (b) Demonstrate that you know how to operate a backpacking stove safely and to handle liquid fuel safely.
  - (c) Prepare at least three meals using a stove and fuel you can carry in a backpack.
  - (d) Demonstrate that you know how to keep cooking and eating gear clean and sanitary, and that you practice proper methods for food storage while on a backpacking trek.
9. Do the following:
  - (a) Write a plan for a patrol backpacking hike that includes a schedule.
  - (b) Show that you know how to properly pack your personal gear and your share of the crew's gear and food.
  - (c) Show you can properly shoulder your pack and adjust it for proper wear.
  - (d) Conduct a prehike inspection of the patrol and its equipment.
  - (e) While carrying your pack, complete a hike of at least 2 miles.
10. Using Leave No Trace principles, participate in at least three backpacking treks of at least three days each and at least 15 miles each, and using at least two different campsites on each trek. Carry everything you will need throughout the trek.
11. Do the following:
  - (a) Write a plan for a backpacking trek of at least five days using at least three different campsites and covering at least 30 miles. Your plan must include a description of and route to the trek area, a schedule (including a daily schedule), a list of food and equipment needs, a safety and emergency plan, and a budget.
  - (b) Using Leave No Trace principles, take the trek you have planned and, while on the trek, complete at least one service project approved by your merit badge counselor.
  - (c) Keep a daily journal during the trek that includes a day-by-day description of your activities, including notes about what worked well and thoughts about improvements that could be made for the next trek.



## Basketry

1. Describe precautions you should take to safely use basketry tools and materials.
2. Do the following:
  - (a) Show your counselor that you are able to identify each of the following types of baskets: plaited, coiled, ribbed, and wicker.
  - (b) Describe three different types of weaves to your counselor.
3. Plan and weave EACH of the following projects:
  - (a) a square basket
  - (b) a round basket
  - (c) a campstool seat



## Bird Study

1. Explain the need for bird study and why birds are useful indicators of the quality of the environment.
2. Show that you are familiar with the terms used to describe birds by sketching or tracing a perched bird and then labeling 15 different parts of the bird. Sketch or trace an extended wing and label six types of wing feathers.
3. Demonstrate that you know how to properly use and care for binoculars.
  - (a) Explain what the specification numbers on the binoculars mean.
  - (b) Show how to adjust the eyepiece and how to focus for proper viewing.
  - (c) Show how to properly care for and clean the lenses.
4. Demonstrate that you know how to use a bird field guide. Show your counselor that you are able to understand a range map by locating in the book and pointing out the wintering range, the breeding range, and/or the year-round range of one species of each of the following types of birds:
  - (a) seabird
  - (b) plover
  - (c) falcon or hawk
  - (d) warbler or vireo
  - (e) heron or egret

- (f) sparrow
  - (g) nonnative bird (introduced to North America from a foreign country since 1800)
5. Observe and be able to identify at least 20 species of wild birds. Prepare a field notebook, making a separate entry for each species, and record the following information from your field observations and other references.
- (a) Note the date and time.
  - (b) Note the location and habitat.
  - (c) Describe the bird's main feeding habitat and list two types of food that the bird is likely to eat.
  - (d) Note whether the bird is a migrant or a summer, winter, or year-round resident of your area.
6. Explain the function of a bird's song. Be able to identify five of the 20 species in your field notebook by song or call alone. For each of these five species, enter a description of the song or call, and note the behavior of the bird making the sound. Note why you think the bird was making the call or song that you heard.
7. Do ONE of the following:
- (a) Go on a field trip with a local club or with others who are knowledgeable about birds in your area.
    - (1) Keep a list or fill out a checklist of all the birds your group observed during the field trip.
    - (2) Tell your counselor which birds your group saw and why some species were common and some were present in small numbers.
    - (3) Tell your counselor what makes the area you visited good for finding birds.
  - (b) By using a public library or contacting the National Audubon Society, find the name and location of the Christmas Bird Count nearest your home and obtain the results of a recent count.
    - (1) Explain what kinds of information are collected during the annual event.
    - (2) Tell your counselor which species are most common, and explain why these birds are abundant.
    - (3) Tell your counselor which species are uncommon, and explain why these were present in small numbers. If the number of birds of these species is decreasing, explain why, and what, if anything, could be done to reverse their decline.
8. Do ONE of the following. For the option you choose, describe what birds you hope to attract, and why.
- (a) Build a bird feeder and put it in an appropriate place in your yard or another location.
  - (b) Build a birdbath and put it in an appropriate place.
  - (c) Build a backyard sanctuary for birds by planting trees and shrubs for food and cover.



## Bugling

1. Give a brief history of the bugle.
2. Do the following:
  - (a) Explain and demonstrate how the bugle makes sound, and explain how the bugle is related to other brass wind instruments.
  - (b) Compose a bugle call for your troop or patrol to signal a common group activity, such as assembling for mealtime or striking a campsite.
3. Sound the following bugle calls: “First Call,” “Reveille,” “Assembly,” “Mess,” “Drill,” “Fatigue,” “Officers,” “Recall,” “Church,” “Swimming,” “Fire,” “Retreat,” “To the Colors,” “Call to Quarters,” and “Taps.”
4. Explain when each of the calls in requirement 3 is used.
5. Explain how to care for, clean, and maintain a bugle.
6. Serve as bugler in your troop for three months.\*

\*NOTE: A bugle, trumpet, or cornet may be used to meet these requirements.

# C



## Camping

1. Show that you know first aid for and how to prevent injuries or illnesses that could occur while camping, including hypothermia, frostbite, heat reactions, dehydration, altitude sickness, insect stings, tick bites, snakebite, blisters, and hyperventilation.
2. Learn the Leave No Trace principles and the Outdoor Code and explain what they mean. Write a personal and group plan for implementing these principles on your next outing.
3. Make a written plan for an overnight trek and show how to get to your camping spot using a topographical map and compass OR a topographical map and a GPS receiver.
4. Do the following:
  - (a) Make a duty roster showing how your patrol is organized for an actual overnight campout. List assignments for each member.
  - (b) Help a Scout patrol or a Webelos Scout unit in your area prepare for an actual campout, including creating the duty roster, menu planning, equipment needs, general planning, and setting up camp.
5. Do the following:
  - (a) Prepare a list of clothing you would need for overnight campouts in both warm and cold weather. Explain the term “layering.”
  - (b) Discuss footwear for different kinds of weather and how the right footwear is important for protecting your feet.
  - (c) Explain the proper care and storage of camping equipment (clothing, footwear, bedding).
  - (d) List the outdoor essentials necessary for any campout, and explain why each item is needed.
  - (e) Present yourself to your Scoutmaster with your pack for inspection. Be correctly clothed and equipped for an overnight campout.

6. Do the following:
  - (a) Describe the features of four types of tents, when and where they could be used, and how to care for tents. Working with another Scout, pitch a tent.
  - (b) Discuss the importance of camp sanitation and tell why water treatment is essential. Then demonstrate two ways to treat water.
  - (c) Describe the factors to be considered in deciding where to pitch your tent.
  - (d) Tell the difference between internal- and external-frame packs. Discuss the advantages and disadvantages of each.
  - (e) Discuss the types of sleeping bags and what kind would be suitable for different conditions. Explain the proper care of your sleeping bag and how to keep it dry. Make a comfortable ground bed.
7. Prepare for an overnight campout with your patrol by doing the following:
  - (a) Make a checklist of personal and patrol gear that will be needed.
  - (b) Pack your own gear and your share of the patrol equipment and food for proper carrying. Show that your pack is right for quickly getting what is needed first, and that it has been assembled properly for comfort, weight, balance, size, and neatness.
8. Do the following:
  - (a) Explain the safety procedures for
    - (1) Using a propane or butane/propane stove
    - (2) Using a liquid fuel stove
    - (3) Proper storage of extra fuel
  - (b) Discuss the advantages and disadvantages of different types of lightweight cooking stoves.
  - (c) Prepare a camp menu. Explain how the menu would differ from a menu for a backpacking or float trip. Give recipes and make a food list for your patrol. Plan two breakfasts, three lunches, and two suppers. Discuss how to protect your food against bad weather, animals, and contamination.
  - (d) Cook at least one breakfast, one lunch, and one dinner for your patrol from the meals you have planned for requirement 8c. At least one of those meals must be a trail meal requiring the use of a lightweight stove.
9. Show experience in camping by doing the following:
  - (a) Camp a total of at least 20 days and 20 nights. The 20 days and 20 nights must be at a designated Scouting activity or event. Sleep each night under the sky or in a tent you have pitched. You may use a week of long-term camp toward this requirement. If the camp provides a tent that has already been pitched, you need not pitch your own tent.
  - (b) On any of these camping experiences, you must do TWO of the following, only with proper preparation and under qualified supervision.
    - (1) Hike up a mountain, gaining at least 1,000 vertical feet.
    - (2) Backpack, snowshoe, or cross-country ski for at least 4 miles.

- (3) Take a bike trip of at least 15 miles or at least four hours.
  - (4) Take a nonmotorized trip on the water of at least four hours or 5 miles.
  - (5) Plan and carry out an overnight snow camping experience.
  - (6) Rappel down a rappel route of 30 feet or more.
- (c) Perform a conservation project approved by the landowner or land managing agency.
10. Discuss how the things you did to earn this badge have taught you about personal health and safety, survival, public health, conservation, and good citizenship. In your discussion, tell how Scout spirit and the Scout Oath and Law apply to camping and outdoor ethics.
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## Canoeing

1. Show that you know first aid for injuries or illnesses that could occur while canoeing, including hypothermia, heat reactions, dehydration, insect stings, tick bites, and blisters.
2. Do the following:
  - (a) Identify the conditions that must exist before performing CPR on a person. Explain how such conditions are recognized.
  - (b) Demonstrate the proper technique for performing CPR using a training device approved by your counselor.
3. Before doing the following requirements, successfully complete the BSA swimmer test: Jump feetfirst into water over the head in depth. Level off and swim 75 yards in a strong manner using one or more of the following strokes: sidestroke, breaststroke, trudgen, or crawl; then swim 25 yards using an easy, resting backstroke. The 100 yards must be completed in one swim without stops and must include at least one sharp turn. After completing the swim, rest by floating.
4. Discuss the following:
  - (a) The BSA Safety Afloat policy. Tell how it applies to canoeing activities.
  - (b) The most common weather and water-related hazards encountered while canoeing and how to deal safely with each one.
5. Do the following:
  - (a) Name and point out the major parts of a canoe.
  - (b) Describe how the length and shape of a canoe affect its performance.
  - (c) Discuss the advantages and disadvantages of the different materials used to make canoes.



- (d) Name and point out the parts of a paddle. Explain the difference between a straight and bent-shaft paddle and when each is best used.
  - (e) Demonstrate how to size correctly a paddle for a paddler in a sitting position and a kneeling position.
  - (f) Name the different types of personal flotation devices (PFDs), and explain when each type should be used.
  - (g) Show how to fit and test properly a PFD of correct size.
  - (h) Discuss the general care and maintenance of canoeing equipment.
  - (i) Discuss what personal and group equipment would be appropriate for a canoe camping trip. Describe how personal and group equipment can be packed and protected from water.
  - (j) Demonstrate how to load and secure equipment in a canoe.
  - (k) Using appropriate knots, demonstrate how to secure a canoe to a rack on land, a vehicle, or a canoe trailer.
6. With a companion, wearing the proper PFD and appropriately dressed for the weather and water conditions, use a properly equipped canoe to demonstrate the following:
- (a) Safely carry and launch the canoe from a dock or shore (both, if possible).
  - (b) Safely land the canoe on a dock or shore (both, if possible) and return it to its proper storage location.
  - (c) Demonstrate kneeling and sitting positions in a canoe and explain the proper use for each position.
  - (d) Change places while afloat in the canoe.
  - (e) In deep water, exit the canoe and get back in without capsizing.
  - (f) Capsize the canoe and demonstrate how staying with a capsized canoe will support both paddlers.
  - (g) Swim, tow, or push a swamped canoe 50 feet to shallow water. In the shallow water, empty the swamped canoe and reenter it.
  - (h) In deep water, rescue a swamped canoe and its paddlers by emptying the swamped canoe and helping the paddlers safely reenter their boat without capsizing.
7. With a companion, wearing the proper PFD and appropriately dressed for the weather and water conditions, demonstrate the following paddling strokes as both a bow and stern paddler:
- (a) Forward stroke
  - (b) Backstroke
  - (c) Draw
  - (d) Pushaway

- (e) Forward sweep
- (f) Reverse or back sweep

For stern paddling only:

- (g) J-stroke

8. Using the strokes in requirement 7, demonstrate the following tandem maneuvers while paddling on opposite sides and without changing sides. Repeat after switching positions and paddling sides:
  - (a) Pivot or spin the canoe in either direction.
  - (b) Move the canoe sideways or abeam in either direction.
  - (c) Stop the canoe.
  - (d) Move the canoe in a straight line for 50 yards.
9. Wearing the proper PFD and appropriately dressed for the weather and water conditions, demonstrate solo canoe handling:
  - (a) Launch from shore or a pier (both, if possible).
  - (b) Using a single-blade paddle and paddling only on one side, demonstrate proper form and use of the forward stroke, backstroke, draw stroke, pushaway stroke, forward sweep, reverse or back sweep, and J-stroke. Repeat while paddling on the other side.
  - (c) While paddling on one side only, paddle a 50-yard course making at least one turn underway and one reverse of direction. Repeat while paddling on the other side.
  - (d) Make a proper landing at a dock or shore (both, if possible). Store canoe properly (with assistance, if needed).
  - (e) In deep water, exit the canoe and then get back in without capsizing.
10. Discuss the following types of canoeing:
  - (a) Olympic flatwater
  - (b) Outrigger
  - (c) Marathon
  - (d) Freestyle
  - (e) Whitewater
  - (f) Canoe poling



## Chemistry

1. Do EACH of the following:
  - (a) Describe three examples of safety equipment used in a chemistry laboratory and the reason each one is used.
  - (b) Describe what a material safety data sheet (MSDS) is and tell why it is used.
  - (c) Obtain an MSDS for both a paint and an insecticide. Compare and discuss the toxicity, disposal, and safe-handling sections for these two common household products.
  - (d) Discuss the safe storage of chemicals. How does the safe storage of chemicals apply to your home, your school, your community, and the environment?
2. Do EACH of the following:
  - (a) Predict what would happen if you placed an iron nail in a copper sulfate solution. Then, put an iron nail in a copper sulfate solution. Describe your observations and make a conclusion based on your observations. Compare your prediction and original conclusion with what actually happened. Write the formula for the reaction that you described.
  - (b) Describe how you would separate sand from water, table salt from water, oil from water, and gasoline from motor oil. Name the practical processes that require these kinds of separations.
  - (c) Describe the difference between a chemical reaction and a physical change.
3. Construct a Cartesian diver. Describe its function in terms of how gases in general behave under different pressures and different temperatures. Describe how the behavior of gases affects a backpacker at high altitudes and a scuba diver underwater.
4. Do EACH of the following:
  - (a) Cut a round onion into small chunks. Separate the onion chunks into three equal portions. Leave the first portion raw. Cook the second portion of onion chunks until the pieces are translucent. Cook the third portion until the onions are caramelized, or brown in color. Taste each type of onion. Describe the taste of raw onion versus partially cooked onion versus caramelized onion. Explain what happens to molecules in the onion during the cooking process.
  - (b) Describe the chemical similarities and differences between toothpaste and an abrasive household cleanser. Explain how the end use or purpose of a product affects its chemical formulation.
  - (c) In a clear container, mix a half-cup of water with a tablespoon of oil. Explain why the oil and water do not mix. Find a substance that will help the two combine, and add it to the mixture. Describe what happened, and explain how that substance worked to combine the oil and water.

5. List the four classical divisions of chemistry. Briefly describe each one, and tell how it applies to your everyday life.
6. Do EACH of the following:
- (a) Name two government agencies that are responsible for tracking the use of chemicals for commercial or industrial use. Pick one agency and briefly describe its responsibilities to the public and the environment.
  - (b) Define pollution. Explain the chemical effects of ozone, global warming, and acid rain. Pick a current environmental problem as an example. Briefly describe what people are doing to resolve this hazard and to increase understanding of the problem.
  - (c) Using reasons from chemistry, describe the effect on the environment of ONE of the following:
    - (1) The production of aluminum cans or plastic milk cartons
    - (2) Sulfur from burning coal
    - (3) Used motor oil
    - (4) Newspaper
  - (d) Briefly describe the purpose of phosphates in fertilizer and in laundry detergent. Explain how the use of phosphates in fertilizers affects the environment. Also, explain why phosphates have been removed from laundry detergents.
7. Do ONE of the following activities:
- (a) Visit a laboratory and talk to a practicing chemist. Ask what the chemist does and what training and education are needed to work as a chemist.
  - (b) Using resources found at the library and in periodicals, books, and the Internet (with your parent's permission), learn about two different kinds of work done by chemists, chemical engineers, chemical technicians, or industrial chemists. For each of the four jobs, find out the education and training requirements.
  - (c) Visit an industrial plant that makes chemical products or uses chemical processes and describe the processes used. What, if any, pollutants are produced and how are they handled?
  - (d) Visit a county farm agency or similar governmental agency and learn how chemistry is used to meet the needs of agriculture in your county.



## Cinematography

1. Do the following:
  - (a) Discuss and demonstrate the proper elements of a good motion picture. In your discussion, include visual storytelling, rhythm, the 180-axis rule, camera movement, framing and composition of camera shots, and lens selection.
  - (b) Discuss the cinematographer's role in the moviemaking process.
2. Do the following:
  - (a) In a three- or four-paragraph treatment, tell the story you plan to film, making sure that the treatment conveys a visual picture.
  - (b) Prepare a storyboard for your motion picture. (This can be done with rough sketches and stick figures.)
  - (c) Demonstrate the following motion picture shooting techniques:
    - (1) Using a tripod
    - (2) Panning a camera
    - (3) Framing a shot
    - (4) Selecting an angle
    - (5) Selecting proper lighting
    - (6) Handheld shooting
  - (d) Using motion picture shooting techniques, plan ONE of the following programs. Start with a treatment and complete the requirement by presenting this program to a pack or your troop, patrol, or class.
    - (1) Film or videotape a court of honor and show it to an audience.
    - (2) Create a short feature of your own design, using the techniques you learned.
    - (3) Shoot a vignette that could be used to train a new Scout in a Scouting skill.
3. Do ONE of the following:
  - (a) With your parent's permission and your counselor's approval, visit a film set or television production studio and watch how production work is done.
  - (b) Explain to your counselor the elements of the zoom lens and three important parts.
4. Find out about three career opportunities in cinematography. Pick one and find out the education, training, and experience required for this profession. Discuss this career with your counselor. Explain why this profession might interest you.



## Citizenship in the Community

1. Discuss with your counselor what citizenship in the community means and what it takes to be a good citizen in your community. Discuss the rights, duties, and obligations of citizenship, and explain how you can demonstrate good citizenship in your community, Scouting unit, place of worship, or school.
2. Do the following:
  - (a) On a map of your community, locate and point out the following:
    - (1) Chief government buildings such as your city hall, county courthouse, and public works/services facility
    - (2) Fire station, police station, and hospital nearest your home
    - (3) Historical or other interesting points
  - (b) Chart the organization of your local or state government. Show the top offices and tell whether they are elected or appointed.
3. Do the following:
  - (a) Attend a city or town council or school board meeting, or a municipal, county, or state court session.
  - (b) Choose one of the issues discussed at the meeting where a difference of opinions was expressed, and explain to your counselor why you agree with one opinion more than you do another one.
4. Choose an issue that is important to the citizens of your community; then do the following:
  - (a) Find out which branch of local government is responsible for this issue.
  - (b) With your counselor's and a parent's approval, interview one person from the branch of government you identified in requirement 4a. Ask what is being done about this issue and how young people can help.
  - (c) Share what you have learned with your counselor.
5. With the approval of your counselor and a parent, watch a movie that shows how the actions of one individual or group of individuals can have a positive effect on a community. Discuss with your counselor what you learned from the movie about what it means to be a valuable and concerned member of the community.
6. List some of the services (such as the library, recreation center, public transportation, and public safety) your community provides that are funded by taxpayers. Tell your counselor why these services are important to your community.

7. Do the following:
    - (a) Choose a charitable organization outside of Scouting that interests you and brings people in your community together to work for the good of your community.
    - (b) Using a variety of resources (including newspapers, fliers and other literature, the Internet, volunteers, and employees of the organization), find out more about this organization.
    - (c) With your counselor's and your parent's approval, contact the organization and find out what young people can do to help. While working on this merit badge, volunteer at least eight hours of your time for the organization. After your volunteer experience is over, discuss what you have learned with your counselor.
  8. Develop a public presentation (such as a video, slide show, speech, digital presentation, or photo exhibit) about important and unique aspects of your community. Include information about the history, cultures, and ethnic groups of your community; its best features and popular places where people gather; and the challenges it faces. Stage your presentation in front of your merit badge counselor or a group, such as your patrol or a class at school.
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## **Citizenship in the Nation**

1. Explain what citizenship in the nation means and what it takes to be a good citizen of this country. Discuss the rights, duties, and obligations of a responsible and active American citizen.
2. Do TWO of the following:
  - (a) Visit a place that is listed as a National Historic Landmark or that is on the National Register of Historic Places. Tell your counselor what you learned about the landmark or site and what you found interesting about it.
  - (b) Tour your state capitol building or the U.S. Capitol. Tell your counselor what you learned about the capitol, its function, and the history.
  - (c) Tour a federal facility. Explain to your counselor what you saw there and what you learned about its function in the local community and how it serves this nation.
  - (d) Choose a national monument that interests you. Using books, brochures, the Internet (with your parent's permission), and other resources, find out more about the monument. Tell your counselor what you learned, and explain why the monument is important to this country's citizens.
3. Watch the national evening news five days in a row OR read the front page of a major daily newspaper five days in a row. Discuss the national issues you learned about with your counselor. Choose one of the issues and explain how it affects you and your family.

4. Discuss each of the following documents with your counselor. Tell your counselor how you feel life in the United States might be different without each one.
    - (a) Declaration of Independence
    - (b) Preamble to the Constitution
    - (c) The Constitution
    - (d) Bill of Rights
    - (e) Amendments to the Constitution
  5. List the six functions of government as noted in the preamble to the Constitution. Discuss with your counselor how these functions affect your family and local community.
  6. With your counselor's approval, choose a speech of national historical importance. Find out about the author, and tell your counselor about the person who gave the speech. Explain the importance of the speech at the time it was given, and tell how it applies to American citizens today. Choose a sentence or two from the speech that has significant meaning to you, and tell your counselor why.
  7. Name the three branches of our federal government and explain to your counselor their functions. Explain how citizens are involved in each branch. For each branch of government, explain the importance of the system of checks and balances.
  8. Name your two senators and the member of Congress from your congressional district. Write a letter about a national issue and send it to one of these elected officials, sharing your view with him or her. Show your letter and any response you receive to your counselor.
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## Citizenship in the World

1. Explain what citizenship in the world means to you and what you think it takes to be a good world citizen.
2. Explain how one becomes a citizen in the United States, and explain the rights, duties, and obligations of U.S. citizenship. Discuss the similarities and differences between the rights, duties, and obligations of U.S. citizens and the citizens of two other countries.
3. Do the following:
  - (a) Pick a current world event. In relation to this current event, discuss with your counselor how a country's national interest and its relationship with other countries might affect areas such as its security, its economy, its values, and the health of its citizens.
  - (b) Select a foreign country and discuss with your counselor how its geography, natural resources, and climate influence its economy and its global partnerships with other countries.



4. Do TWO of the following:
- (a) Explain international law and how it differs from national law. Explain the role of international law and how international law can be used as a tool for conflict resolution.
  - (b) Using resources such as major daily newspapers, the Internet (with your parent's permission), and news magazines, observe a current issue that involves international trade, foreign exchange, balance of payments, tariffs, and free trade. Explain what you have learned. Include in your discussion an explanation of why countries must cooperate in order for world trade and global competition to thrive.
  - (c) Select TWO of the following organizations and describe their role in the world.
    - (1) The United Nations
    - (2) The World Court
    - (3) World Organization of the Scout Movement
    - (4) The World Health Organization
    - (5) Amnesty International
    - (6) The International Committee of the Red Cross
    - (7) CARE
5. Do the following:
- (a) Discuss the differences between constitutional and nonconstitutional governments.
  - (b) Name at least five different types of governments currently in power in the world.
  - (c) Show on a world map countries that use each of these five different forms of government.
6. Do the following:
- (a) Explain how a government is represented abroad and how the United States government is accredited to international organizations.
  - (b) Describe the roles of the following in the conduct of foreign relations.
    - (1) Ambassador
    - (2) Consul
    - (3) Bureau of International Information Programs
    - (4) Agency for International Development
    - (5) United States and Foreign Commercial Service
  - (c) Explain the purpose of a passport and visa for international travel.
7. Do TWO of the following (with your parent's permission) and share with your counselor what you have learned:
- (a) Visit the Web site of the U.S. State Department. Learn more about an issue you find interesting that is discussed on this Web site.

- (b) Visit the Web site of an international news organization or foreign government, OR examine a foreign newspaper available at your local library, bookstore, or newsstand. Find a news story about a human right realized in the United States that is not recognized in another country.
- (c) Visit with a student or Scout from another country and discuss the typical values, holidays, ethnic foods, and traditions practiced or enjoyed there.
- (d) Attend a world Scout jamboree.
- (e) Participate in or attend an international event in your area, such as an ethnic festival, concert, or play.
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## Climbing

1. Do the following:
  - (a) Show that you know first aid for and how to prevent injuries or illnesses that could occur during climbing activities, including heat and cold reactions, dehydration, stopped breathing, sprains, abrasions, fractures, rope burns, blisters, snakebite, and insect bites or stings.
  - (b) Identify the conditions that must exist before performing CPR on a person.
2. Learn the Leave No Trace principles and Outdoor Code, and explain what they mean.
3. Present yourself properly dressed for belaying, climbing, and rappelling (i.e., appropriate clothing, footwear, and a helmet; rappellers and belayers must also wear gloves).
4. **Location.** Do the following:
  - (a) Explain how the difficulty of climbs is classified, and apply classifications to the rock faces or walls where you will demonstrate your climbing skills.
  - (b) Explain the following: top-rope climbing, lead climbing, and bouldering.
  - (c) Evaluate the safety of a particular climbing area. Consider weather, visibility, the condition of the climbing surface, and any other environmental hazards.
  - (d) Determine how to summon aid to the climbing area in case of an emergency.
5. **Verbal signals.** Explain the importance of using verbal signals during every climb and rappel, and while bouldering. With the help of the merit badge counselor or another Scout, demonstrate the verbal signals used by each of the following:
  - (a) Climbers
  - (b) Rappellers
  - (c) Belayers
  - (d) Boulderers and their spotters

6. **Rope.** Do the following:
  - (a) Describe the kinds of rope acceptable for use in climbing and rappelling.
  - (b) Show how to examine a rope for signs of wear or damage.
  - (c) Discuss ways to prevent a rope from being damaged.
  - (d) Explain when and how a rope should be retired.
  - (e) Properly coil a rope.
7. **Knots.** Demonstrate the ability to tie each of the following knots. Give at least one example of how each knot is used in belaying, climbing, or rappelling.
  - (a) Figure eight on a bight
  - (b) Figure eight follow-through
  - (c) Water knot
  - (d) Double fisherman's knot (grapevine knot)
  - (e) Safety knot
8. **Harnesses.** Correctly put on at least ONE of the following:
  - (a) Commercially made climbing harness
  - (b) Tied harness
9. **Belaying.** Do the following:
  - (a) Explain the importance of belaying climbers and rappellers and when it is necessary.
  - (b) Belay three different climbers ascending a rock face or climbing wall.
  - (c) Belay three different rappellers descending a rock face or climbing wall using a top rope.
10. **Climbing.** Do the following:
  - (a) Show the correct way to directly tie into a belay rope.
  - (b) Climb at least three different routes on a rock face or climbing wall, demonstrating good technique and using verbal signals with a belayer.
11. **Rappelling.** Do the following:
  - (a) Using a carabiner and a rappel device, secure your climbing harness to a rappel rope.
  - (b) Tie in to a belay rope set up to protect rappellers.
  - (c) Rappel down three different rock faces or three rappel routes on a climbing wall. Use verbal signals to communicate with a belayer, and demonstrate good rappelling technique.
12. Demonstrate ways to store rope, hardware, and other gear used for climbing, rappelling, and belaying.



## Coin Collecting

1. Understand how coins are made and where the active U.S. Mint facilities are located.
2. Explain these collecting terms:
  - (a) Obverse
  - (b) Reverse
  - (c) Reeding
  - (d) Clad
  - (e) Type set
  - (f) Date set
3. Explain the grading terms Uncirculated, Extremely Fine, Very Fine, Fine, Very Good, Good, and Poor. Show five different grade examples of the same coin type. Explain the term *proof* and why it is not a grade. Tell what encapsulated coins are.
4. Know three different ways to store a collection, and describe the benefits, drawbacks, and expense of each method. Pick one to use when completing requirements.
5. Do the following:
  - (a) Demonstrate to your counselor that you know how to use two U.S. or world coin reference catalogs.
  - (b) Read a numismatic magazine or newspaper and tell your counselor about what you learned.
6. Describe the 1999–2008 50 State Quarters® Program. Collect and show your counselor five different state quarters you have acquired from circulation.
7. Collect from circulation a set of current U.S. coins. Include one coin of each denomination (cent, nickel, dime, quarter, half dollar, dollar). For each coin, locate the mint marks, if any, and the designer's initials, if any.
8. Do the following:
  - (a) Identify the people depicted on the following denominations of current U.S. paper money: \$1, \$2, \$5, \$10, \$20, \$50, and \$100.
  - (b) Explain "legal tender."
  - (c) Describe the role the Federal Reserve System plays in the distribution of currency.

9. Do ONE of the following:
- (a) Collect and identify 50 foreign coins from at least 10 different countries.
  - (b) Collect and identify 20 bank notes from at least five different countries.
  - (c) Collect and identify 15 different tokens or medals.
  - (d) For each year since the year of your birth, collect a date set of a single type of coin.
10. Do ONE of the following:
- (a) Tour a U.S. Mint facility, a Bureau of Engraving and Printing facility, a Federal Reserve bank, or a numismatic museum or exhibit, and describe what you learned to your counselor.
  - (b) With your parent's permission, attend a coin show or coin club meeting, or view the Web site of the U.S. Mint or a coin dealer, and report what you learned.
  - (c) Give a talk about coin collecting to a group such as your troop, a Cub Scout pack, or your class at school.
  - (d) Do drawings of five Colonial-era U.S. coins.
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## Collections

1. Prepare a short written report or outline for your counselor, giving a detailed description of your collection,\* including a short history. Be sure to include why you chose that particular type of collecting and what you enjoy and have learned from your collection.
2. Explain the growth and development of your collection.
3. Demonstrate your knowledge of preserving and displaying your collection.
  - (a) Explain the precautions you need to take to preserve your collection, including
    - (1) Handling
    - (2) Cleaning
    - (3) Storage
  - (b) Explain how best to display your collection, keeping in mind preserving as discussed above.
  - (c) Explain to your counselor the events available for a hobbyist of this collection, including shows, seminars, conventions, contests, and museum programs or exhibits.

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\*Stamp and coin collecting are excluded from eligibility for this merit badge.

4. Demonstrate your knowledge of collecting and investing. Discuss with your counselor:
  - (a) How investing and speculation would apply to your collection
  - (b) What you would look for in purchasing other collections similar to yours
  - (c) What you would expect in return value if you decided to sell all or part of the collection
5. Do the following:
  - (a) Discuss with your counselor at least 10 terms commonly used in your collection and be prepared to discuss the definition of each.
  - (b) Show your counselor any two groups from your collection. Explain how you organized your collection and why you chose that method. (Note: If your collection is too large to transport and your counselor is unable to view your collection directly, photographs should be available to share.)
  - (c) Explain how your collection is valued by other collectors, and display to your counselor any price guides that may be available.
  - (d) Explain how your collection is graded for value, physical defects, size, and age. Show the various classifications or ratings used in your collection.
  - (e) List the national, state, or local association responsive to your collection.
  - (f) Show the location of and explain to your counselor the identification number (if applicable), series, brand name (if any), and any other special identification marks.
6. Discuss with your counselor the plans you have to continue with the collection in the future.
7. Discuss with your counselor why and how collecting has changed and how this applies to your collection.
8. Find out about career opportunities in collecting. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.



## Communication

1. Do ONE of the following:
  - (a) For one day, keep a log in which you describe your communication activities. Keep track of the time and different ways you spend communicating, such as talking person-to-person, listening to teachers or the radio, watching television, reading books and other print media, and using any electronic communication device. Discuss with your counselor what your log reveals about the importance of communication in your life. Think of ways to improve your communication skills.
  - (b) For three days, keep a journal of your listening experiences. Identify one example of each of the following, and discuss with your counselor when you have listened to:
    - (1) Obtain information
    - (2) A persuasive argument
    - (3) Appreciate or enjoy something
    - (4) Understand someone's feelings
  - (c) In a small-group setting, meet with other Scouts or with friends. Have them share personal stories about significant events in their lives that affected them in some way. Take note of how each Scout participates in the group discussion and how effectively he communicates his story. Report what you have learned to your counselor about the differences you observed in effective communication.
  - (d) List as many ways as you can think of to communicate with others (face-to-face, by telephone, letter, e-mail, text messages, and so on). For each type of communication, discuss with your counselor an instance when that method might not be appropriate or effective.
2. Do ONE of the following:
  - (a) Think of a creative way to describe yourself using, for example, a collage, short story or autobiography, drawing or series of photographs, or a song or skit. Using the aid you created, make a presentation to your counselor about yourself.
  - (b) Choose a concept, product, or service in which you have great confidence. Build a sales plan based on its good points. Try to persuade the counselor to agree with, use, or buy your concept, product, or service. After your sales talk, discuss with your counselor how persuasive you were.
3. Write a five-minute speech. Give it at a meeting of a group.

4. Interview someone you know fairly well, like, or respect because of his or her position, talent, career, or life experiences. Listen actively to learn as much as you can about the person. Then prepare and deliver to your counselor an introduction of the person as though this person were to be a guest speaker, and include reasons why the audience would want to hear this person speak. Show how you would call to invite this person to speak.
5. Attend a public meeting (city council, school board, debate) approved by your counselor where several points of view are given on a single issue. Practice active listening skills and take careful notes of each point of view. Present an objective report that includes all points of view that were expressed, and share this with your counselor.
6. With your counselor's approval, develop a plan to teach a skill or inform someone about something. Prepare teaching aids for your plan. Carry out your plan. With your counselor, determine whether the person has learned what you intended.
7. Do ONE of the following:
  - (a) Write to the editor of a magazine or your local newspaper to express your opinion or share information on any subject you choose. Send your message by fax, e-mail, or regular mail.
  - (b) Create a Web page or blog of special interest to you (for instance, your troop or crew, a hobby, or a sport). Include at least three articles or entries and one photograph or illustration, and one link to some other Web page or blog that would be helpful to someone who visits the Web page or blog you have created. *It is not necessary to post your Web page or blog to the Internet, but if you decide to do so, you must first share it with your parents and counselor and get their permission.*
  - (c) Use desktop publishing to produce a newsletter, brochure, flier, or other printed material for your troop or crew, class at school, or other group. Include at least one article and one photograph or illustration.
8. Plan a troop court of honor, campfire program, or an interfaith worship service. Have the patrol leaders' council approve it, then write the script and prepare the program. Serve as master of ceremonies.
9. Find out about three career opportunities in communication. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.





## Composite Materials

1. Do the following:
  - (a) Explain the precautions that must be taken when handling, storing, and disposing of resins, reinforcements, and other materials used in composites. Include in your discussion the importance of health, safety, and environmental responsibility and awareness.
  - (b) Describe what a material safety data sheet (MSDS) is and tell why it is used.
2. Do the following:
  - (a) Explain what composite materials are. Include a brief history of composites and how they have developed.
  - (b) Compare the similarities and differences between composites and wood, aluminum, copper, and steel. Describe the physical, electrical, mechanical, corrosive, flammability, cost, and other such properties. For each of these raw materials, give one example for how it can be shaped and used for a specific application.
3. Describe how composite materials are made. Then do the following:
  - (a) Discuss three different composite reinforcement materials, their positive and negative characteristics, and their uses. Obtain the MSDS for each one and discuss the toxicity, disposal, and safe-handling sections for these materials.
  - (b) Discuss three different resins used in composites, their positive and negative characteristics, and their uses. Obtain the MSDS for each one and discuss the toxicity, disposal, and safe-handling sections for these materials. Include thermoset resins and thermoplastic resins in your discussion.
  - (c) For each of the three resins you chose for requirement 3b, think of a new application that might be worth developing.
4. With your parent's permission and your counselor's approval do ONE of the following:
  - (a) Visit a company that manufactures or repairs products made with composites. Discuss what you learn with your counselor.
  - (b) Find three composites-related Web sites. Share and discuss what you learn with your counselor.
5. Do the following:
  - (a) Use composite materials to complete two projects, at least one of which must come from the *Composite Materials* merit badge pamphlet. The second project may come from the pamphlet OR may be one you select on your own that has been approved by your counselor in advance.

- (b) With your counselor's assistance, find an appropriate site where the projects can be safely completed under your counselor's supervision and/or the supervision of an adult approved by your counselor who is knowledgeable about composites.
- (c) With your counselor, determine how the finished projects will be evaluated. Using those guidelines, evaluate the completed projects with your counselor.
6. Find out about three career opportunities in composite materials. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.
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## Computers

1. Discuss with your counselor the tips for online safety.
2. Give a short history of the computer. Explain how the invention of the computer has affected society and science and technology.
3. Do the following:
  - (a) Describe four uses of computers outside your home.
  - (b) Describe three ways you and your family could use a personal computer other than for games and entertainment.
4. Explain the following to your counselor:
  - (a) The five major parts of a computer
  - (b) How text, sound, pictures, and video files are stored in a computer's memory
  - (c) How file compression works and how compression affects the quality of the file
  - (d) Describe two computer chip-based devices, and describe how they are "smarter" because of the chip and its program.
5. Do the following:
  - (a) Explain what a program or software application is and how it is developed.
  - (b) Name three programming languages and describe their uses.
  - (c) Name four software packages you or your family could use, and explain how you would use them.
  - (d) Discuss ways you can help protect a computer from viruses and how to protect the information stored on a computer.
  - (e) Describe how computers are linked to generate and access the Internet and the World Wide Web.

6. Do THREE of the following:

- (a) Using a spreadsheet program, develop a food budget for a patrol weekend campout.
- (b) Using a word processor, write a letter to the parents of your troop's Scouts, inviting them to a court of honor.
- (c) Using a computer graphics program, design and draw a campsite plan for your troop.
- (d) Using a computer graphics program, create a flier for an upcoming troop event, incorporating both text and some type of visual such as a photograph or illustration.
- (e) Using an Internet search engine (with your parent's permission), find ideas about how to conduct a troop court of honor or campfire program. Print out a copy of the ideas from at least three different Web sites. Share what you found with your counselor, and explain how you used the search engine to find this information.
- (f) Using a presentation software program of your choice, develop a report about a topic that has been approved by your counselor. For your presentation, create at least 10 slides.
- (g) Using a digital camera, take a picture of a troop activity. Transfer the picture file to a computer and use photographic software to make it small enough to send easily as an e-mail attachment. Then, using a computer connected to the Internet (with your parent's permission), send an e-mail to someone you know. In your message, include the photograph as an attachment. Verify that the person received your e-mail and was able to view the attachment.
- (h) Using a database manager, create a troop roster that includes the name, rank, patrol, and telephone number of each Scout. Show your counselor that you can sort the register by each of the following categories: rank, patrol, and alphabetically by name.

7. Do ONE of the following:

- (a) Using a database program of your choice, create a troop roster that can be sorted by the name, rank, patrol, and telephone number of each Scout. Create a form within the database manager to access each Scout's information individually. Show your counselor how the form works.
- (b) Using a software package of your choice for computer-aided design (CAD), create an engineering-style drawing of a simple object. Include the top, bottom, and at least one side view and the dimensions.
- (c) Create a blog and use it as an online journal of your Scouting activities, including group discussions and meetings, campouts, and other events. Your blog should have at least five entries and two photographs or illustrations. You need not post the blog to the Internet, but you will need to share it with your counselor. If you decide to go live with your blog, you must first share it with your parents AND counselor and get their approval.

- (d) Create a Web page for your troop, patrol, school, or place of worship. Include at least three articles and two photographs or illustrations. Your Web page should have at least one link to a Web site that would be of interest to your audience. You need not post the page to the Internet. However, if you decide to do so, you must first share it with your parents AND counselor and get their approval.
- (e) Visit a business or an industrial plant that uses computers. Observe what tasks the computers accomplish, and be prepared to discuss what you have learned.
8. Explain the following to your counselor:
- (a) Why copyright laws exist
  - (b) Why it is not permissible to accept a free copy of a paid, copyrighted computer game or program from a friend unless the game or program is considered freeware or shareware. Explain the concepts of freeware and shareware.
  - (c) The restrictions and limitations of downloading music from the Internet
9. Find out about three career opportunities in the computer industry. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you. Report what you learn to your counselor.
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## Cooking

1. Do the following:
- (a) Review with your counselor the injuries that might arise from cooking, including burns and scalds, and the proper treatment.
  - (b) Describe how meat, fish, chicken, eggs, dairy products, and fresh vegetables should be stored, transported, and properly prepared for cooking.
  - (c) Describe the following food-related illnesses and tell what you can do to help prevent each from happening:
    - (1) Salmonella enteritis
    - (2) Staphylococcal enteritis
    - (3) E. coli (Escherichia coli) enteritis
    - (4) Botulism
    - (5) Trichinosis
    - (6) Hepatitis

2. Do the following:
  - (a) Illustrate for your counselor the food pyramid that fits you. Label the following food groups in the pyramid and how much of each you should eat each day:
    - (1) Grains
    - (2) Vegetables
    - (3) Fruits
    - (4) Milk, yogurt, cheese
    - (5) Meats, poultry, fish, beans, eggs, nuts
    - (6) Oils (fats) and sugars
  - (b) Explain why you should limit your intake of oils and sugars.
  - (c) Explain the number of servings recommended per day from each group.
  - (d) Give your counselor examples from each food group.
  - (e) Describe for your counselor the measurements of servings for each food group.
  - (f) Describe to your counselor food preparation techniques that result in more healthful and nutritious meals.
3. Plan a menu for two straight days (six meals) of camping. Include the following:
  - (a) A camp dinner with soup; meat, fish, poultry, or an appropriate substitute; two fresh vegetables; drink; and dessert. All are to be properly prepared. When preparing your menu, follow the nutritional guidelines set by the food pyramid.
  - (b) A one-pot dinner. Use foods other than canned.
  - (c) Using the menu planned for requirement 3, make a food list showing cost and amount needed to feed three or more boys.
  - (d) List the utensils needed to cook and serve these meals.
4. Using the menu planned for requirement 3, do the following and discuss the process with your merit badge counselor:
  - (a) Prepare and serve for yourself and two others, the two dinners, one lunch, and one breakfast. Time your cooking so that each course will be ready to serve at the proper time.\*
  - (b) For meals prepared in requirement 4a for which a fire is needed, use a lightweight stove or build a low-impact fire. Include support for your cooking utensils from rocks, logs, or like material. The same fireplace may be used for more than one meal. Use a backpacking stove to cook at least one meal. (Where local regulations do not allow you to do this, the counselor may change the requirement to meet the law.)

\*The meals in requirements 4a and 6a may be prepared for different trips. They need not be prepared consecutively. Scouts working on this badge in summer camp should plan around food they can get at the camp commissary.

- (c) For each meal prepared in requirement 4a, use safe food-handling practices. Dispose of garbage, cans, foil, paper, and other rubbish by packing them out and depositing them in a proper container. After each meal, clean up the site thoroughly.
5. Plan a menu for one day (three meals) or for four meals over a two-day period of trail hiking or backpacking. Include the following:
- (a) A breakfast, lunch, and dinner for a trail or backpacking trip where light weight is important. You should be able to store all foods used for several days without refrigeration. When preparing your menu, follow the nutritional guidelines set by the food pyramid.
  - (b) Using the menu planned for requirement 5, make a food list showing cost and amount needed to feed three or more boys.
  - (c) List the utensils needed to cook and serve these meals.
  - (d) Figure the weight of the foods in requirement 5a.
6. Using the menu planned for requirement 5, do the following:
- (a) Prepare and serve for yourself and two others the trail breakfast and dinner. Time your cooking so that each course will be ready to serve at the proper time.\*
  - (b) Use an approved trail stove (with proper supervision) or charcoal to prepare your meals.
  - (c) For each meal prepared in requirement 6a, use safe food-handling practices. Dispose of garbage, cans, foil, paper, and other rubbish by packing them out and depositing them in a proper container. After each meal, clean up the site thoroughly.
7. Plan a menu for three full days of meals (breakfast, lunch, and dinner) to be cooked at home.
- (a) When preparing your menu, follow the nutritional guidelines set by the food pyramid. All meals are to be cooked or properly prepared.
  - (b) Using the menu planned for requirement 7, make a food list showing cost and amount needed to feed yourself and at least one adult (parent, family member, guardian, or other responsible adult).
  - (c) Tell what utensils were needed to cook and serve these meals.
  - (d) Prepare and serve a breakfast, lunch, and dinner from the menu you planned for requirement 7. Time your cooking to have each course ready to serve at the proper time. Have an adult verify the preparation of the meal to your counselor.
8. Find out about three career opportunities in cooking. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.

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\*The meals in requirements 4a and 6a may be prepared for different trips. They need not be prepared consecutively. Scouts working on this badge in summer camp should plan around food they can get at the camp commissary.



## Crime Prevention

1. Discuss the role and value of laws in society with regard to crime and crime prevention. Include in your discussion the definitions of “crime” and “crime prevention.”
2. Prepare a notebook of newspaper and other clippings that address crime and crime prevention efforts in your community.
3. Discuss the following with your counselor:
  - (a) The role of citizens, including youth, in crime prevention.
  - (b) Gangs and their impact on the community.
  - (c) When and how to report a crime.
4. After doing EACH of the following, discuss with your counselor what you have learned.
  - (a) Inspect your neighborhood for opportunities that may lead to crime. Learn how to do a crime prevention survey.
  - (b) Using the checklist in this pamphlet, conduct a security survey of your home and discuss the results with your family.
5. Teach your family or patrol members how to protect themselves from crime at home, at school, in your community, and while traveling.
6. Help raise awareness about one school safety issue facing students by doing ONE of the following:
  - (a) Create a poster for display on a school bulletin board.
  - (b) With permission from school officials, create a pagelong public service announcement that could be read over the public address system at school or posted on the school’s Web site.
  - (c) Make a presentation to a group such as a Cub Scout den that addresses the issue.
7. Do ONE of the following:
  - (a) Assist in the planning and organization of a crime prevention program in your community such as Neighborhood Watch, Community Watch, or Crime Stoppers. Explain how this program can benefit your neighborhood.
  - (b) With your parent’s and counselor’s approval, visit a jail or detention facility or a criminal court hearing. Discuss your experience with your counselor.
8. Discuss the following with your counselor:
  - (a) How drug abuse awareness programs such as “Drugs: A Deadly Game” help prevent crime.

- (b) Why alcohol, tobacco, and marijuana are sometimes called “gateway drugs” and how gateway drugs can lead to the use of other drugs.
  - (c) Three resources in your city where a person with a drug problem or drug-related problem can go for help.
  - (d) How the illegal sale and use of drugs lead to other crimes.
  - (e) How to recognize child abuse.
  - (f) The three R’s of Youth Protection.
9. Discuss the following with your counselor:
- (a) The role of a sheriff’s or police department in crime prevention.
  - (b) The purpose and operation of agencies in your community that help law enforcement personnel prevent crime, and how those agencies function during emergency situations.
  - (c) Explain the role private security plays in crime prevention.
  - (d) Choose a career in the crime prevention or security industry that interests you. Describe the level of education required and responsibilities of a person in that position. Tell why this position interests you.
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## Cycling

1. Show that you know first aid for injuries or illnesses that could occur while cycling, including hypothermia, heat reactions, frostbite, dehydration, insect stings, tick bites, snakebites, blisters, and hyperventilation.
2. Clean and adjust a bicycle. Prepare it for inspection using a bicycle safety checklist. Be sure the bicycle meets local laws.
3. Show your bicycle to your counselor for inspection. Point out the adjustments or repairs you have made. Do the following:
  - (a) Show all points that need oiling regularly.
  - (b) Show points that should be checked regularly to make sure the bicycle is safe to ride.
  - (c) Show how to adjust brakes, seat level and height, and steering tube.
4. Describe how to brake safely with foot brakes and with hand brakes.
5. Show how to repair a flat. Use an old bicycle tire.
6. Take a road test with your counselor and demonstrate the following:
  - (a) Properly mount, pedal, and brake, including emergency stops.
  - (b) On an urban street with light traffic, properly execute a left turn from the center of the street; also demonstrate an alternate left-turn technique used during periods of heavy traffic.



- (c) Properly execute a right turn.
  - (d) Demonstrate appropriate actions at a right-turn-only lane when you are continuing straight.
  - (e) Show proper curbside and road-edge riding. Show how to ride safely along a row of parked cars.
  - (f) Cross railroad tracks properly.
7. Describe your state's traffic laws for bicycles. Compare them with motor-vehicle laws. Know the bicycle safety guidelines.
  8. Avoiding main highways, take two rides of 10 miles each, two rides of 15 miles each, and two rides of 25 miles each. You must make a report of the rides taken. List dates, routes traveled, and interesting things seen.\*
  9. After fulfilling requirement 8, lay out on a road map a 50-mile trip. Stay away from main highways. Using your map, make this ride in eight hours.

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\*The bicycle must have all required safety features. It must be registered as required by your local traffic laws.

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## Dentistry

- Using x-ray (radiographic) films and with your counselor's guidance, study the tooth structure and look for decay. Then do the following:
  - Using the radiographs as a guide, draw a lower molar. Label its parts and surfaces. Show surrounding structures such as bone and gum tissues.
  - Show on your drawing where the nerves and blood vessels enter the tooth.
  - Show on your drawing where bacterial plaque is most likely to be found.
- Do the following:
  - Tell or write about what causes dental decay and gum disease. Tell how each of the following contributes to dental decay and gum disease: bacterial plaque, sugars, and acid.
  - Tell the possible causes for traumatic tooth loss, describe the types of mouth guards used to help prevent tooth trauma, and list the athletic activities during which a person should wear a mouth guard.
  - Explain the first-aid procedure for saving a tooth that has been knocked out.
  - Discuss how the use of tobacco products can negatively affect your oral health.
- Arrange for a visit with a dentist. Before you go, ask whether your visit can include a dental examination and a plaque-control demonstration. Afterward, ask questions about things you want to know. Then tell your counselor what the dentist does during a checkup examination.
- Do TWO of the following:
  - Name at least five instruments and five pieces of equipment a dentist uses.
  - With the help of a dentist, prepare a dental stone cast using a vibrator, a mixing bowl, a water measure, a plastic measure, model stone, and a spatula.
  - Keep a record of everything you eat for three days. Circle those items that may provide the sugars that bacterial plaque needs to make acid. List snacks that you should avoid to help maintain the best oral health.
- Discuss with your merit badge counselor the following:
  - How fluorides help prevent tooth decay and the ways fluorides can be provided to the teeth.
  - How the mouth is related to the rest of the body. Topics might include chewing, saliva, enzymes, nutrition, and speech.

6. Do TWO of the following:
    - (a) Make a model tooth out of soap, clay, papier-mâché, or wax. Using a string and a large hand brush, show your troop or a school class proper tooth-brushing and flossing procedures.
    - (b) Make a poster on the prevention of dental disease. Show the importance of good oral health.
    - (c) Collect at least five advertisements for different toothpastes. List the claims that each one makes. Tell about the accuracy of the advertisements.
    - (d) Write a feature story for your school newspaper on the proper care of teeth and gums. Include in your story how the use of tobacco products can negatively affect a person's oral health.
    - (e) Make drawings and write about the progress of dental decay. Describe the types of dental filling and treatments a dentist can use to repair dental decay problems.
  7. Find out about three career opportunities in dentistry. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.
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## **Disabilities Awareness**

1. Discuss with your counselor proper disability etiquette and person-first language. Explain why these are important.
2. Visit an agency that works with people with physical, mental, emotional, or educational disabilities. Collect and read information about the agency's activities. Learn about opportunities its members have for training, employment, and education.
3. Do TWO of the following:
  - (a) Talk to a Scout who has a disability and learn about his experiences taking part in Scouting activities and earning different merit badges.
  - (b) Talk to an individual who has a disability and learn about this person's experiences and the activities in which this person likes to participate.
  - (c) Learn how people with disabilities take part in a particular adaptive sport or recreational activity. Discuss what you have learned with your counselor.
  - (d) Learn about independent living aids such as service animals, canes, and teletypewriters (TTYs). Discuss with your counselor how people use such aids.

4. Visit TWO of the following locations and take notes about the accessibility to people with disabilities. In your notes, give examples of five things that could be done to improve upon the site and five things about the site that make it friendly to people with disabilities. Discuss your observations with your counselor.
  - (a) Your school
  - (b) Your place of worship
  - (c) Your Scout camping site
  - (d) A public exhibit or attraction (such as a theater, museum, or park)
5. Explain what advocacy is. Do ONE of the following advocacy activities:
  - (a) Present a counselor-approved disabilities awareness program to a Cub Scout pack or other group. During your presentation, explain and use person-first language.
  - (b) Find out about disability awareness education programs in your school or school system, or contact a disability advocacy agency. Volunteer with a program or agency for eight hours.
  - (c) Using resources such as disability advocacy agencies, government agencies, the Internet (with your parent's permission), and news magazines, learn about myths and misconceptions that influence the general public's understanding of people with disabilities. List 10 myths and misconceptions about people with disabilities and learn the facts about each myth. Share your list with your counselor, then use it to make a presentation to a Cub Scout pack or other group.
6. Make a commitment to your merit badge counselor describing what you will do to show a positive attitude about people with disabilities and to encourage positive attitudes among others. Discuss how your awareness has changed as a result of what you have learned.
7. Name five professions that provide services to people with disabilities. Pick one that interests you and find out the education, training, and experience required for this profession. Discuss what you learn with your counselor, and tell why this profession interests you.



## Dog Care

1. Do the following:
  - (a) Briefly discuss the historical origin and domestication of the dog.
  - (b) Describe some common characteristics of the dogs that make up each of the seven major dog groups.
  - (c) Tell some specific characteristics of seven breeds of dogs (one from each major group), OR give a short history of one breed.
2. Point out on a dog or a sketch at least 10 body parts. Give the correct name of each one.
3. Do the following:
  - (a) Explain the importance of house-training, obedience training, and socialization training for your dog.
  - (b) Explain what “responsible pet ownership” means.
  - (c) Explain what issues (including temperament) must be considered when deciding on what breed of dog to get as a family pet.
4. For two months, keep and care for your dog.\* Maintain a log of your activities during this period that includes these items: feeding schedule, types of food used, amount fed, exercise periods, training schedule, a weekly body weight record, grooming and bathing schedules, veterinary care, if necessary, and costs. Also include a brief description of the type of housing/shelter arrangements you have for your dog.
5. Explain the correct way to obedience train a dog and what equipment you would need. Show with your dog any three of these commands: “come,” “sit,” “down,” “heel,” “stay,” “fetch” or “get it,” and “drop it.”
6. Do the following:
  - (a) Discuss the proper vaccination schedule for a dog in your area from puppyhood through adulthood.
  - (b) Discuss the control methods for preventing fleas, ticks, heartworms, and intestinal parasites (worms) for a dog in your area from puppyhood through adulthood.
  - (c) Explain the importance of dental care and tooth brushing to your pet’s health.
  - (d) Discuss the benefits of grooming your dog’s coat and nails on a regular basis.
  - (e) Discuss with your counselor any seasonal conditions (like hot summers, cold winters, or extreme humidity) where you live that need to be considered for your dog.

\*The activities used to fulfill the requirements for the Dog Care merit badge may not be used to help fulfill requirements for other merit badges.

7. Do the following:
    - (a) Explain precautions to take in handling a hurt dog.
    - (b) Show how to put on an emergency muzzle.
    - (c) Explain how to treat wounds. Explain first aid for a dog bite.
    - (d) Show how to put on a simple dressing and bandage the foot, body, or head of your dog.
    - (e) Explain what to do if a dog is hit by a car.
    - (f) List the things needed in every dog owner's first-aid kit.
    - (g) Tell the dangers of home treatment of a serious ailment.
    - (h) Briefly discuss the cause and method of spread, the signs and symptoms and the methods of prevention of rabies, parvovirus, distemper, and heart-worms in dogs.
  8. Visit a veterinary hospital or an animal shelter and give a report about your visit to your counselor.
  9. Know the laws and ordinances involving dogs that are in force in your community.
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## Drafting

1. Format TWO sheets of drawing paper with proper borders and title blocks—one for your manual project (see requirement 2) and one for your lettering project (see requirement 5).
  - (a) Make a rough sketch for each of your project drawings to determine the correct size of paper to format.
  - (b) Using either single-stroke vertical or slant Gothic lettering, fill in all important information in the title block sections of the formatted paper.
2. Using the formatted sheet of paper you prepared for your manual project, produce a pencil drawing as it would be used for manufacturing. Fill in all title block information. The manual drawing may be any one of the following drawing types:
  - (a) **Architectural:** Make a scale drawing of an architectural project. The architectural drawing may be a floor plan; electrical, plumbing, or mechanical service plan; elevation plan; or landscaping plan. Use an architect's scale and show dimensions to communicate the actual size of features. Include any important notes and considerations necessary for construction.
  - (b) **Mechanical:** Make a scale drawing of some mechanical device or interesting object. The mechanical drawing may be of the orthographic or isometric style. Use an engineer's scale and show dimensions to communicate the actual size of features. Include any important notes and manufacturing considerations.

- (c) **Electrical:** Draw a simple schematic of a radio or electronic circuit. Properly print a bill of materials including all of the major electrical components used in the circuit. Use standard drawing symbols to represent the electronic components.
3. Produce a computer-aided design (CAD) drawing as it would be used in manufacturing. Fill in all title block information. The CAD drawing may be any one of the following drawing types:
- (a) **Architectural:** Make a scale drawing of an architectural project. The architectural drawing may be a floor plan; electrical, plumbing, or mechanical service plan; elevation plan; or landscaping plan. Use an architect's scale and show dimensions to communicate the actual size of features. Include any important notes and considerations necessary for construction.
- (b) **Mechanical:** Make a scale drawing of some mechanical device or interesting object. The mechanical drawing may be of the orthographic or isometric style. Use an engineer's scale and show dimensions to communicate the actual size of features. Include any important notes and manufacturing considerations.
- (c) **Electrical:** Draw a simple schematic of a radio or electronic circuit. Properly print a bill of materials including all of the major electrical components used in the circuit. Use standard drawing symbols to represent the electronic components.
4. Discuss with your counselor how fulfilling requirements 2 and 3 differed from each other. Tell about the benefits derived from using CAD for requirement 3. Include in your discussion the software you used as well as other software options that are available.
5. Using single-stroke slant or vertical Gothic lettering (without the aid of a template or lettering guide), write a brief explanation of what you consider to be the most important benefit in using CAD in a particular industry (aerospace, electronics, manufacturing, architectural, or other). Use the experience gained in fulfilling requirements 2, 3, and 4 to support your opinion. Use the formatted sheet of paper you prepared in requirement 1 for your lettering project.
6. Do ONE of the following (a or b):
- (a) Visit a facility or industry workplace where drafting is part of the business. Ask to see an example of the work that is done there, the different drafting facilities, and the tools used.
- (1) Find out how much of the drafting done there is manual and how much is done using CAD. If CAD is used, find out what software is used and how and why it was chosen.
- (2) Ask about the drafting services provided. Ask who uses the designs produced in the drafting area and how those designs are used. Discuss how the professionals who perform drafting cooperate with other individuals in the drafting area and other areas of the business.
- (3) Ask how important the role of drafting is to producing the end product or service that this business supplies. Find out how drafting contributes to the company's end product or service.

- (b) Using resources you find on your own such as at the library and on the Internet (with your parent's permission), learn more about the drafting trade and discuss the following with your counselor.
- (1) The drafting tools used in the past—why and how they were used. Explain which tools are still used today and how their use has changed with the advent of new tools. Discuss which tools are being made obsolete by newer tools in the industry.
  - (2) Tell what media types were used in the past and how drawings were used, stored, and reproduced. Tell how the advent of CAD has changed the media used, and discuss how these changes affect the storage or reproduction of drawings.
  - (3) Discuss whether the types of media have changed such that there are new uses—the drawings, or other outputs, produced by designers. Briefly discuss how new media types are used in the industry today.
7. Find out about three career opportunities in drafting. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.





# E



## Electricity

1. Demonstrate that you know how to respond to electrical emergencies by doing the following:
  - (a) Show how to rescue a person touching a live wire in the home.
  - (b) Show how to render first aid to a person who is unconscious from electrical shock.
  - (c) Show how to treat an electrical burn.
  - (d) Explain what to do in an electrical storm.
  - (e) Explain what to do in the event of an electrical fire.
2. Complete an electrical home safety inspection of your home, using the checklist found in the *Electricity* merit badge pamphlet or one approved by your counselor. Discuss what you find with your counselor.
3. Make a simple electromagnet and use it to show magnetic attraction and repulsion.
4. Explain the difference between direct current and alternating current.
5. Make a simple drawing to show how a battery and an electric bell work.
6. Explain why a fuse blows or a circuit breaker trips. Tell how to find a blown fuse or tripped circuit breaker in your home. Show how to safely reset the circuit breaker.
7. Explain what overloading an electric circuit means. Tell what you have done to make sure your home circuits are not overloaded.
8. On a floor plan of a room in your home, make a wiring diagram of the lights, switches, and outlets. Show which fuse or circuit breaker protects each one.
9. Do the following:
  - (a) Read an electric meter and, using your family's electric bill, determine the energy cost from the meter readings.
  - (b) Discuss with your counselor five ways in which your family can conserve energy.
10. Explain the following electrical terms: volt, ampere, watt, ohm, resistance, potential difference, rectifier, rheostat, conductor, ground, circuit, and short circuit.

11. Do any TWO of the following:
- (a) Connect a buzzer, bell, or light with a battery. Have a key or switch in the line.
  - (b) Make and run a simple electric motor (not from a kit).
  - (c) Build a simple rheostat. Show that it works.
  - (d) Build a single-pole, double-throw switch. Show that it works.
  - (e) Hook a model electric train layout to a house circuit. Tell how it works.
- 



## Electronics

1. Describe the safety precautions you must exercise when using, building, altering, or repairing electronic devices.
2. Do the following:
  - (a) Draw a simple schematic diagram. It must show resistors, capacitors, and transistors or integrated circuits. Use the correct symbols. Label all parts.
  - (b) Tell the purpose of each part.
3. Do the following:
  - (a) Show the right way to solder and desolder.
  - (b) Show how to avoid heat damage to electronic components.
  - (c) Tell about the function of a printed circuit board. Tell what precautions should be observed when soldering printed circuit boards.
4. Discuss each of the following with your merit badge counselor, and then choose ONE of the following and build a circuit to show the techniques used:
  - (a) Tell how you can use electronics for a control purpose, and then build a control device circuit.
  - (b) Tell about the basic principles of digital techniques, and then build a digital circuit. Show how to change three decimal numbers into binary numbers and three binary numbers into decimal numbers.
  - (c) Tell about three audio applications of electronics, and then build an audio circuit.

Show how to read the schematic diagram of the project you chose and, to the best of your ability, explain to your counselor how the circuit you built operates.
5. Do the following:
  - (a) Show how to solve a simple problem involving current, voltage, and resistance using Ohm's law.
  - (b) Tell about the need for and the use of test equipment in electronics. Name three types of test equipment. Tell how they operate.

6. Find out about three career opportunities in electronics that interest you. Discuss with and explain to your counselor what training and education are needed for each position.
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## Emergency Preparedness

1. Earn the First Aid merit badge.
2. Do the following:
  - (a) Discuss with your counselor the aspects of emergency preparedness:
    - (1) **Prepare** for emergency situations.
    - (2) **Respond** to emergency situations.
    - (3) **Recover** from emergency situations.
    - (4) **Mitigate and prevent** emergency situations.

Include in your discussion the kinds of questions that are important to ask yourself as you consider each of these.

- (b) Make a chart that demonstrates your understanding of each of the aspects of emergency preparedness in requirement 2a (prepare, respond, recover, mitigate) with regard to 10 of the situations listed below. **You must use situations 1, 2, 3, 4, and 5 below in boldface**, but you may choose any other five listed here for a total of 10 situations. Discuss this chart with your counselor.

- (1) **Home kitchen fire**
- (2) **Home basement/storage room/garage fire**
- (3) **Explosion in the home**
- (4) **Automobile crash**
- (5) **Food-borne disease (food poisoning)**
- (6) Fire or explosion in a public place
- (7) Vehicle stalled in the desert
- (8) Vehicle trapped in a blizzard
- (9) Flash flooding in town or in the country
- (10) Mountain/backcountry accident
- (11) Boating or water accident
- (12) Gas leak in a home or a building
- (13) Tornado or hurricane
- (14) Major flood
- (15) Nuclear power plant emergency
- (16) Avalanche (snowslide or rockslide)
- (17) Violence in a public place

- (c) Meet with and teach your family how to get or build a kit, make a plan, and be informed for the situations on the chart you created for requirement 2b. Complete a family plan. Then meet with your counselor and report on your family meeting, discuss their responses, and share your family plan.
3. Show how you could safely save a person from the following:
- (a) Touching a live household electric wire
  - (b) A room filled with carbon monoxide
  - (c) Clothes on fire
  - (d) Drowning, using nonswimming rescues (including accidents on ice)
4. Show three ways of attracting and communicating with rescue planes/aircraft.
5. With another person, show a good way to transport an injured person out of a remote and/or rugged area, conserving the energy of rescuers while ensuring the well-being and protection of the injured person.
6. Do the following:
- (a) Tell the things a group of Scouts should be prepared to do, the training they need, and the safety precautions they should take for the following emergency services:
    - (1) Crowd and traffic control
    - (2) Messenger service and communication
    - (3) Collection and distribution services
    - (4) Group feeding, shelter, and sanitation
  - (b) Identify the government or community agencies that normally handle and prepare for the emergency services listed under 6a, and explain to your counselor how a group of Scouts could volunteer to help in the event of these types of emergencies.
  - (c) Find out who is your community's emergency management director and learn what this person does to **prepare, respond to, recover from, and mitigate and prevent** emergency situations in your community. Discuss this information with your counselor, and apply what you discover to the chart you created for requirement 2b.
7. Take part in an emergency service project, either a real one or a practice drill, with a Scouting unit or a community agency.
8. Do the following:
- (a) Prepare a written plan for mobilizing your troop when needed to do emergency service. If there is already a plan, explain it. Tell your part in making it work.
  - (b) Take part in at least one troop mobilization. Before the exercise, describe your part to your counselor. Afterward, conduct an "after-action" lesson, discussing what you learned during the exercise that required changes or adjustments to the plan.

- (c) Prepare a personal emergency service pack for a mobilization call. Prepare a family emergency kit (suitcase or waterproof box) for use by your family in case an emergency evacuation is needed. Explain the needs and uses of the contents.
9. Do ONE of the following:
- (a) Using a safety checklist approved by your counselor, inspect your home for potential hazards. Explain the hazards you find and how they can be corrected.
- (b) Review or develop a plan of escape for your family in case of fire in your home.
- (c) Develop an accident prevention program for five family activities outside the home (such as taking a picnic or seeing a movie) that includes an analysis of possible hazards, a proposed plan to correct those hazards, and the reasons for the corrections you propose.
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## Energy

1. Do the following:
- (a) Find an article on the use or conservation of energy. Discuss with your counselor what in the article was interesting to you, the questions it raises, and what ideas it addresses that you do not understand.
- (b) After you have completed requirements 2 through 8, revisit the article you found for requirement 1a. Explain to your counselor what you have learned in completing the requirements that helps you better understand the article.
2. Show you understand energy forms and conversions by doing the following:
- (a) Explain how THREE of the following devices use energy, and explain their energy conversions: toaster, greenhouse, lightbulb, bow drill, nuclear reactor, sweat lodge.
- (b) Construct a system that makes at least two energy conversions and explain this to your counselor.
3. Show you understand energy efficiency by explaining to your counselor a common example of a situation where energy moves through a system to produce a useful result. Do the following:
- (a) Identify the parts of the system that are affected by the energy movement.
- (b) Name the system's primary source of energy.
- (c) Identify the useful outcomes of the system.
- (d) Identify the energy losses of the system.
4. Conduct an energy audit of your home. Keep a 14-day log that records what you and your family did to reduce energy use. Include the following in your report and, after the 14-day period, discuss what you have learned with your counselor.

- (a) List the types of energy used in your home such as electricity, wood, oil, liquid petroleum, and natural gas, and tell how each is delivered and measured, and the current cost; OR record the transportation fuel used, miles driven, miles per gallon, and trips using your family car or another vehicle.
- (b) Describe ways you and your family can use energy resources more wisely. In preparing your discussion, consider the energy required for the things you do and use on a daily basis (cooking, showering, using lights, driving, watching TV, using the computer). Explain how you can change your energy use through reuse and recycling.
5. In a notebook, identify and describe five examples of energy waste in your school or community. Suggest in each case possible ways to reduce this waste. Describe the idea of trade-offs in energy use. In your response, do the following:
- (a) Explain how the changes you suggest would lower costs, reduce pollution, or otherwise improve your community.
- (b) Explain what changes to routines, habits, or convenience are necessary to reduce energy waste. Tell why people might resist the changes you suggest.
6. Prepare pie charts showing the following information, and explain to your counselor the important ideas each chart reveals. Tell where you got your information. Explain how cost affects the use of a nonrenewable energy resource and makes alternatives practical.
- (a) The energy resources that supply the United States with most of its energy
- (b) The share of energy resources used by the United States that comes from other countries
- (c) The proportion of energy resources used by homes, businesses, industry, and transportation
- (d) The fuels used to generate America's electricity
- (e) The world's known and estimated primary energy resource reserves
7. Tell what is being done to make FIVE of the following energy systems produce more usable energy. In your explanation, describe the technology, cost, environmental impacts, and safety concerns.
- Biomass digesters or waste-to-energy plants
  - Cogeneration plants
  - Fossil fuel power plants
  - Fuel cells
  - Geothermal power plants
  - Nuclear power plants
  - Solar power systems
  - Tidal energy, wave energy, or ocean thermal energy conversion devices
  - Wind turbines
8. Find out what opportunities are available for a career in energy. Choose one position that interests you and describe the education and training required.



## Engineering

1. Select a manufactured item in your home (such as a toy or an appliance) and, under adult supervision and with the approval of your counselor, investigate how and why it works as it does. Find out what sort of engineering activities were needed to create it. Discuss with your counselor what you learned and how you got the information.
2. Select an engineering achievement that has had a major impact on society. Using resources such as the Internet (with your parent's permission), books, and magazines, find out about the engineers who made this engineering feat possible, the special obstacles they had to overcome, and how this achievement has influenced the world today. Tell your counselor what you learned.
3. Explain the work of six types of engineers. Pick two of the six and explain how their work is related.
4. Visit with an engineer (who may be your counselor or parent) and do the following:
  - (a) Discuss the work this engineer does and the tools the engineer uses.
  - (b) Discuss with the engineer a current project and the engineer's particular role in it.
  - (c) Find out how the engineer's work is done and how results are achieved.
  - (d) Ask to see the reports that the engineer writes concerning the project.
  - (e) Discuss with your counselor what you learned about engineering from this visit.
5. Do ONE of the following:
  - (a) Use the systems engineering approach to make step-by-step plans for your next campout. List alternative ideas for such items as program schedule, campsites, transportation, and costs. Tell why you made the choices you did and what improvements were made.
  - (b) Make an original design for a piece of patrol equipment. Use the systems engineering approach to help you decide how it should work and look. Draw plans for it. Show the plans to your counselor, explain why you designed it the way you did, and explain how you would make it.
6. Do TWO of the following:
  - (a) *Transforming motion.* Using common materials or a construction set, make a simple model that will demonstrate motion. Explain how the model uses basic mechanical elements like levers and inclined planes to demonstrate motion. Describe an example where this mechanism is used in a real product.
  - (b) *Using electricity.* Make a list of 10 electrical appliances in your home. Find out approximately how much electricity each uses in one month. Learn how

to find out the amount and cost of electricity used in your home during periods of light and heavy use. List five ways to conserve electricity.

(c) *Understanding electronics.* Using an electronic device such as a mobile telephone or portable digital media player, find out how sound travels from one location to another. Explain how the device was designed for ease of use, function, and durability.

(d) *Using materials.* Do experiments to show the differences in strength and heat conductivity in wood, metal, and plastic. Discuss with your counselor what you have learned.

(e) *Converting energy.* Do an experiment to show how mechanical, heat, chemical, solar, and/or electrical energy may be converted from one or more types of energy to another. Explain your results. Describe to your counselor what energy is and how energy is converted and used in your surroundings.

(f) *Moving people.* Find out the different ways people in your community get to work. Make a study of traffic flow (number of vehicles and relative speed) in both heavy and light traffic periods. Discuss with your counselor what might be improved to make it easier for people in your community to get where they need to go.

(g) *Building an engineering project.* Enter a project in a science or engineering fair or similar competition. (This requirement may be met by participation on an engineering competition project team.) Discuss with your counselor what your project demonstrates, the kinds of questions visitors to the fair asked you, and how well you were able to answer their questions.

7. Explain what it means to be a registered Professional Engineer (P.E.). Name the types of engineering work for which registration is most important.
8. Study the Engineer's Code of Ethics. Explain how it is like the Scout Oath and Scout Law.
9. Find out about three career opportunities in engineering. Pick one and research the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.



## Entrepreneurship

1. In your own words, define *entrepreneurship*. Explain to your merit badge counselor the role of the entrepreneur in the economy of the United States.
2. Identify and interview an individual who has started his or her own business. Find out how the entrepreneur got the idea for the business and how the entrepreneur recognized it as a market opportunity. Find out how the entrepreneur raised the capital (money) to start the business. How well is the business doing? Report what you learn.



3. Do the following:
  - (a) Write down as many ideas as you can think of for a business. Get ideas from your family and friends. From your list, select three ideas that you believe are the best opportunities for you.
  - (b) Explain to your counselor why you chose these three ideas rather than the others on your list.
  - (c) For each of the three ideas that you chose, prepare a list of questions that you would ask potential customers.
  - (d) For each of your three ideas, informally interview potential customers, using the lists of questions from requirement 3c. Report what you learn.
  - (e) Using the information you have gathered, choose the one idea that you feel is your best business opportunity.
4. Conduct a feasibility study of your business idea by doing all of the following (briefly writing or explaining each item to your counselor):
  - (a) *Product or Service*
    - (1) Identify your business goals.
    - (2) Tell how you will make the product or perform the service. Determine whether it is technically feasible (practical or doable).
    - (3) Determine how you can make enough of the product or provide enough of the service to meet your business goals. Explain how you will accomplish this.
    - (4) Identify and describe the potential liability risks of your product or service.
    - (5) Determine what type of license you might need in order to sell or to make your product or service.
  - (b) *Market*
    - (1) Determine who your customers are. Identify the type of person who would buy your product or service.
    - (2) Describe the unique benefits of your product or service.
    - (3) Tell how you will promote and sell your product or service to potential customers.
  - (c) *Finances*
    - (1) If you are selling a product, determine how much it will cost to make one prototype.
    - (2) Calculate the selling price of your product or service. Explain how you determined the price.
    - (3) Tell how you will sell your product or service and make a profit.
    - (4) Determine how much money you will need to start your business. Explain how you will get the money.
  - (d) *Personnel*
    - (1) Determine what parts of the business you will handle yourself. Describe your qualifications for the work. Determine how your business responsibilities will fit into your schedule.

- (2) Determine whether you will need additional help to operate your business. If you will need help, describe the qualifications your helpers should have and what duties they will perform.
5. Do TWO of the following:
- (a) Sketch a prototype of your product or write a description of your service.
  - (b) Create the prototype. List all of the materials you used to make your prototype. Calculate the cost of all the materials and labor to compute the total cost of making your prototype.
  - (c) Design a promotional poster or flier for your product or service.
  - (d) Project (estimate) your sales through the first three months of operation. Calculate the profit you expect to make.
6. When you believe that your business idea is feasible, start your business. Show evidence that you started your business (sales receipts, for example, or photos of the product). Discuss with your counselor any ethical questions you have faced or think you may face in your business venture.
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## Environmental Science

1. Make a time line of the history of environmental science in America. Identify the contribution made by the Boy Scouts of America to environmental science. Include dates, names of people or organizations, and important events.
2. Define the following terms: population, community, ecosystem, biosphere, symbiosis, niche, habitat, conservation, threatened species, endangered species, extinction, pollution prevention, brownfield, ozone, watershed, airshed, nonpoint source, hybrid vehicle, fuel cell.
3. Do ONE activity from EACH of the following categories (using the activities in this pamphlet as the basis for planning and projects):
  - (a) Ecology
    - (1) Conduct an experiment to find out how living things respond to changes in their environments. Discuss your observations with your counselor.
    - (2) Conduct an experiment illustrating the greenhouse effect. Keep a journal of your data and observations. Discuss your conclusions with your counselor.
    - (3) Discuss what is an ecosystem. Tell how it is maintained in nature and how it survives.
  - (b) Air Pollution
    - (1) Perform an experiment to test for particulates that contribute to air pollution. Discuss your findings with your counselor.

- (2) Record the trips taken, mileage, and fuel consumption of a family car for seven days, and calculate how many miles per gallon the car gets. Determine whether any trips could have been combined (“chained”) rather than taken out and back. Using the idea of trip chaining, determine how many miles and gallons of gas could have been saved in those seven days.
- (3) Explain what is acid rain. In your explanation, tell how it affects plants and the environment and the steps society can take to help reduce its effects.
- (c) Water Pollution
- (1) Conduct an experiment to show how living things react to thermal pollution. Discuss your observations with your counselor.
- (2) Conduct an experiment to identify the methods that could be used to mediate (reduce) the effects of an oil spill on waterfowl. Discuss your results with your counselor.
- (3) Describe the impact of a waterborne pollutant on an aquatic community. Write a 100-word report on how that pollutant affected aquatic life, what the effect was, and whether the effect is linked to biomagnification.
- (d) Land Pollution
- (1) Conduct an experiment to illustrate soil erosion by water. Take photographs or make a drawing of the soil before and after your experiment, and make a poster showing your results. Present your poster to your counselor.
- (2) Perform an experiment to determine the effect of an oil spill on land. Discuss your conclusions with your counselor.
- (3) Photograph an area affected by erosion. Share your photographs with your counselor and discuss why the area has eroded and what might be done to help alleviate the erosion.
- (e) Endangered Species
- (1) Do research on one endangered species found in your state. Find out what its natural habitat is, why it is endangered, what is being done to preserve it, and how many individual organisms are left in the wild. Prepare a 100-word report about the organism, including a drawing. Present your report to your patrol or troop.
- (2) Do research on one species that was endangered or threatened but which has now recovered. Find out how the organism recovered, and what its new status is. Write a 100-word report on the species and discuss it with your counselor.
- (3) With your parent’s and counselor’s approval, work with a natural resource professional to identify two projects that have been approved to improve the habitat for a threatened or endangered species in your area. Visit the site of one of these projects and report on what you saw.
- (f) Pollution Prevention, Resource Recovery, and Conservation
- (1) Look around your home and determine 10 ways your family can help reduce pollution. Practice at least two of these methods for seven days and discuss with your counselor what you have learned.

- (2) Determine 10 ways to conserve resources or use resources more efficiently in your home, at school, or at camp. Practice at least two of these methods for seven days and discuss with your counselor what you have learned.
- (3) Perform an experiment on packaging materials to find out which ones are biodegradable. Discuss your conclusion with your counselor.
4. Choose two outdoor study areas that are very different from one another (e.g., hilltop vs. bottom of a hill; field vs. forest; swamp vs. dry land). For BOTH study areas, do ONE of the following:
- (a) Mark off a plot of 4 square yards in each study area, and count the number of species found there. Estimate how much space is occupied by each plant species and the type and number of nonplant species you find. Write a report that adequately discusses the biodiversity and population density of these study areas. Discuss your report with your counselor.
- (b) Make at least three visits to each of the two study areas (for a total of six visits), staying for at least 20 minutes each time, to observe the living and non-living parts of the ecosystem. Space each visit far enough apart that there are readily apparent differences in the observations. Keep a journal that includes the differences you observe. Then, write a short report that adequately addresses your observations, including how the differences of the study areas might relate to the differences noted, and discuss this with your counselor.
5. Using the construction project provided or a plan you create on your own, identify the items that would need to be included in an environmental impact statement for the project planned.
6. Find out about three career opportunities in environmental science. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.



# F



## Family Life

1. Prepare an outline on what a family is and discuss this with your merit badge counselor. Tell why families are important to individuals and to society. Discuss how the actions of one member can affect other members.
2. List several reasons why you are important to your family and discuss this with your parents or guardians and with your merit badge counselor.
3. Prepare a list of your regular home duties or chores (at least five) and do them for 90 days. Keep a record of how often you do each of them.
4. With the approval of your parents or guardians and your merit badge counselor, decide on and carry out a project that you would do around the home that would benefit your family. Submit a report to your merit badge counselor outlining how the project benefited your family.
5. Plan and carry out a project that involves the participation of your family. After completing the project, discuss the following with your merit badge counselor:
  - (a) The objective or goal of the project
  - (b) How individual members of your family participated
  - (c) The results of the project
6. Do the following:
  - (a) Discuss with your merit badge counselor how to plan and carry out a family meeting.
  - (b) After this discussion, plan and carry out a family meeting to include the following subjects:
    - (1) Avoiding substance abuse, including tobacco, alcohol, and drugs, all of which negatively affect your health and well-being
    - (2) Understanding the growing-up process and how the body changes, and making responsible decisions dealing with sex
    - (3) Personal and family finances
    - (4) A crisis situation within your family
    - (5) The effect of technology on your family
    - (6) Good etiquette and manners

Discussion of each of these subjects will very likely carry over to more than one family meeting.

7. Discuss the following with your counselor:
    - (a) Your understanding of what makes an effective father and why, and your thoughts on the father's role in the family
    - (b) Your understanding of the responsibilities of a parent
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## Farm Mechanics

1. Do the following:
  - (a) Discuss with your counselor the safety equipment, tools, and clothing used while checking or repairing farm equipment. Use this equipment, tools, and/or clothing (when needed or called for) in meeting the requirements for this merit badge.
  - (b) Draw a plan showing a well-equipped farm shop. Point out the shop's mandatory safety devices and features.
  - (c) Find all the universal warning and safety symbols on a piece of equipment and explain what they mean.
  - (d) Describe what a material safety data sheet (MSDS) is and tell why it is used. Obtain the MSDS for any engine coolant, oil, grease, fuel, hydraulic or transmission fluid, or other flammable or hazardous materials you use in meeting the requirements for this merit badge.
2. Explain how power is produced or transferred in a:
  - (a) Diesel engine
  - (b) Hydraulic system
  - (c) Transmission or any other power system
3. Do TWO of the following:
  - (a) Replace the handle of any tool found on the farm.
  - (b) Organize a tool rack or a storage system for nails, bolts, nuts, and washers.
  - (c) Using a hand file, properly dress the mushroomed head of a chisel or punch.
  - (d) Using a hand file, correctly dress a screwdriver tip.
4. Do ONE of the following:
  - (a) On an engine-powered machine: Grease all fittings, change the oil and oil filter, clean the air filter, clean the radiator fins, and replace the fuel filters.

- (b) For any engine-powered machine, create a preoperational checklist; include checking the engine coolant, engine oil, hydraulic and/or transmission fluid, and battery voltage (using a voltmeter). Using your checklist, conduct a preoperational check of that machinery or equipment.
- (c) Prepare any farm machine for winter storage.
5. Visit an implement dealer. Interview the dealer technician or service manager for hints on good preventive maintenance. Ask why it is important, the costs, and what causes wear or damage. Report what you learn.
  6. Explain each step in ONE of the following maintenance procedures:
    - (a) Tightening hydraulic fittings
    - (b) Checking the air filter
    - (c) Cleaning a work piece with a wire-brush wheel
  7. Find out about three career opportunities in farm mechanics. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.
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## Fingerprinting

1. Give a short history of fingerprinting. Tell the difference between civil and criminal identification.
2. Explain the difference between the automated fingerprint identification systems (AFIS) now used by some law enforcement agencies and the biometric fingerprint systems used to control access to places like buildings, airports, and computer rooms.
3. Do the following:
  - (a) Name the surfaces of the body where friction or papillary ridges are found.
  - (b) Name the two basic principles supporting the science of fingerprints and give a brief explanation of each principle.
  - (c) Explain what it takes to positively identify a person using fingerprints.
4. Take a clear set of prints using ONE of the following methods.
  - (a) Make both rolled and plain impressions. Make these on an 8-by-8-inch fingerprint identification card, available from your local police department or your counselor.
  - (b) Using clear adhesive tape, a pencil, and plain paper, record your own fingerprints or those of another person.
5. Show your merit badge counselor you can identify the three basic types of fingerprint patterns and their subcategories. Using your own hand, identify the types of patterns you see.



## Fire Safety

1. Do the following:
  - (a) Demonstrate the technique of stop, drop, roll, and cool. Explain how burn injuries can be prevented.
  - (b) List the most frequent causes of burn injuries.
2. Explain the chemistry and physics of fire. Name the parts of the fire tetrahedron. Explain why vapors are important to the burning process. Name the products of combustion. Give an example of how fire grows and what happens.
3. Name the most frequent causes of fire in the home and give examples of ways they can be prevented. Include a discussion about fires caused by smoking in the home, cooking, candles, fireplaces, and electrical appliances.
4. Do the following:
  - (a) Explain the role of human behavior in the arson problem in this country.
  - (b) List the actions that cause seasonal fires and explain how these fires can be prevented.
5. List the common circumstances that cause holiday-related fires and explain how these fires can be prevented.
6. Conduct a home safety survey with the help of an adult. Then do the following:
  - (a) Draw a home fire-escape plan, create a home fire-drill schedule, and conduct a home fire drill.
  - (b) Test a smoke alarm and demonstrate regular maintenance of a smoke alarm.
  - (c) Explain what to do when you smell gas and when you smell smoke.
  - (d) Explain how you would report a fire alarm.
  - (e) Explain what fire safety equipment can be found in public buildings.
  - (f) Explain who should use fire extinguishers and when these devices can be used.
  - (g) Explain how to extinguish a grease pan fire.
  - (h) Explain what fire safety precautions you should take when you are in a public building.
7. Do the following:
  - (a) Demonstrate lighting a match safely.
  - (b) Demonstrate the safe way to start a charcoal fire.
  - (c) Demonstrate the safe way to melt wax.



8. Explain the difference between combustible and noncombustible liquids and between combustible and noncombustible fabrics.
  9. Do the following:
    - (a) Demonstrate the safe way to fuel a lawn mower.
    - (b) Demonstrate the safety factors, such as proper ventilation, for auxiliary heating devices and the proper way to fuel those devices.
  10. Do the following:
    - (a) Explain the cost of outdoor and wildland fires and how to prevent them.
    - (b) Demonstrate setting up and putting out a cooking fire.
    - (c) Demonstrate using a camp stove and lantern.
    - (d) Explain how to set up a campsite safe from fire.
  11. Visit a fire station. Identify the types of fire trucks. Find out about the fire prevention activities in your community.
  12. Choose a fire safety-related career that interests you and describe the level of education required and responsibilities of a person in that position. Tell why this position interests you.
- 



## **First Aid**

1. Satisfy your counselor that you have current knowledge of all first-aid requirements for Tenderfoot, Second Class, and First Class ranks.
2. Do the following:
  - (a) Explain how you would obtain emergency medical assistance from your home, on a wilderness camping trip, and during an activity on open water.
  - (b) Explain the term *triage*.
  - (c) Explain the standard precautions as applied to bloodborne pathogens.
  - (d) Prepare a first-aid kit for your home. Display and discuss its contents with your counselor.
3. Do the following:
  - (a) Explain what action you should take for someone who shows signals of shock, for someone who shows signals of a heart attack, and for someone who shows signals of stroke.
  - (b) Identify the conditions that must exist before performing CPR on a person. Then demonstrate proper technique in performing CPR using a training device approved by your counselor.
  - (c) Explain the use of an automated external defibrillator (AED).
  - (d) Show the steps that need to be taken for someone suffering from a severe cut on the leg and on the wrist. Tell the dangers in the use of a tourniquet and the conditions under which its use is justified.

- (e) Explain when a bee sting could be life threatening and what action should be taken for prevention and for first aid.
- (f) Explain the symptoms of heatstroke and what action should be taken for first aid and for prevention.
4. Do the following:
- (a) Describe the signals of a broken bone. Show first-aid procedures for handling fractures (broken bones), including open (compound) fractures of the forearm, wrist, upper leg, and lower leg using improvised materials.
  - (b) Describe the symptoms and possible complications and demonstrate proper procedures for treating suspected injuries to the head, neck, and back. Explain what measures should be taken to reduce the possibility of further complicating these injuries.
5. Describe the symptoms, proper first-aid procedures, and possible prevention measures for the following conditions:
- (a) Hypothermia
  - (b) Convulsions/seizures
  - (c) Frostbite
  - (d) Dehydration
  - (e) Bruises, strains, sprains
  - (f) Burns
  - (g) Abdominal pain
  - (h) Broken, chipped, or loosened tooth
  - (i) Knocked out tooth
  - (j) Muscle cramps
6. Do TWO of the following:
- (a) If a sick or an injured person must be moved, tell how you would determine the best method. Demonstrate this method.
  - (b) With helpers under your supervision, improvise a stretcher and move a presumably unconscious person.
  - (c) With your counselor's approval, arrange a visit with your patrol or troop to an emergency medical facility or through an American Red Cross chapter for a demonstration of how an AED is used.
7. Teach another Scout a first-aid skill selected by your counselor.



## Fish and Wildlife Management

1. Describe the meaning and purposes of fish and wildlife conservation and management.
2. List and discuss at least three major problems that continue to threaten your state's fish and wildlife resources.
3. Describe some practical ways in which everyone can help with the fish and wildlife conservation effort.
4. List and describe five major fish and wildlife management practices used by managers in your state.
5. Do ONE of the following:
  - (a) Construct, erect, and check regularly at least two artificial nest boxes (wood duck, bluebird, squirrel, etc.) and keep written records for one nesting season.
  - (b) Construct, erect, and check regularly bird feeders and keep written records of the kinds of birds visiting the feeders in the winter.
  - (c) Design and implement a backyard wildlife habitat improvement project and report the results.
  - (d) Design and construct a wildlife blind near a game trail, water hole, salt lick, bird feeder, or birdbath and take good photographs or make sketches from the blind of any combination of 10 wild birds, mammals, reptiles, or amphibians.
6. Do ONE of the following:
  - (a) Observe and record 25 species of wildlife. Your list may include mammals, birds, reptiles, amphibians, and fish. Write down when and where each animal was seen.
  - (b) List the wildlife species in your state that are classified as endangered, threatened, exotic, game species, furbearers, or migratory game birds.
  - (c) Start a scrapbook of North American wildlife. Insert markers to divide the book into separate parts for mammals, birds, reptiles, amphibians, and fish. Collect articles on such subjects as life histories, habitat, behavior, and feeding habits on all of the five categories and place them in your notebook accordingly. Articles and pictures may be taken from newspapers or science, nature, and outdoor magazines, or from other sources including the Internet (with your parent's permission). Enter at least five articles on mammals, five on birds, five on reptiles, five on amphibians, and five on fish. Put each animal on a separate sheet in alphabetical order. Include pictures whenever possible.
7. Do ONE of the following:
  - (a) Determine the age of five species of fish from scale samples or identify various age classes of one species in a lake and report the results.
  - (b) Conduct a creel census on a small lake to estimate catch per unit effort.

(c) Examine the stomach contents of three species of fish and record the findings. It is not necessary to catch any fish for this option. You must visit a cleaning station set up for fishermen or find another, similar alternative.

(d) Make a freshwater aquarium. Include at least four species of native plants and four species of animal life, such as whirligig beetles, freshwater shrimp, tadpoles, water snails, and golden shiners. After 60 days of observation, discuss with your counselor the life cycles, food chains, and management needs you have recognized. After completing requirement 7d to your counselor's satisfaction, with your counselor's assistance, check local laws to determine what you should do with the specimens you have collected.

8. Using resources found at the library and in periodicals, books, and the Internet (with your parent's permission), learn about three different kinds of work done by fish and wildlife managers. Find out the education and training requirements for each position.
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## Fishing

- Do the following:
  - Discuss the prevention of and treatment for the following health concerns that could occur while fishing, including cuts and scratches, puncture wounds, insect bites, hypothermia, dehydration, heat exhaustion, heatstroke, and sunburn.
  - Explain how to remove a hook that has lodged in your arm.
  - Name and explain five safety practices you should always follow while fishing.
- Discuss the differences between two types of fishing outfits. Point out and identify the parts of several types of rods and reels. Explain how and when each would be used. Review with your counselor how to care for this equipment.
- Demonstrate the proper use of two different types of fishing equipment.
- Demonstrate how to tie the following knots: clinch, Palomar, turtle, blood loop (barrel knot), and double surgeon's loop. Explain how and when each knot is used.
- Name and identify five basic artificial lures and five natural baits and explain how to fish with them. Explain why baitfish are not to be released.
- Do the following:
  - Explain the importance of practicing Leave No Trace techniques. Discuss the positive effects of Leave No Trace on fishing resources.
  - Discuss the meaning and importance of catch and release. Describe how to properly release a fish safely to the water.
- Obtain and review the regulations affecting game fishing where you live. Explain why they were adopted and what is accomplished by following them.
- Explain what good outdoor sportsmanlike behavior is and how it relates to anglers. Tell how the Outdoor Code of the Boy Scouts of America relates to a

fishing sports enthusiast, including the aspects of littering, trespassing, courteous behavior, and obeying fishing regulations.

9. Catch at least one fish. If regulations and health concerns permit, clean and cook a fish you have caught. Otherwise, acquire a fish and cook it.
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## Fly-Fishing

1. Do the following:
  - (a) Discuss the prevention of and treatment for health concerns that could occur while fly-fishing, including cuts and scratches, puncture wounds, insect bites, hypothermia, dehydration, heat exhaustion, heatstroke, and sunburn.
  - (b) Explain how to remove a hook that has lodged in your arm.
  - (c) Name and explain five safety practices you should always follow while fly-fishing.
2. Demonstrate how to match a fly rod, line, and leader to achieve a balanced system. Discuss several types of fly lines, and explain how and when each would be used. Review with your counselor how to care for this equipment.
3. Demonstrate how to tie proper knots to prepare a fly rod for fishing:
  - (a) Tie a backing to a fly reel spool using the arbor knot.
  - (b) Attach backing to fly line using the nail knot.
  - (c) Attach a leader to fly line using the needle knot, nail knot, or a loop-to-loop connection.
  - (d) Add a tippet to a leader using a loop-to-loop connection or blood knot.
  - (e) Tie a fly onto the terminal end of the leader using the improved clinch knot.
4. Explain how and when each of the following types of flies is used: dry flies, wet flies, nymphs, streamers, bass bugs, poppers, and saltwater flies. Tell what each one imitates. Tie at least two types of the flies mentioned in this requirement.
5. Demonstrate the ability to cast a fly 30 feet consistently and accurately using both overhead and roll cast techniques.
6. Go to a suitable fishing location and observe what fish may be eating both above and beneath the water's surface. Explain the importance of matching the hatch.
7. Do the following:
  - (a) Explain the importance of practicing Leave No Trace techniques. Discuss the positive effects of Leave No Trace on fly-fishing resources.
  - (b) Discuss the meaning and importance of catch and release. Describe how to properly release a fish safely to the water.
8. Obtain and review a copy of the regulations affecting game fishing where you live or where you plan to fish. Explain why they were adopted and what is accomplished by following them.

9. Discuss what good outdoor sportsmanlike behavior is and how it relates to anglers. Tell how the Outdoor Code of the Boy Scouts of America relates to a fishing enthusiast, including the aspects of littering, trespassing, courteous behavior, and obeying fishing regulations.
  10. Catch at least one fish and identify it. If local fishing and health regulations allow, clean and cook a fish you have caught. Otherwise, acquire a fish and cook it.
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## Forestry

1. Prepare a field notebook, make a collection, and identify 15 species of trees, wild shrubs, or vines in a local forested area. Write a description in which you identify and discuss the following:
  - (a) The characteristics of leaf, twig, cone, or fruiting bodies
  - (b) The habitat in which these trees, shrubs, or vines are found
  - (c) The important ways each tree, shrub, or vine is used by humans or wildlife and whether the species is native or was introduced to the area. If it is not native, explain whether it is considered invasive or potentially invasive.
2. Do ONE of the following:
  - (a) Collect and identify wood samples of 10 species of trees. List several ways the wood of each species can be used.
  - (b) Find and examine three stumps, logs, or core samples that show variations in the growth rate of their ring patterns. In the field notebook you prepared for requirement 1, describe the location or origin of each example (including elevation, aspect, slope, and the position on the slope), and discuss possible reasons for the variations in growth rate. Photograph or sketch each example.
  - (c) Find and examine two types of animal, insect, or damage on trees. In the field notebook you prepared for requirement 1, identify the damage, explain how the damage was caused, and describe the effects of the damage on the trees. Photograph or sketch each example.
3. Do the following:
  - (a) Describe the contributions forests make to:
    - (1) Our economy in the form of products
    - (2) Our social well-being, including recreation
    - (3) Soil protection and increased fertility
    - (4) Clean water
    - (5) Clean air (carbon cycling, sequestration)
    - (6) Wildlife habitat
    - (7) Fisheries habitat
    - (8) Threatened and endangered species of plants and animals

- (b) Tell which watershed or other source your community relies on for its water supply.
4. Describe what forest management means, including the following:
- (a) Multiple-use management
  - (b) Sustainable forest management
  - (c) Even-aged and uneven-aged management and the silvicultural systems associated with each
  - (d) Intermediate cuttings
  - (e) The role of prescribed burning and related forest-management practices
5. With your parent's and counselor's approval, do ONE of the following:
- (a) Visit a managed public or private forest area with the manager or a forester who is familiar with it. Write a brief report describing the type of forest, the management objectives, and the forestry techniques used to achieve the objectives.
  - (b) With a knowledgeable individual, visit a logging operation or wood-using manufacturing plant. Write a brief report describing the following:
    - (1) The species and size of trees being harvested or used and the location of the harvest area or manufacturer
    - (2) The origin of the forest or stands of trees being utilized (e.g., planted or natural)
    - (3) The forest's successional stage. What is its future?
    - (4) Where the trees are coming from (land ownership) or where they are going (type of mill or processing plant)
    - (5) The products that are made from the trees
    - (6) How the products are made and used
    - (7) How waste materials from the logging operation or manufacturing plant are disposed of or utilized
  - (c) Take part in a forest-fire prevention campaign in cooperation with your local fire warden, state wildfire agency, forester, or counselor. Write a brief report describing the campaign, how it will help prevent wildfires, and your part in it.
6. Do the following:
- (a) Describe the consequences to forests that result from FIVE of the following elements: wildfire, absence of fire, insects, tree diseases, air pollution, overgrazing, deer or other wildlife overpopulation, improper harvest, and urbanization.
  - (b) Explain what can be done to reduce the consequences you discussed in 6a.
  - (c) Describe what you should do if you discover a forest fire and how a professional firefighting crew might control it. Name your state or local wildfire control agency.
7. Visit one or more local foresters and write a brief report about the person (or persons). Or, write about a forester's occupation including the education, qualifications, career opportunities, and duties related to forestry.

# C



## Gardening

1. Do the following:
  - (a) Grow six vegetables, three from seeds and three from seedlings, through harvest.
  - (b) Grow six flowers, three from seeds and three from seedlings, through flowering.
2. Give the food value of the following:
  - (a) Three root or tuber crops
  - (b) Three vegetables that bear above the ground
  - (c) Three fruits
3. Test 100 seeds for germination. Determine the percentage of seeds that germinate. Explain why you think some did not germinate.
4. Visit your county extension agent's office, local university agricultural college, nursery, or a botanical garden or arboretum. Report on what you learned.
5. Identify five garden pests (insects, diseased plants). Recommend two solutions for each pest. At least one of the two solutions must be an organic method.
6. Do ONE of the following:
  - (a) Build a compost bin and maintain it for 90 days.
  - (b) Build a vermipost bin (worm compost bin) and maintain it for 90 days.
  - (c) Build a hydroponic garden containing three vegetables or herbs, or three ornamental plants. Maintain this garden through harvest or flowering, or for 90 days.
  - (d) Build one water garden, either in a container (at least 12 by 6 inches and 6 inches deep), or in the ground as a small, decorative pond no larger than 6 by 3 feet and 24 inches deep. Maintain the water garden for 90 days.





## Genealogy

1. Explain to your counselor what the words *genealogy*, *ancestor*, and *descendant* mean.
2. Do ONE of the following:
  - (a) Create a time line for yourself or for a relative. Then write a short biography based on that time line.
  - (b) Keep a journal for six weeks. You must write in it at least once a week.
3. With your parent's help, choose a relative or a family acquaintance you can interview in person, by telephone, or by e-mail or letter. Record the information you collect so you do not forget it.
4. Do the following:
  - (a) Name three types of genealogical resources and explain how these resources can help you chart your family tree.
  - (b) Obtain at least one genealogical document that supports an event that is or can be recorded on your pedigree chart or family group record. The document could be found at home or at a government office, religious organization, archive, or library.
  - (c) Tell how you would evaluate the genealogical information you found for requirement 4b.
5. Contact ONE of the following individuals or institutions. Ask what genealogical services, records, or activities this individual or institution provides, and report the results:
  - (a) A genealogical or lineage society
  - (b) A professional genealogist (someone who gets paid for doing genealogical research)
  - (c) A surname organization, such as your family's organization
  - (d) A genealogical educational facility or institution
  - (e) A genealogical record repository of any type (courthouse, genealogical library, state or national archive, state library, etc.)
6. Begin your family tree by listing yourself and include at least two additional generations. You may complete this requirement by using the chart provided in the *Genealogy* merit badge pamphlet or the genealogy software program of your choice.
7. Complete a family group record form, listing yourself and your brothers and sisters as the children. On another family group record form, show one of your parents and his or her brothers and sisters as the children. This requirement may be completed using the chart provided or the genealogy software program of your choice.

8. Do the following:
    - (a) Explain the effect computers and the Internet are having on the world of genealogy.
    - (b) Explain how photography (including microfilming) has influenced genealogy.
  9. Discuss what you have learned about your family and your family members through your genealogical research.
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## Geocaching

1. Do the following:
  - (a) Explain to your counselor the most likely hazards you may encounter while participating in geocaching activities, and what you should do to anticipate, help prevent, mitigate, and respond to these hazards.
  - (b) Discuss first aid and prevention for the types of injuries or illnesses that could occur while participating in geocaching activities, including cuts, scrapes, snakebite, insect stings, tick bites, exposure to poisonous plants, heat and cold reactions (sunburn, heatstroke, heat exhaustion, hypothermia), and dehydration.
  - (c) Discuss how to properly plan an activity that uses GPS, including using the buddy system, sharing your plan with others, and considering the weather, route, and proper attire.
2. Discuss the following with your counselor:
  - (a) Why you should never bury a cache
  - (b) How to use proper geocaching etiquette when hiding or seeking a cache, and how to properly hide, post, maintain, and dismantle a geocache
  - (c) The principles of Leave No Trace as they apply to geocaching
3. Explain the following terms used in geocaching: waypoint, log, cache, accuracy, difficulty and terrain ratings, attributes, trackable. Choose five additional terms to explain to your counselor.
4. Explain how the Global Positioning System (GPS) works. Then, using Scouting's Teaching EDGE, demonstrate to your counselor the use of a GPS unit. Include marking and editing a waypoint, changing field functions, and changing the coordinate system in the unit.
5. Do the following:
  - (a) Show you know how to use a map and compass and explain why this is important for geocaching.
  - (b) Explain the similarities and differences between GPS navigation and standard map-reading skills and describe the benefits of each.
  - (c) Explain the UTM (Universal Transverse Mercator) system and how it differs from the latitude/longitude system used for public geocaches.

- (d) Show how to plot a UTM waypoint on a map. Compare the accuracy to that found with a GPS unit.
6. Describe to your counselor the four steps to finding your first cache. Then mark and edit a waypoint.
  7. With your parent's permission\*, go to [www.geocaching.com](http://www.geocaching.com). Type in your zip code to locate public geocaches in your area. Share with your counselor the posted information about three of those geocaches. Then, pick one of the three and find the cache.
  8. Do ONE of the following:
    - (a) If a Cache to Eagle® series exists in your council, visit at least three of the locations in the series. Describe the projects that each cache you visit highlights, and explain how the Cache to Eagle® program helps share our Scouting service with the public.
    - (b) Create a Scouting-related Travel Bug® that promotes one of the values of Scouting. "Release" your Travel Bug into a public geocache and, with your parent's permission, monitor its progress at [www.geocaching.com](http://www.geocaching.com) for 30 days. Keep a log, and share this with your counselor at the end of the 30-day period.
    - (c) Set up and hide a public geocache, following the guidelines in the *Geocaching* merit badge pamphlet. Before doing so, share with your counselor a six-month maintenance plan for the geocache where you are personally responsible for the first three months. After setting up the geocache, with your parent's permission, follow the logs online for 30 days and share them with your counselor.
    - (d) Explain what Cache In Trash Out (CITO) means, and describe how you have practiced CITO at public geocaches or at a CITO event. Then, either create CITO containers to leave at public caches, or host a CITO event for your unit or for the public.
  9. Plan a geohunt for a youth group such as your troop or a neighboring pack, at school, or your place of worship. Choose a theme, set up a course with at least four waypoints, teach the players how to use a GPS unit, and play the game. Tell your counselor about your experience, and share the materials you used and developed for this event.

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\*To fulfill this requirement, you will need to set up a free user account with [www.geocaching.com](http://www.geocaching.com). Before doing so, ask your parent for permission and help.



## Geology

1. Define geology. Discuss how geologists learn about rock formations. In geology, explain why the study of the present is important to understanding the past.
2. Pick three resources that can be extracted or mined from Earth for commercial use. Discuss with your counselor how each product is discovered and processed.
3. Review a geologic map of your area or an area selected by your counselor, and discuss the different rock types and estimated ages of rocks represented. Determine whether the rocks are horizontal, folded, or faulted, and explain how you arrived at your conclusion.
4. Do ONE of the following:
  - (a) With your parent's and counselor's approval, visit with a geologist, land-use planner, or civil engineer. Discuss this professional's work and the tools required in this line of work. Learn about a project that this person is now working on, and ask to see reports and maps created for this project. Discuss with your counselor what you have learned.
  - (b) Find out about three career opportunities available in geology. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.
5. Do ONE of the following (a OR b OR c OR d):
  - (a) Surface and Sedimentary Processes Option
    - (1) Conduct an experiment approved by your counselor that demonstrates how sediments settle from suspension in water. Explain to your counselor what the exercise shows and why it is important.
    - (2) Using topographical maps provided by your counselor, plot the stream gradients (different elevations divided by distance) for four different stream types (straight, meandering, dendritic, trellis). Explain which ones flow fastest and why, and which ones will carry larger grains of sediment and why.
    - (3) On a stream diagram, show areas where you will find the following features: cut bank, fill bank, point bar, medial channel bars, lake delta. Describe the relative sediment grain size found in each feature.
    - (4) Conduct an experiment approved by your counselor that shows how some sedimentary material carried by water may be too small for you to see without a magnifier.
    - (5) Visit a nearby stream. Find clues that show the direction of water flow, even if the water is missing. Record your observations in a notebook, and sketch those clues you observe. Discuss your observations with your counselor.

(b) Energy Resources Option

- (1) List the top five Earth resources used to generate electricity in the United States.
- (2) Discuss source rock, trap, and reservoir rock—the three components necessary for the occurrence of oil and gas underground.
- (3) Explain how each of the following items is used in subsurface exploration to locate oil or gas: reflection seismic, electric well logs, stratigraphic correlation, offshore platform, geologic map, subsurface structure map, subsurface isopach map, and core samples and cutting samples.
- (4) Using at least 20 data points provided by your counselor, create a subsurface structure map and use it to explain how subsurface geology maps are used to find oil, gas, or coal resources.
- (5) Do ONE of the following activities:
  - (a) Make a display or presentation showing how oil and gas or coal is found, extracted, and processed. You may use maps, books, articles from periodicals, and research found on the Internet (with your parent's permission). Share the display with your counselor or a small group (such as your class at school) in a five-minute presentation.
  - (b) With your parent's and counselor's permission and assistance, arrange for a visit to an operating drilling rig. While there, talk with a geologist and ask to see what the geologist does onsite. Ask to see cutting samples taken at the site.

(c) Mineral Resources Option

- (1) Define rock. Discuss the three classes of rocks including their origin and characteristics.
- (2) Define mineral. Discuss the origin of minerals and their chemical composition and identification properties, including hardness, specific gravity, color, streak, cleavage, luster, and crystal form.
- (3) Do ONE of the following:
  - (a) Collect 10 different rocks or minerals. Record in a notebook where you obtained (found, bought, traded) each one. Label each specimen, identify its class and origin, determine its chemical composition, and list its physical properties. Share your collection with your counselor.
  - (b) With your counselor's assistance, identify 15 different rocks and minerals. List the name of each specimen, tell whether it is a rock or mineral, and give the name of its class (if it is a rock) or list its identifying physical properties (if it is a mineral).
- (4) List three of the most common road-building materials used in your area. Explain how each material is produced and how each is used in road building.
- (5) Do ONE of the following activities:
  - (a) With your parent's and counselor's approval, visit an active mining site, quarry, or sand and gravel pit. Tell your counselor what you learned about the resources extracted from this location and how these resources are used by society.

(b) With your counselor, choose two examples of rocks and two examples of minerals. Discuss the mining of these materials and describe how each is used by society.

(c) With your parent's and counselor's approval, visit the office of a civil engineer and learn how geology is used in construction. Discuss what you learned with your counselor.

(d) Earth History Option

(1) Create a chart showing suggested geological eras and periods. Determine which period the rocks in your region might have been formed.

(2) Explain to your counselor the processes of burial and fossilization, and discuss the concept of extinction.

(3) Explain to your counselor how fossils provide information about ancient life, environment, climate, and geography. Discuss the following terms and explain how animals from each habitat obtain food: benthonic, pelagic, littoral, lacustrine, open marine, brackish, fluvial, eolian, protected reef.

(4) Collect 10 different fossil plants or animals OR (with your counselor's assistance) identify 15 different fossil plants or animals. Record in a notebook where you obtained (found, bought, traded) each one. Classify each specimen to the best of your ability, and explain how each one might have survived and obtained food. Tell what else you can learn from these fossils.

(5) Do ONE of the following:

(a) Visit a science museum or the geology department of a local university that has fossils on display. With your parent's and counselor's approval, before you go, make an appointment with a curator or guide who can show you how the fossils are preserved and prepared for display.

(b) Visit a structure in your area that was built using fossiliferous rocks. Determine what kind of rock was used and tell your counselor the kinds of fossil evidence you found there.

(c) Visit a rock outcrop that contains fossils. Determine what kind of rock contains the fossils, and tell your counselor the kinds of fossil evidence you found at the outcrop.

(d) Prepare a display or presentation on your state fossil. Include an image of the fossil, the age of the fossil, and its classification. You may use maps, books, articles from periodicals, and research found on the Internet (with your parent's permission). Share the display with your counselor or a small group (such as your class at school). If your state does not have a state fossil, you may select a state fossil from a neighboring state.



## Golf

1. Discuss safety on the golf course. Show that you know first aid for injuries or illnesses that could occur while golfing, including heat reactions, dehydration, blisters, sprains, and strains.
2. Study the USGA “Rules of Golf” now in use.
  - (a) Tell about the three categories of golf etiquette.
  - (b) Demonstrate that you understand the definitions of golf terms.
  - (c) Show that you understand the “Rules of Amateur Status.”
3. Tell about your understanding of the USGA system of handicapping.
4. Do the following:
  - (a) Tell about the early history of golf.
  - (b) Describe golf’s early years in the United States.
  - (c) Tell about the accomplishments of a top golfer of your choice.
5. Discuss with your counselor vocational opportunities related to golf.
6. Do the following:
  - (a) Tell how golf can contribute to a healthy lifestyle, mentally and physically.
  - (b) Tell how a golf exercise plan can help you play better. Show two exercises that would help improve your game.
7. Show the following:
  - (a) The proper grip, stance, posture, and key fundamentals of a good swing
  - (b) The full wood shot, played from a tee
  - (c) The fairway wood shot
  - (d) The long iron shot
  - (e) The short iron shot
  - (f) The approach, chip-and-run, and pitch shots
  - (g) The sand iron shot, bunker, or heavy rough recovery shots
  - (h) A sound putting stroke
8. Play a minimum of two nine-hole rounds or one 18-hole round of golf with another golfer about your age and with your counselor, or an adult approved by your counselor. Do the following:
  - (a) Follow the “Rules of Golf.”
  - (b) Practice good golf etiquette.
  - (c) Show respect to fellow golfers, committee, sponsor, and gallery.



## Graphic Arts

1. Review with your counselor the processes for producing printed communications: offset lithography, screen printing, electronic/digital, relief, and gravure. Collect samples of three products, each one produced using a different printing process, or draw diagrams to help you with your description.
2. Explain the differences between continuous tone, line, and halftone artwork. Describe how it can be created and/or stored in a computer.
3. Design a printed piece (flier, T-shirt, program, form, etc.) and produce it. Explain your decisions for the typeface or typefaces you use and the way you arrange the elements in your design. Explain which printing process is best suited for printing your design. If desktop publishing is available, identify what hardware and software would be appropriate for outputting your design.
4. Produce the design you created for requirement 3 using one of the following printing processes:

**(a) Offset lithography**

Make a layout, and produce a plate using a process approved by your counselor. Run the plate and print at least 50 copies.

**(b) Screen printing**

Make a hand-cut or photographic stencil and attach it to a screen that you have prepared. Mask the screen and print at least 20 copies.

**(c) Electronic/digital printing**

Create a layout in electronic form, download it to the press or printer, and run 50 copies. If no electronic interface to the press or printer is available, you may print and scan a paper copy of the layout.

**(d) Relief printing**

Prepare a layout or set the necessary type. Make a plate or lock up the form. Use this to print 50 copies.

5. Review the following postpress operations with your counselor:
  - (a) Discuss the finishing operations of padding, drilling, cutting, and trimming.
  - (b) Collect, describe, or identify examples of the following types of binding: perfect, spiral, plastic comb, saddle-stitched, and case.
6. Do ONE of the following, and then describe the highlights of your visit:
  - (a) Visit a newspaper printing plant: Follow a story from the editor to the press.
  - (b) Visit a retail, commercial, or in-plant printing facility. Follow a project from beginning to end.



- (c) Visit a school's graphic arts program. Find out what courses are available and what the prerequisites are.
- (d) Visit three Web sites (with your parent's permission) that belong to graphic arts professional organizations and/or printing-related companies (suppliers, manufacturers, printers). With permission from your parent or counselor, print out or download product or service information from two of the sites.
7. Find out about three career opportunities in graphic arts. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.



# H



## Hiking

1. Show that you know first aid for injuries or illnesses that could occur while hiking, including hypothermia, heatstroke, heat exhaustion, frostbite, dehydration, sunburn, sprained ankle, insect stings, tick bites, snakebite, blisters, hyperventilation, and altitude sickness.
2. Explain and, where possible, show the points of good hiking practices including the principles of Leave No Trace, hiking safety in the daytime and at night, courtesy to others, choice of footwear, and proper care of feet and footwear.
3. Explain how hiking is an aerobic activity. Develop a plan for conditioning yourself for 10-mile hikes, and describe how you will increase your fitness for longer hikes.
4. Make a written plan for a 10-mile hike. Include map routes, a clothing and equipment list, and a list of items for a trail lunch.
5. Take five hikes, each on a different day, and each of 10 continuous miles. Prepare a hike plan for each hike.\*
6. Take a hike of 20 continuous miles in one day following a hike plan you have prepared.\*
7. After each of the hikes (or during each hike if on one continuous “trek”) in requirements 5 and 6, write a short report of your experience. Give dates and descriptions of routes covered, the weather, and interesting things you saw. Share this report with your merit badge counselor.

\*The hikes in requirements 5 and 6 can be used in fulfilling Second Class (2a) and First Class (3) rank requirements, but only if Hiking merit badge requirements 1, 2, 3, and 4 have been completed to the satisfaction of your counselor. The hikes of requirements 5 and 6 *cannot* be used to fulfill requirements of other merit badges.



## Home Repairs

1. Discuss general precautions related to home repairs. Name at least 10 safe practices that every home repairer should exercise.
2. Under the supervision of your merit badge counselor, do FOUR of the following:
  - (a) Maintain or recondition a yard tool and show that you know how to clean up and properly store this equipment.
  - (b) Weather-strip a window or door.
  - (c) Caulk cracks or joints open to the weather.
  - (d) Waterproof a basement.
  - (e) Repair a break in a concrete or asphalt surface.
  - (f) Repair the screen in a window or door.
  - (g) Replace a pane of glass.
  - (h) Solder a broken wire or metal object.
3. Under the supervision of your merit badge counselor, do THREE of the following:
  - (a) Install or build equipment for storing tools.
  - (b) Build a workbench.
  - (c) Repair a piece of furniture.
  - (d) Paint or varnish a piece of furniture, a door, or trim on a house.
  - (e) Repair a sagging door or gate.
  - (f) Repair a loose step or railing.
  - (g) Repair a fence.
4. Under the supervision of your merit badge counselor, do TWO of the following:
  - (a) Locate a main electrical switch box and know how to replace a fuse or reset a circuit breaker.
  - (b) Replace an electrical cord or repair a plug or lamp socket.
  - (c) Install a single-pole light switch.
  - (d) Replace an electrical wall outlet.

**Either a parent or the merit badge counselor  
may supervise the Scout's work on any  
Home Repairs requirements.**

5. Under the supervision of your merit badge counselor, do TWO of the following:
    - (a) Clear a clogged drain or trap.
    - (b) Repair a leaky water faucet.
    - (c) Repair a flush toilet.
    - (d) Repair a leaky hose or connector.
    - (e) Clean or replace a sprinkler head.
  6. Under the supervision of your merit badge counselor, do THREE of the following:
    - (a) Paint a wall or ceiling.
    - (b) Repair or replace damaged tile or linoleum.
    - (c) Install drapery or curtain rods and then hang drapes or curtains.
    - (d) Replace window blind cords.
    - (e) Repair or replace a window sash cord.
    - (f) Reinforce a picture frame.
    - (g) Mend an object made of china, glass, or pottery.
- 



## Horsemanship

1. Do the following:
  - (a) Describe the safety precautions you should take when handling and caring for a horse.
  - (b) Describe the fire safety precautions you should take in a barn and around horses.
2. Name the 15 main parts of a horse.
3. Name four leading breeds of horses. Explain the special features for which each breed is known.
4. Describe the symptoms of colic. Name and describe four other horse health problems.
5. Explain what conformation is and why it is important. Explain the difference between lameness and unsoundness.
6. Explain the importance of hoof care and why a horse might need to wear shoes.
7. Demonstrate how to groom a horse, including picking hooves and caring for a horse after a ride.
8. Explain how to determine what and how much to feed a horse and why the amount and kind of feed are changed according to the activity level and the breed of horse.

9. Do the following:
  - (a) Name 10 parts of the saddle and bridle that you will use, and explain how to care for this equipment.
  - (b) Show how to properly saddle and bridle a horse.
  - (c) Demonstrate how to safely mount and dismount a horse.
10. Explain and demonstrate how to approach and lead a horse safely from a stall, corral, or field and how to tie the horse securely.
11. On level ground, continuously do the following movements after safely mounting the horse. Do them correctly, at ease, and in harmony with the horse.
  - (a) Walk the horse in a straight line for 60 feet.
  - (b) Walk the horse in a half-circle of not more than 16 feet in radius.
  - (c) Trot or jog the horse in a straight line for 60 feet.
  - (d) Trot or jog the horse in a half-circle of not more than 30 feet in radius.
  - (e) Lope (canter) the horse in a straight line for at least 60 feet.
  - (f) Lope (canter) the horse in a half-circle not more than 30 feet in radius.
  - (g) Halt straight.
  - (h) Back up straight four paces.
  - (i) Halt and dismount.

# I



## Indian Lore

1. Give the history of one American Indian tribe, group, or nation that lives or has lived near you. Visit it, if possible. Tell about traditional dwellings, way of life, tribal government, religious beliefs, family and clan relationships, language, clothing styles, arts and crafts, food preparation, means of getting around, games, customs in warfare, where members of the group now live, and how they live.
2. Do TWO of the following. Focus on a specific group or tribe.
  - (a) Make an item of clothing worn by members of the tribe.
  - (b) Make and decorate three items used by the tribe, as approved by your counselor.
  - (c) Make an authentic model of a dwelling used by an Indian tribe, group, or nation.
  - (d) Visit a museum to see Indian artifacts. Discuss them with your counselor. Identify at least 10 artifacts by tribe or nation, their shape, size, and use.
3. Do ONE of the following:
  - (a) Learn three games played by a group or tribe. Teach and lead one game with a Scout group.
  - (b) Learn and show how a tribe traditionally cooked or prepared food. Make three food items.
  - (c) Give a demonstration showing how a specific Indian group traditionally hunted, fished, or trapped.
4. Do ONE of the following:
  - (a) Write or briefly describe how life might have been different for the European settlers if there had been no native Americans to meet them when they came to this continent.
  - (b) Sing two songs in an Indian language. Explain their meanings.
  - (c) Learn in an Indian language at least 25 common terms and their meanings.
  - (d) Show 25 signs in Indian sign language. Include those that will help you ask for water, for food, and where the path or road leads.
  - (e) Learn in English (or the language you commonly speak at home or in the troop) an Indian story of at least 25 words, or any number of shorter ones adding up to 300 words. Tell the story or stories at a Scout meeting or campfire.

- (f) Write or tell about eight things adopted by others from American Indians.
- (g) Learn 25 Indian place names. Tell their origins and meanings.
- (h) Name five well-known American Indian leaders, either from the past or people of today. Give their tribes or nations. Describe what they did or do now that makes them notable.
- (i) Learn about the Iroquois Confederacy, including how and why it was formed. Tell about its governing system. Describe some of the similarities and differences between the governments of the United States and of the Six Nations (the Haudenosaunee or Iroquois Confederacy).
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## **Insect Study**

1. Tell how insects are different from all other animals. Show how insects are different from centipedes and spiders.
2. Point out and name the main parts of an insect.
3. Describe the characteristics that distinguish the principal families and orders of insects.
4. Do the following:
  - (a) Observe 20 different live species of insects in their habitat. In your observations, include at least four orders of insects.
  - (b) Make a scrapbook of the 20 insects you observe in 4a. Include photographs, sketches, illustrations, and articles. Label each insect with its common and scientific names, where possible. Share your scrapbook with your merit badge counselor.
5. Do the following:
  - (a) From your scrapbook collection, identify three species of insects helpful to humans and five species of insects harmful to humans.
  - (b) Describe some general methods of insect control.
6. Compare the life histories of a butterfly and a grasshopper. Tell how they are different.
7. Raise an insect through complete metamorphosis from its larval stage to its adult stage (e.g., raise a butterfly or moth from a caterpillar).\*
8. Observe an ant colony or a beehive. Tell what you saw.
9. Tell things that make social insects different from solitary insects.
10. Tell how insects fit in the food chains of other insects, fish, birds, and mammals.

11. Find out about three career opportunities in insect study. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.

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\*Some insects are endangered species and are protected by federal or state law. Every species is found *only* in its own special type of habitat. Be sure to check natural resources authorities in advance to be sure that you will not be collecting any species that is known to be protected or endangered, or in any habitat where collecting is prohibited. In most cases, all specimens should be returned at the location of capture after the requirement has been met. Check with your merit badge counselor for those instances where the return of these specimens would not be appropriate.

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## Inventing

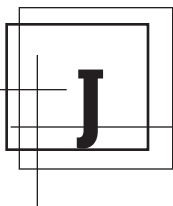
1. In your own words, define *inventing*. Then do the following:
  - (a) Explain to your merit badge counselor the role of inventors and their inventions in the economic development of the United States.
  - (b) List three inventions and state how they have helped humankind.
2. Do ONE of the following:
  - (a) Identify and interview with a buddy (and with your parent's permission and merit badge counselor's approval) an individual in your community who has invented a useful item. Report what you learned to your counselor.
  - (b) Read about three inventors. Select the one you find most interesting and tell your counselor what you learned.
3. Do EACH of the following:
  - (a) Define the term *intellectual property*. Explain which government agencies oversee the protection of intellectual property, the types of intellectual property that can be protected, how such property is protected, and why protection is necessary.
  - (b) Explain the components of a patent and the different types of patents available.
  - (c) Examine your Scouting gear and find a patent number on a camping item you have used. With your parent's permission, use the Internet to find out more about that patent. Compare the finished item with the claims and drawings in the patent. Report what you learned to your counselor.
  - (d) Explain to your counselor the term *patent infringement*.
4. Discuss with your counselor the types of inventions that are appropriate to share with others, and explain why. Tell your counselor about one nonpatented or noncopyrighted invention and its impact on society.



5. Choose a commercially available product that you have used on an overnight camping trip with your troop. Make recommendations for improving the product, and make a sketch that shows your recommendations. Discuss your recommendations with your counselor.
6. Think of an item you would like to invent that would solve a problem for your family, troop, chartered organization, community, or a special-interest group. Then do EACH of the following, while keeping a notebook to record your progress.
  - (a) Talk to potential users of your invention and determine their needs. Then, based on what you have learned, write a statement describing the invention and how it would help solve a problem. This statement should include a detailed sketch of the invention.
  - (b) Create a model of the invention using clay, cardboard, or any other readily available material. List the materials necessary to build a prototype of the invention.
  - (c) Share the idea and the model with your counselor and potential users of your invention. Record their feedback in your notebook.
7. Build a working prototype of the item you invented for requirement 6\*. Test and evaluate the invention. Among the aspects to consider in your evaluation are cost, usefulness, marketability, appearance, and function. Describe how your original vision and expectations for your invention are similar or dissimilar to the prototype you built. Have your counselor evaluate and critique your prototype.
8. Do ONE of the following:
  - (a) Participate with a club or team (robotics team, science club, or engineering club) that builds a useful item. Share your experience with your counselor.
  - (b) Visit a museum or exhibit dedicated to an inventor or invention, and create a presentation of your visit to share with a group such as your troop or patrol.
9. Discuss with your counselor the diverse skills, education, training, and experience it takes to be an inventor. Discuss how you can prepare yourself to be creative and inventive to solve problems at home, in school, and in your community. Discuss three career fields that might utilize the skills of an inventor.

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\*Before you begin building the prototype, you must have your counselor's approval, based on the design and building plans you have already shared.



## Journalism

1. Explain what freedom of the press is and how the First Amendment guarantees that you can voice your opinion. In your discussion, tell how to distinguish between fact and opinion, and explain the terms *libel*, *slander*, *defamation*, *fair comment and criticism*, *public figure*, *privacy*, and *malice*. Discuss how these matters relate to ethics in journalism.

2. Do either A OR B:

### (a) Newspaper and magazine journalism

(1) All on the same day, read a local newspaper, a national newspaper, a newsmagazine, and (with your parent's permission) an online news source. From each source, clip, read, and compare a story about the same event. Tell your counselor how long each story is and how fair and accurate the stories are in presenting different points of view. Tell how each source handled the story differently, depending on its purpose or audience.

(2) Visit a newspaper or magazine office. Ask for a tour of the various divisions (editorial, business, and printing). During your tour, talk to an executive from the business side about management's relations with reporters, editors, and photographers and what makes a "good" newspaper or magazine.

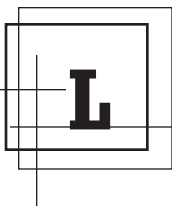
### (b) Radio and television journalism

(1) All on the same day, watch a local and national network newscast, listen to a radio newscast, and (with your parent's permission) view a national broadcast news source online. List the different news items and features presented, the different elements used, and the time in minutes and seconds and the online space devoted to each story. Compare the story lists and discuss whether the stories are fair and accurate. Explain why different news outlets treated the stories differently and/or presented a different point of view.

(2) Visit a radio or television station. Ask for a tour of the various departments, concentrating on those related to news broadcasts. During your tour, talk to the station manager or other station management executive about station operations, particularly how management and the news staff work together, and what makes a "good" station. If possible, go with a reporter to cover a news event.

3. Discuss the differences between a hard news story and a feature story. Explain what is the “five W’s and H.” Then do ONE of the following:
  - (a) Choose a current or an unusual event of interest to you, and write either a hard news article OR a feature article about the event. Gear the article for print OR audio OR video journalism. Share your article with your counselor.
  - (b) With your parent’s permission and counselor’s approval, interview someone in your community who is influential because of his or her leadership, talent, career, or life experiences. Then present to your counselor either a written or oral report telling what you learned about this person.
  - (c) With your parent’s permission and counselor’s approval, read an autobiography written by a journalist you want to learn more about. Write an article that tells what you learned about this person and the contributions this person has made to the field of journalism.
  - (d) Attend a Scouting event and write a 200-word article (feature or hard news) about the event. Use either the inverted pyramid style or the chronological style. Review the article with your counselor, then submit it to your community newspaper or BSA local council or district newsletter for consideration.
4. Attend a public event and do ONE of the following:
  - (a) Write two newspaper articles about the event, one using the inverted pyramid style and one using the chronological style.
  - (b) Using a radio or television broadcasting style, write a news story, a feature story, and a critical review of the event.
  - (c) Take a series of photographs to help tell the story of the event in pictures. Include news photos and feature photos in your presentation. Write a brief synopsis of the event as well as captions for your photos.
5. Find out about three career opportunities in journalism. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.





## Landscape Architecture

1. Go to a completed landscape project that a landscape architect has designed. Before you visit the site, obtain a plan of the design from the landscape architect if one is available.
2. After completing requirement 1, discuss the following with your merit badge counselor:
  - (a) Tell whether the design had separate spaces, a clear path system, and sun and shade variety.
  - (b) Discuss how the designated seating, eating, or parking areas suited the overall design.
  - (c) Explain how the design reflected consideration for the comfort, shelter, and security of the users.
  - (d) Discuss how the choice of trees, shrubs, and ground covers used in the project contributed to its appeal and function.
3. Identify five shrubs, five trees, and one ground cover, being sure that you select examples of different shapes, sizes, and textures. With the help of your counselor or a local nursery, choose plants that will grow in your area. Bring pictures of the different planting materials or, if possible, examples of their branches, leaves, or flowers to a group such as your troop or class at school. Be prepared to tell how you might use each in the design of a landscape.
4. Look at and study a place of worship or school grounds to find the place where most people arrive by bus or car. Show you can do the following:
  - (a) Using a measuring tape, measure and draw the entry and its nearby area using a scale of 1/8 inch equals 1 foot on an 11-by-17-inch piece of paper. Be sure to include the driveway and the wall and door where people enter the school or place of worship. Indicate any sidewalks, structures, trees, and plants within the study area. Make two copies of this plan to save the original, then do 4b and 4c using the copies.
  - (b) On one copy, use directional arrows to indicate where the water drains across the site, where ditches occur, and where water stands for a longer period of time.

- (c) Decide how you can make the place safer and more comfortable for those using it. Redesign the area on another copy of the plan. You may want to include new walks, covered waiting areas, benches, space-defining plantings of trees and shrubs, and drainage structures.
5. Find out about three career opportunities in landscape architecture. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.
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## Law

1. Define “law.” Tell some of its sources. Describe functions it serves.
2. Discuss TWO of the following:
  - (a) Justinian’s Code, the Code of Hammurabi, and the Magna Carta
  - (b) The development of the jury system
  - (c) Two famous trials in history
3. Tell what civil law is; tell what criminal law is. Tell the main differences between them. Give examples of each.
4. Ask five people (not more than one from your immediate family) about the role of law enforcement officers in our society. Discuss their answers with them. Go to a law enforcement officer in your neighborhood and ask about his or her responsibilities and duties. Report your findings.
5. Tell about several laws that were passed to protect the consumer and the seller. Tell about several organizations that provide help to consumers and sellers.
6. Do ONE of the following:
  - (a) Attend a session of a civil or criminal court. Write 250 words or more on what you saw.
  - (b) Plan and conduct a mock trial with your troop or school class. After the trial is over, discuss it with the group.
7. Arrange a visit with a lawyer who works for a business, bank, title company, or government agency. Find out his or her duties and responsibilities. Report what you have learned.
8. Explain the requirements for becoming a lawyer in your state. Describe how judges are selected in your state.
9. Make a list of 15 jobs that deal with some aspects of law or legal processes. Tell which you prefer. Why?

10. Tell where people can go to obtain the help of a lawyer if they are unable to pay for one. Tell what you can do if you can afford a lawyer but do not know of any in your area.
  11. Discuss with your counselor the importance in our society of TWO of the following areas of law that have recently emerged and are still developing:
    - (a) Environmental law
    - (b) Computers and the Internet
    - (c) Copyright and the Internet
    - (d) Space travel and satellites orbiting Earth
- 



## Leatherwork

1. Identify and demonstrate to your counselor the safe use of leatherworking tools. Show correct procedures for handling leathercraft dyes, cements, and finishes. Know first aid for cuts, internal poisoning, and skin irritation.
2. Explain to your counselor
  - (a) Where leather comes from
  - (b) What kinds of hides are used to make leather
  - (c) What are five types of leather
  - (d) What are the best uses for each type of leather
3. Make one or more articles of leather that use at least five of the following steps:
  - (a) Pattern layout and transfer
  - (b) Cutting leather
  - (c) Punching holes
  - (d) Carving or stamping surface designs
  - (e) Applying dye or stain and finish to the project
  - (f) Assembly by lacing or stitching
  - (g) Setting snaps and rivets
  - (h) Dressing edges
4. Recondition or show that you can take proper care of your shoes, a baseball glove, a saddle, furniture, or other articles of leather.

5. Do ONE of the following:

- (a) Learn about the commercial tanning process. Report about it to your merit badge counselor.
- (b) Tan the skin of a small animal. Describe the safety precautions you will take and the tanning method that you used.
- (c) Braid or plait an article out of leather or vinyl lace.
- (d) Visit a leather-related business. This could be a leathercraft supply company, a tannery, a leather goods or shoe factory, or a saddle shop. Report on your visit to your counselor.



## Lifesaving

1. Before doing requirements 2 through 15:

- (a) Complete Second Class rank requirements 8a through 8c and First Class rank requirements 9a through 9c.

*Second Class rank requirements 8a through 8c:*

- (8a) Tell what precautions must be taken for a safe swim.
- (8b) Demonstrate your ability to jump feetfirst into water over your head in depth, level off and swim 25 feet on the surface, stop, turn sharply, resume swimming, then return to your starting place.
- (8c) Demonstrate water rescue methods by reaching with your arm or leg, by reaching with a suitable object, and by throwing lines and objects. Explain why swimming rescues should not be attempted when a reaching or throwing rescue is possible, and explain why and how a rescue swimmer should avoid contact with the victim.

*First Class rank requirements 9a through 9c:*

- (9a) Tell what precautions must be taken for a safe trip afloat.
  - (9b) Successfully complete the BSA swimmer test.\*
  - (9c) With a helper and a practice victim, show a line rescue both as tender and as rescuer. (The practice victim should be approximately 30 feet from shore in deep water.)
- (b) Swim continuously for 400 yards using each of the following strokes in a strong manner for at least 50 continuous yards: front crawl, sidestroke, breaststroke, and elementary backstroke.

NOTE: Alternate requirements for the Second Class and First Class ranks are available for Scouts with physical or mental disabilities if they meet the criteria listed on page 13.

\*See the Swimming merit badge requirements later in this pamphlet for details about the BSA swimmer test.

2. Explain the following:
  - (a) Common drowning situations and how to prevent them.
  - (b) How to identify persons in the water who need assistance.
  - (c) The order of methods in water rescue.
  - (d) How rescue techniques vary depending on the setting and the condition of the person needing assistance.
  - (e) Situations for which in-water rescues should not be undertaken.
3. Demonstrate “reaching” rescues using various items such as arms, legs, towels, shirts, paddles, and poles.
4. Demonstrate “throwing” rescues using various items such as lines, ring buoys, rescue bags, and free-floating supports. Successfully place at least one such aid within reach of a practice victim 25 feet from shore.
5. Show or explain the use of rowboats, canoes, or other small craft in performing rescues.
6. List various items that can be used as rescue aids in a noncontact swimming rescue. Explain why buoyant aids are preferred.
7. Perform the following *equipment-based rescues for a conscious practice subject* 30 feet from shore. Use a proper entry and a strong approach stroke. Speak to the subject to determine his condition and to provide instructions and encouragement.
  - (a) Present a rescue tube to the subject, release it, and escort the victim to safety.
  - (b) Present a rescue tube to the subject and use it to tow the victim to safety.
  - (c) Present a buoyant aid other than a rescue tube to the subject, release it, and escort the victim to safety.
  - (d) Present a buoyant aid other than a rescue tube to the subject and use it to tow the victim to safety.
  - (e) Remove street clothes in 20 seconds or less and use a nonbuoyant aid, such as a shirt or towel, to tow the subject to safety. Explain when it is appropriate to remove heavy clothing before attempting a swimming rescue.
8. Explain the importance of avoiding contact with an active victim and describe lead-and-wait tactics.
9. Perform the following *nonequipment rescues for a conscious practice subject* 30 feet from shore. Begin in the water from a position near the subject. Speak to the subject to determine his condition and to provide instructions and encouragement.
  - (a) Provide a swim-along assist for a calm, responsive, tired swimmer moving with a weak forward stroke.
  - (b) Perform an armpit tow for a calm, responsive, tired swimmer resting with a back float.
  - (c) Perform a cross-chest carry for an exhausted, passive victim who does not respond to instructions to aid himself.



10. In deep water, show how to escape from a victim's grasp on your wrist. Repeat for front and rear holds about the head and shoulders.
11. Perform the following rescues for an *unconscious practice subject* at or near the surface 30 feet from shore. Use a proper entry and strong approach stroke. Speak to the subject and splash water on him to determine his condition before making contact. Remove the victim from the water, with assistance if needed, and position for CPR.
  - (a) Perform an equipment assist using a buoyant aid.
  - (b) Perform a front approach and wrist tow.
  - (c) Perform a rear approach and armpit tow.
12. Describe how to respond if a victim submerges before being reached by a rescuer, and do the following:
  - (a) Recover a 10-pound weight in 8 to 10 feet of water using a feetfirst surface dive.
  - (b) Repeat using a headfirst surface dive.
13. Demonstrate knowledge of resuscitation procedures:
  - (a) Describe how to recognize the need for rescue breathing and CPR.
  - (b) Demonstrate proper CPR technique for at least 3 minutes using a mannequin designed to simulate ventilations and compressions.
14. Demonstrate management of a spinal injury:
  - (a) Explain the signs and symptoms of a spinal injury.
  - (b) Support a faceup victim in calm, shallow water.
  - (c) Turn a subject from a facedown to a faceup position while maintaining support.
15. Show that you know first aid for other injuries or illnesses that could occur while swimming or boating, including hypothermia, heat reactions, muscle cramps, sunburn, stings, and hyperventilation.

# M



## Mammal Study

1. Explain the meaning of “animal,” “invertebrate,” “vertebrate,” and “mammal.” Name three characteristics that distinguish mammals from all other animals.
2. Explain how the animal kingdom is classified. Explain where mammals fit in the classification of animals. Classify three mammals from phylum through species.
3. Do ONE of the following:
  - (a) Spend three hours in each of two different kinds of natural habitats or at different elevations. List the different mammal species and individual members that you identified by sight or sign. Tell why all mammals do not live in the same kind of habitat.
  - (b) Spend three hours on each of five days on at least a 25-acre area (about the size of 3½ football fields). List the mammal species you identified by sight or sign.
  - (c) From study and reading, write a simple history of one nongame mammal that lives in your area. Tell how this mammal lived before its habitat was affected in any way by humans. Tell how it reproduces, what it eats, and its natural habitat. Describe its dependency upon plants and other animals (including humans), and how they depend upon it. Tell how it is helpful or harmful to humankind.
4. Do ONE of the following:
  - (a) Under the guidance of a nature center or natural history museum, make two study skins of rats or mice. Tell the uses of study skins and mounted specimens respectively.
  - (b) Take good pictures of two kinds of mammals in the wild. Record light conditions, film used, exposure, and other factors, including notes on the activities of the pictured animals.
  - (c) Write a life history of a native game mammal that lives in your area, covering the points outlined in requirement 3c. List sources for this information.
  - (d) Make and bait a tracking pit. Report what mammals and other animals came to the bait.
  - (e) Visit a natural history museum. Report on how specimens are prepared and cataloged. Explain the purposes of museums.

- (f) Write a report of 500 words on a book about a mammal species.
- (g) Trace two possible food chains of carnivorous mammals from soil through four stages to the mammal.
5. Working with your counselor, select and carry out one project that will influence the numbers of one or more mammals.
- 



## Medicine

1. Discuss with your counselor the influence that EIGHT of the following people had on the history of medicine:
  - (a) Hippocrates
  - (b) William Harvey
  - (c) Antonie van Leewenhoek
  - (d) Edward Jenner
  - (e) Florence Nightingale
  - (f) Louis Pasteur
  - (g) Gregor Mendel
  - (h) Joseph Lister
  - (i) Robert Koch
  - (j) Daniel Hale Williams
  - (k) Wilhelm Conrad Roentgen
  - (l) Marie and Pierre Curie
  - (m) Walter Reed
  - (n) Karl Landsteiner
  - (o) Alexander Fleming
  - (p) Charles Richard Drew
  - (q) Helen Raussig
  - (r) James Watson and Francis Crick
  - (s) Jonas Salk
2. Explain the Hippocratic Oath to your counselor, and compare the original version to a more modern one. Discuss to whom those subscribing to the original version of the oath owe the greatest allegiance.
3. Discuss the health-care provider–patient relationship with your counselor, and the importance of such a relationship in the delivery of quality care to the patient. Describe the role of confidentiality in this relationship.
4. Do the following:
  - (a) Describe the roles the following people play in the delivery of health care in your state. (Note: Not all may exist in your state.)
    - (1) Allopathic physician
    - (2) Chiropractor
    - (3) Emergency medical technician

- (4) Licensed practical/vocational nurse
- (5) Medical assistant
- (6) Medical laboratory technologist
- (7) Nurse-midwife
- (8) Nurse practitioner
- (9) Occupational therapist
- (10) Optometrist
- (11) Osteopathic physician
- (12) Pharmacist
- (13) Physical therapist
- (14) Physician's assistant
- (15) Podiatrist
- (16) Psychologist
- (17) Radiologic technologist
- (18) Registered nurse
- (19) Respiratory therapist

(b) Describe the educational and licensing requirements for FIVE of those in 4a—other than 4a(1)—practicing health care in your state.

5. (a) Tell what is meant by the term “primary care” with regard to a medical specialty. Briefly describe the types of work done by physicians in the following “core” specialties:

- (1) Internal medicine\*
- (2) Family practice\*
- (3) Obstetrics/gynecology\*
- (4) Pediatrics\*
- (5) Psychiatry
- (6) Surgery

(b) Describe the additional educational requirements for these specialties.

6. Do the following:

(a) Briefly describe the types of work performed by physicians in FIVE of the following specialties or subspecialties:

- (1) Allergy/immunology
- (2) Anesthesiology
- (3) Cardiology
- (4) Colon and rectal surgery
- (5) Dermatology
- (6) Emergency medicine
- (7) Endocrinology
- (8) Gastroenterology
- (9) Geriatric medicine
- (10) Hematology/oncology

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\*“Primary care” specialties

- (11) Infectious disease
- (12) Nephrology
- (13) Neuro surgery
- (14) Neurology
- (15) Nuclear medicine
- (16) Ophthalmology
- (17) Orthopedic surgery
- (18) Otolaryngology/head and neck surgery
- (19) Pathology
- (20) Physical medicine and rehabilitation
- (21) Plastic, reconstructive, and maxillofacial surgery
- (22) Preventive medicine
- (23) Radiology
- (24) Rheumatology
- (25) Thoracic/cardiothoracic surgery
- (26) Urology
- (27) Vascular surgery

(b) Describe the additional educational requirements for the FIVE specialties or subspecialties you chose in 6a.

7. (a) Visit a physician's office\*, preferably one who delivers "primary care." (This may be that of your counselor.) Discuss the components of a medical history and physical examination (an official BSA health form may be used to guide this discussion), and become familiar with the instruments used.
  - (b) Describe the characteristics of a good diagnostic test to screen for disease (e.g., routine blood pressure measurement). Explain briefly why diagnostic tests are not "perfect."
  - (c) Show how to take a blood pressure and a pulse reading.
8. Do the following:
  - (a) Discuss the roles medical societies, employers, the insurance industry, and the government play in influencing the practice of medicine in the United States.
  - (b) Briefly tell how your state monitors the quality of health care within its borders, and how it provides care to those who do not have health insurance.
9. Discuss with your counselor the health-care delivery systems in the United States, Sweden, and China.
10. Serve as a volunteer at a health-related event or facility in your community (e.g., blood drive, "health fair," blood pressure screening, etc.) approved by your counselor.

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\*If this cannot be arranged, demonstrate to your counselor that you understand the components of a medical history and physical, and discuss the instruments involved.



## Metalwork

1. Read the safety rules for metalwork. Discuss how to be safe while working with metal. Discuss with your counselor the additional safety rules that apply to the metalwork option you choose for requirement 5.
2. Define the terms native metal, malleable, metallurgy, alloy, nonferrous, and ferrous. Then do the following:
  - (a) Name two nonferrous alloys used by pre-Iron Age metalworkers. Name the metals that are combined to form these alloys.
  - (b) Name three ferrous alloys used by modern metalworkers.
  - (c) Describe how to work-harden a metal.
  - (d) Describe how to anneal a nonferrous and a ferrous metal.
3. Do the following:
  - (a) Work-harden a piece of 26- or 28-gauge sheet brass or sheet copper. Put a 45-degree bend in the metal, then heavily peen the area along the bend line to work-harden it. Note the amount of effort that is required to overcome the yield point in this unworked piece of metal.
  - (b) Soften the work-hardened piece from requirement 3a by annealing it, and then try to remove the 45-degree bend. Note the amount of effort that is required to overcome the yield point.
  - (c) Make a temper color index from a flat piece of steel. Using hand tools, make and temper a center punch of medium-carbon or high-carbon steel.
4. Find out about three career opportunities in metalworking. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.
5. After completing the first four requirements, complete at least ONE of the options listed below.

### (a) Option 1—Sheet Metal Mechanic/Tinsmith

- (1) Name and describe the use of the basic sheet metalworking tools.
- (2) Create a sketch of two objects to make from sheet metal. Include each component's dimensions on your sketch, which need not be to scale.
- (3) Make two objects out of 24- or 26-gauge sheet metal. Use patterns either provided by your counselor or made by you and approved by your counselor. Construct these objects using a metal that is appropriate to the object's ultimate purpose, and using cutting, bending, edging, and either soldering or brazing.

- (a) One object also must include at least one riveted component.
- (b) If you do not make your objects from zinc-plated sheet steel or tin-plated sheet steel, preserve your work from oxidation.

**(b) Option 2—Silversmith**

- (1) Name and describe the use of a silversmith's basic tools.
- (2) Create a sketch of two objects to make from sheet silver. Include each component's dimensions on your sketch, which need not be to scale.
- (3) Make two objects out of 18- or 20-gauge sheet copper. Use patterns either provided by your counselor or made by you and approved by your counselor. Both objects must include a soldered joint. If you have prior silversmithing experience, you may substitute sterling silver, nickel silver, or lead-free pewter.
  - (a) At least one object must include a sawed component you have made yourself.
  - (b) At least one object must include a sunken part you have made yourself.
  - (c) Clean and polish your objects.

**(c) Option 3—Founder**

- (1) Name and describe the use of the basic parts of a two-piece mold. Name at least three different types of molds.
- (2) Create a sketch of two objects to cast in metal. Include each component's dimensions on your sketch, which need not be to scale.
- (3) Make two molds, one using a pattern provided by your counselor and another one you have made yourself that has been approved by your counselor. Position the pouring gate and vents yourself. *Do not use copyrighted materials as patterns.*
  - (a) Using lead-free pewter, make a casting using a mold provided by your counselor.
  - (b) Using lead-free pewter, make a casting using the mold that you have made.

**(d) Option 4—Blacksmith**

- (1) Name and describe the use of a blacksmith's basic tools.
- (2) Make a sketch of two objects to hot-forged. Include each component's dimensions on your sketch, which need not be to scale.
- (3) Using low-carbon steel at least  $\frac{1}{4}$  inch thick, perform the following exercises:
  - (a) Draw out by forging a taper.
  - (b) Use the horn of the anvil by forging a U-shaped bend.

- (c) Form a decorative twist in a piece of square steel.
  - (d) Use the edge of the anvil to bend metal by forging an L-shaped bend.
- (4) Using low-carbon steel at least  $\frac{1}{4}$  inch thick, make the two objects you sketched that require hot-forging. Be sure you have your counselor's approval before you begin.
- (a) Include a decorative twist on one object.
  - (b) Include a hammer-riveted joint in one object.
  - (c) Preserve your work from oxidation.
- 



## Model Design and Building

1. Study and understand the requirements for personal safety when using such modelmaker hand tools as knives, handsaws, vises, files, hammers, screwdrivers, hand drills and drill bits, pliers, and portable power tools, and when to use proper protective equipment such as goggles when grinding or drilling. Know what precautions to take when using flammable or hazardous products such as glue, epoxy, paint, and thinners. Discuss these with your counselor before you begin your modelmaking project and tell why they are important.
2. Explain the uses for each of the following types of models: architectural, structural, process, mechanical, and industrial. Do research into the different types of materials that could be used in making these models.
3. With your counselor's advice, select a subject from requirement 4 for your model project (no kits). Prepare the necessary plans to the proper scale. Make a list of materials and a list of the required tools. This model should be your own original work. Tell why you selected this subject.
4. Do ONE of the following:
  - (a) Make an architectural model. Build a model of a house to a scale of  $\frac{1}{4}$ " = 1'0" (50:1 metric). Discuss with your counselor the materials you intend to use, the amount of detail required, outside treatment (finish, shrubbery, walks, etc.), and color selections. After completing the model, present it to your counselor for approval.
  - (b) Build a structural model. Construct a model showing corner construction of a wood-frame building to a scale of  $1\frac{1}{2}$ " = 1'0" (8:1 metric). All structures shown must be to scale. Cardboard or flat sheet wood stock may be used for sheeting or flooring on the model. Review with your counselor the problems you encountered in gathering the materials and supporting the structure. Be able to name the parts of the floor and wall frames, such as intermediate girder, joist, bridging, subfloor, sill, sole plate, stud, and rafter.



- (c) Make a process model. Build a model showing the plumbing system in your house. Show hot and cold water supply, all waste returns, and venting to a scale of  $\frac{3}{4}$ " = 1'0" (15:1 metric). Talk to your counselor about how to begin this model, and present the scale and the materials you will use. After completion, present the model to your counselor, and be prepared to discuss any problems you had building this model.
- (d) Complete a mechanical model. Build a model of a mechanical device that uses at least two of the six simple machines. After completing the model, present it to your counselor. Be prepared to discuss materials used, the machine's function, and any particular difficulty you might have encountered.
- (e) Make an industrial model. Build a model of an actual passenger-carrying vehicle to a scale of 1" = 1'0" or  $\frac{1}{2}$ " = 1'0" (10:1 or 25:1 metric). Take the dimensions of the vehicle and record the important dimensions. Draw the top, front, rear, and sides of the vehicle to scale. From your plans, build a model of the vehicle and finish it in a craftsmanlike manner. Discuss with your counselor the most difficult part of completing the model.
5. Build a special-effects model of a fantasy spacecraft that might appear in a Hollywood science-fiction movie. Determine an appropriate scale for your design—one that makes practical sense. Include a cockpit or control area, living space, storage unit, engineering spaces, and propulsion systems. As you plan and build your model, do the following:
- (a) Study aircraft, submarines, and naval ships for design ideas.
  - (b) Arrange and assemble the parts.
  - (c) Sketch your completed model.
  - (d) Write a short essay in which you discuss your design, scale, and materials choices. Describe how you engineered your model and discuss any difficulties you encountered and what you learned.
6. List at least six occupations in which modelmaking is used and discuss with your counselor some career opportunities in this field.



## Motorboating

1. Do the following:
  - (a) Explain first aid for injuries or illnesses that could occur while motorboating, including hypothermia, heat reactions, dehydration, motion sickness, insect stings, tick bites, and blisters.
  - (b) Identify the conditions that must exist before performing CPR on a person, and explain how such conditions are recognized. Demonstrate proper technique for performing CPR using a training device approved by your counselor.
2. Do the following:
  - (a) Before doing requirements 3 through 6, successfully complete the BSA swimmer test.\*
  - (b) Name the different types of personal flotation devices (PFDs), and explain when each type should be used. Show how to choose and properly fit a PFD.
3. Do the following:
  - (a) Explain inboard, outboard, and inboard/outboard motors, and the uses and advantages of each. Discuss the special features of a bass boat and a ski boat.
  - (b) Explain the safety procedures and precautions involving handling fuel and engine servicing, and equipment storage and placement.
  - (c) Explain how to winterize a boat motor and tell why this procedure is necessary.
  - (d) Explain the safety procedures and precautions involving swimmers and skiers in the water, passenger positions under way, and boat wakes.
4. Show you know safety laws for motorboating by doing the following:
  - (a) Have a permit to run a motorboat, if needed.
  - (b) Explain the rules or laws that apply to recreational boating in your area or state.
  - (c) Discuss how the hazards of weather and heavy water conditions can affect both safety and performance in motorboating.
  - (d) Promise that you will follow BSA Safety Afloat guidelines. Explain the meaning of each point.
  - (e) Discuss with your counselor the nautical rules of the road and describe the national and your state's aids to navigation.
  - (f) Explain and show the correct use of equipment required by both state and federal regulations to be carried aboard a motorboat.
  - (g) Explain federal and state rules for a ventilation system, and tell why these rules are required.
5. Demonstrate proper boat-handling procedures and skills by doing the following:
  - (a) Board and assist others in boarding.
  - (b) Fuel the boat and complete a safety check.
  - (c) Get under way from dockside or from a beach launch.
  - (d) Run a course for at least a mile, showing procedures for overtaking and passing slower craft, yielding right-of-way, passing oncoming traffic, making turns, reversing direction, and using navigation aids.

\*See the Swimming merit badge requirements later in this pamphlet for details about the BSA swimmer test.

- (e) Stop and secure the boat in position on the open water using anchors; get under way.
  - (f) Land or dock; get out and assist others.
  - (g) Moor the boat and secure all gear.
6. Point out and explain the mechanical and safety features of a boat trailer. With others assisting, do the following:
- (a) Launch a boat from a trailer.
  - (b) Remove a boat from the water using a trailer.
- 



## Music

1. Sing or play a simple song or hymn chosen by your counselor, using good technique, phrasing, tone, rhythm, and dynamics. Read all the signs and terms of the score.
2. Name the five general groups of musical instruments. Create an illustration that shows how tones are generated and how instruments produce sound.
3. Do TWO of the following:
  - (a) Attend a live performance, or listen to three hours of recordings from any two of the following musical styles: blues, jazz, classical, country, bluegrass, ethnic, gospel, musical theater, opera. Describe the sound of the music and the instruments used. Identify the composers or songwriters, the performers, and the titles of the pieces you heard. If it was a live performance, describe the setting and the reaction of the audience. Discuss your thoughts about the music.
  - (b) Interview your parents and grandparents about music. Find out what the most popular music was when they were your age. Find out what their favorite music is now, and listen to three of their favorite tunes with them. How do their favorites sound to you? Had you ever heard any of them? Play three of your favorite songs for them, and explain to them why you like these songs. Ask them what they think of your favorite music.
  - (c) Serve for six months as a member of a school band, choir, or other local musical group, or perform as a soloist in public six times.
  - (d) List five people who are important in the history of American music and explain to your counselor why they continue to be influential. Include at least one composer, one performer, one innovator, and one person born more than 100 years ago.
4. Do ONE of the following:
  - (a) Teach three songs to a group of people. Lead them in singing the songs, using proper hand motions.
  - (b) Compose and write the score for a piece of music of 12 measures or more.
  - (c) Make a traditional instrument and learn to play it.
  - (d) Catalog your own or your family's collection of 12 or more compact discs, tapes, or records. Show how to handle and store them.

# N



## Nature

1. Name three ways in which plants are important to animals. Name a plant that is protected in your state or region, and explain why it is at risk.
2. Name three ways in which animals are important to plants. Name an animal that is protected in your state or region, and explain why it is at risk.
3. Explain the term “food chain.” Give an example of a four-step land food chain and a four-step water food chain.
4. Do all of the requirements in FIVE of the following fields:
  - (a) Birds
    - (1) In the field, identify eight species of birds.
    - (2) Make and set out a birdhouse OR a feeding station OR a birdbath. List what birds used it during a period of one month.
  - (b) Mammals
    - (1) In the field, identify three species of wild animals.
    - (2) Make plaster casts of the tracks of a wild mammal.
  - (c) Reptiles and Amphibians
    - (1) Show that you can recognize the venomous snakes in your area.
    - (2) In the field, identify three species of reptiles or amphibians.
    - (3) Recognize one species of toad or frog by voice; OR identify one reptile or amphibian by eggs, den, burrow, or other signs.
  - (d) Insects and Spiders
    - (1) Collect, mount, and label 10 species of insects or spiders.
    - (2) Hatch an insect from the pupa or cocoon; OR hatch adults from nymphs; OR keep larvae until they form pupae or cocoons; OR keep a colony of ants or bees through one season.
  - (e) Fish
    - (1) Catch and identify two species of fish.
    - (2) Collect four kinds of animal food eaten by fish in the wild.

(f) Mollusks and Crustaceans

- (1) Identify five species of mollusks and crustaceans.
- (2) Collect, mount, and label six shells.

(g) Plants

- (1) In the field, identify 15 species of wild plants.
- (2) Collect and label the seeds of six plants OR the leaves of 12 plants.

(h) Soils and Rocks

- (1) Collect and identify soils found in different layers of a soil profile.
- (2) Collect and identify five different types of rocks from your area.

NOTE: In most cases all specimens should be returned to the wild at the location of original capture after the requirements have been met. Check with your merit badge counselor for those instances where the return of these specimens would not be appropriate.

Under the Endangered Species Act of 1973, some plants and animals are or may be protected by federal law. The same ones and/or others may be protected by state law. Be sure that you do not collect protected species.

Your state may require that you purchase and carry a license to collect certain species. Check with the wildlife and fish and game officials in your state regarding species regulations before you begin to collect.

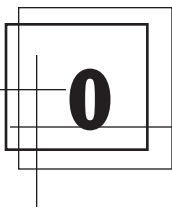




## Nuclear Science

1. Do the following:
  - (a) Tell what radiation is.
  - (b) Describe the hazards of radiation to humans, the environment, and wildlife. Explain the difference between radiation exposure and contamination. In your explanation, discuss the nature and magnitude of radiation risks to humans from nuclear power, medical radiation, and background radiation including radon. Explain the ALARA principle and measures required by law to minimize these risks.
  - (c) Describe the radiation hazard symbol and explain where it should be used. Tell why and how people must use radiation or radioactive materials carefully.
2. Do the following:
  - (a) Tell the meaning of the following: atom, nucleus, proton, neutron, electron, quark, isotope; alpha particle, beta particle, gamma ray, X-ray; ionization, radioactivity, and radioisotope.
  - (b) Choose an element from the periodic table. Construct 3-D models for the atoms of three isotopes of this element, showing neutrons, protons, and electrons. Use the three models to explain the difference between atomic number and mass number and the difference between the quark structure of a neutron and a proton.
3. Do ONE of the following; then discuss modern particle physics with your counselor:
  - (a) Visit an accelerator (research lab) or university where people study the properties of the nucleus or nucleons.
  - (b) Name three particle accelerators and describe several experiments that each accelerator performs.
4. Do TWO of the following; then discuss with your counselor the different kinds of radiation and how they can be used:
  - (a) Build an electroscope. Show how it works. Place a radiation source inside and explain the effect it causes.
  - (b) Make a cloud chamber. Show how it can be used to see the tracks caused by radiation. Explain what is happening.
  - (c) Obtain a sample of irradiated and non-irradiated foods. Prepare the two foods and compare their taste and texture. Store the leftovers in separate containers and under the same conditions. For a period of 14 days, observe their

- rate of decomposition or spoilage, and describe the differences you see on days 5, 10, and 14.
- (d) Visit a place where radioisotopes are being used. Using a drawing, explain how and why they are used.
5. Do ONE of the following; then discuss with your counselor the principles of radiation safety:
- (a) Using a radiation survey meter and a radioactive source, show how the counts per minute change as the source gets closer to or farther from the radiation detector. Place three different materials between the source and the detector, then explain any differences in the measurements per minute. Explain how time, distance, and shielding can reduce an individual's radiation dose.
- (b) Describe how radon is detected in homes. Discuss the steps taken for the long-term and short-term test methods, tell how to interpret the results, and explain when each type of test should be used. Explain the health concern related to radon gas and tell what steps can be taken to reduce radon in buildings.
- (c) Visit a place where X-rays are used. Draw a floor plan of this room. Show where the unit, the unit operator, and the patient would be when the X-ray unit is operated. Explain the precautions taken and the importance of those precautions.
6. Do ONE of the following; then discuss with your counselor how nuclear energy is used to produce electricity:
- (a) Make a drawing showing how nuclear fission happens, labeling all details. Draw another picture showing how a chain reaction could be started and how it could be stopped. Explain what is meant by a "critical mass."
- (b) Build a model of a nuclear reactor. Show the fuel, control rods, shielding, moderator, and cooling material. Explain how a reactor could be used to change nuclear energy into electrical energy or make things radioactive.
- (c) Find out how many nuclear power plants exist in the United States. Locate the one nearest your home. Find out what percentage of electricity in the United States is generated by nuclear power plants, by coal, and by gas.
7. Give an example of each of the following in relation to how energy from an atom can be used: nuclear medicine, environmental applications, industrial applications, space exploration, and radiation therapy. For each example, explain the application and its significance to nuclear science.
8. Find out about three career opportunities in nuclear science that interest you. Pick one and find out the education, training, and experience required for this profession and discuss this with your counselor. Tell why this profession interests you.



## Oceanography

1. Name four branches of oceanography. Describe at least five reasons why it is important for people to learn about the oceans.
2. Define salinity, temperature, and density, and describe how these important properties of seawater are measured by the physical oceanographer. Discuss the circulation and currents of the ocean. Describe the effects of the oceans on weather and climate.
3. Describe the characteristics of ocean waves. Point out the differences among the storm surge, tsunami, tidal wave, and tidal bore. Explain the difference between sea, swell, and surf. Explain how breakers are formed.
4. Draw a cross-section of underwater topography. Show what is meant by:
  - (a) Continental shelf
  - (b) Continental slope
  - (c) Abyssal plain

Name and put on your drawing the following: seamount, guyot, rift valley, canyon, trench, and oceanic ridge. Compare the depths in the oceans with the heights of mountains on land.

5. List the main salts, gases, and nutrients in seawater. Describe some important properties of water. Tell how the animals and plants of the ocean affect the chemical composition of seawater. Explain how differences in evaporation and precipitation affect the salt content of the oceans.
6. Describe some of the biologically important properties of seawater. Define benthos, nekton, and plankton. Name some of the plants and animals that make up each of these groups. Describe the place and importance of phytoplankton in the oceanic food chain.
7. Do ONE of the following:
  - (a) Make a plankton net.\* Tow the net by a dock, wade with it, hold it in a current, or tow it from a rowboat. Do this for about 20 minutes. Save the sample. Examine it under a microscope or high-power glass. Identify the three most common types of plankton in the sample.
  - (b) Make a series of models (clay or plaster and wood) of a volcanic island. Show the growth of an atoll from a fringing reef through a barrier reef. Describe the Darwinian theory of coral reef formation.

\*May be done in lakes or streams.



- (c) Measure the water temperature at the surface, midwater, and bottom of a body of water four times daily for five consecutive days. You may measure depth with a rock tied to a line. Make a Secchi disk to measure turbidity (how much suspended sedimentation is in the water). Measure the air temperature. Note the cloud cover and roughness of the water. Show your findings (air and water temperature, turbidity) on a graph. Tell how the water temperature changes with air temperature.
- (d) Make a model showing the inshore sediment movement by littoral currents, tidal movement, and wave action. Include such formations as high and low waterlines, low-tide terrace, berm, and coastal cliffs. Show how offshore bars are built up and torn down.
- (e) Make a wave generator. Show reflection and refraction of waves. Show how groins, jetties, and breakwaters affect these patterns.
- (f) Track and monitor satellite images available on the Internet for a specific location for three weeks. Describe what you have learned to your counselor.
8. Do ONE of the following:
- (a) Write a 500-word report on a book about oceanography approved by your counselor.
- (b) Visit one of the following:
- (1) Oceanographic research ship
  - (2) Oceanographic institute
- Write a 500-word report about your visit.
- (c) Explain to your troop in a five-minute prepared speech “Why Oceanography Is Important” or describe “Career Opportunities in Oceanography.” (Before making your speech, show your speech outline to your counselor for approval.)
9. Describe four methods that marine scientists use to investigate the ocean, underlying geology, and organisms living in the water.
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## Orienteering

1. Show that you know first aid for the types of injuries that could occur while orienteering, including cuts, scratches, blisters, snakebite, insect stings, tick bites, heat and cold reactions (sunburn, heatstroke, heat exhaustion, hypothermia), and dehydration. Explain to your counselor why you should be able to identify poisonous plants and poisonous animals that are found in your area.
2. Explain what orienteering is.
3. Do the following:
  - (a) Explain how a compass works. Describe the features of an orienteering compass.
  - (b) In the field, show how to take a compass bearing and follow it.

4. Do the following:
  - (a) Explain how a topographic map shows terrain features. Point out and name five terrain features on a map and in the field.
  - (b) Point out and name 10 symbols on a topographic map.
  - (c) Explain the meaning of *declination*. Tell why you must consider declination when using map and compass together.
  - (d) Show a topographic map with magnetic north-south lines.
  - (e) Show how to measure distances on a map using an orienteering compass.
  - (f) Show how to orient a map using a compass.
5. Set up a 100-meter pace course. Determine your walking and running pace for 100 meters. Tell why it is important to pace-count.
6. Do the following:
  - (a) Identify 20 international control description symbols. Tell the meaning of each symbol.
  - (b) Show a control description sheet and explain the information provided.
  - (c) Explain the following terms and tell when you would use them: attack point, collecting feature, aiming off, contouring, reading ahead, handrail, relocation, rough versus fine orienteering.
7. Do the following:
  - (a) Take part in three orienteering events. One of these must be a cross-country course.\*
  - (b) After each event, write a report with (1) a copy of the master map and control description sheet, (2) a copy of the route you took on the course, (3) a discussion of how you could improve your time between control points, and (4) a list of your major weaknesses on this course. Describe what you could do to improve.
8. Do ONE of the following:
  - (a) Set up a cross-country course that is at least 2,000 meters long with at least five control markers. Prepare the master map and control description sheet.
  - (b) Set up a score orienteering course with at least 12 control points and a time limit of at least 60 minutes. Set point values for each control. Prepare the master map and control description sheet.
9. Act as an official during an orienteering event. This may be during the running of the course you set up for requirement 8.
10. Teach orienteering techniques to your patrol, troop, or crew.

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\*Note to the Counselor: While orienteering is primarily an individual sport, BSA Youth Protection procedures call for using the buddy system. Requirement 7a can be completed by pairs or groups of Scouts.



# P



## Painting

1. Explain the proper safety procedures to follow when preparing surfaces and applying coatings.
2. Do the following:
  - (a) Explain three ways that coatings can improve a surface.
  - (b) Explain the differences between oil-based paints, acrylic-based paints, and water-based paints.
  - (c) Explain where you would apply enamel paint, flat paint, wood stain, and varnish, and explain the importance of sheen.
  - (d) Tell why each is best for these uses.
3. Prepare and paint two different surfaces using patching material, caulking, and the proper primers and topcoats. Suggested projects include an interior or exterior wall, a door, a piece of furniture, a concrete wall or floor, a porch rail, or a fence. Your counselor must preapprove the projects.
4. Prepare and paint an item using harmonizing colors that you have selected using the color wheel in the *Painting* merit badge pamphlet.
5. Show the right way to use, clean, maintain, and store painting equipment.
6. Explain the importance of ladder safety, environmental responsibility, and personal hygiene when painting.
7. Explain some of the environmental and health issues concerning removing paint, applying paint, and discarding old paint.
8. Find out about career opportunities in the paint industry. Discuss the training and experience required, and explain why this profession might interest you.



## Personal Fitness

If meeting any of the requirements for this merit badge is against the Scout's religious convictions, the requirement does not have to be done if the Scout's parents and the proper religious advisers state in writing that to do so would be against religious convictions. The Scout's parents must also accept full responsibility for anything that might happen because of this exemption.

1. Do the following:

(a) Before completing requirements 2 through 9, have your health-care practitioner give you a physical examination, using the Scout medical examination form. Describe the examination. Tell what questions you were asked about your health. Tell what health or medical recommendations were made and report what you have done in response to the recommendations. Explain the following:

- (1) Why physical exams are important
- (2) Why preventive habits (such as exercising regularly) are important in maintaining good health, and how the use of tobacco products, alcohol, and other harmful substances can negatively affect your personal fitness
- (3) Diseases that can be prevented and how
- (4) The seven warning signs of cancer
- (5) The youth risk factors that affect cardiovascular fitness in adulthood

(b) Have a dental examination. Get a statement saying that your teeth have been checked and cared for. Tell how to care for your teeth.

2. Explain to your merit badge counselor verbally or in writing what personal fitness means to you, including

- (a) Components of personal fitness.
- (b) Reasons for being fit in all components.
- (c) What it means to be mentally healthy.
- (d) What it means to be physically healthy and fit.
- (e) What it means to be socially healthy. Discuss your activity in the areas of healthy social fitness.
- (f) What you can do to prevent social, emotional, or mental problems.

3. With your counselor, answer and discuss the following questions:

- (a) Are you free from all curable diseases? Are you living in such a way that your risk of preventable diseases is minimized?
- (b) Are you immunized and vaccinated according to the advice of your health-care provider?
- (c) Do you understand the meaning of a nutritious diet and know why it is important for you? Does your diet include foods from all food groups?

- (d) Are your body weight and composition what you would like them to be, and do you know how to modify them safely through exercise, diet, and behavior modification?
  - (e) Do you carry out daily activities without noticeable effort? Do you have extra energy for other activities?
  - (f) Are you free from habits relating to poor nutrition and the use of alcohol, tobacco, drugs, and other practices that could be harmful to your health?
  - (g) Do you participate in a regular exercise program or recreational activities?
  - (h) Do you sleep well at night and wake up feeling refreshed and energized for the new day?
  - (i) Are you actively involved in the religious organization of your choice, and do you participate in their youth activities?
  - (j) Do you spend quality time with your family and friends in social and recreational activities?
  - (k) Do you support family activities and efforts to maintain a good home life?
4. Explain the following about physical fitness:
- (a) The components of physical fitness
  - (b) Your weakest and strongest component of physical fitness
  - (c) The need to have a balance in all four components of physical fitness
  - (d) How the components of personal fitness relate to the Scout Law and Scout Oath
5. Explain the following about nutrition:
- (a) The importance of good nutrition
  - (b) What good nutrition means to you
  - (c) How good nutrition is related to the other components of personal fitness
  - (d) The three components of a sound weight (fat) control program
6. Before doing requirements 7 and 8, complete the aerobic fitness, flexibility, muscular strength, and body composition tests as described in the *Personal Fitness* merit badge pamphlet. Record your results and identify those areas where you feel you need to improve.

### **Aerobic Fitness Test**

Record your performance on ONE of the following tests:

- (a) Run/walk as far as you can in nine minutes.
- (b) Run/walk 1 mile as fast as you can.

### **Flexibility Test**

Using a sit-and-reach box constructed according to specifications in the *Personal Fitness* merit badge pamphlet, make four repetitions and record the fourth reach. This last reach must be held steady for 15 seconds to qualify. (Remember to keep your knees down.)

## Strength Tests

Record your performance on all three tests.

- (a) **Sit-Ups.** Record the number of sit-ups done correctly in 60 seconds. The sit-ups must be done in the form explained and illustrated in the *Personal Fitness* merit badge pamphlet.
- (b) **Pull-Ups.** Record the total number of pull-ups completed correctly in 60 seconds. Be consistent with the procedures presented in the *Personal Fitness* merit badge pamphlet.
- (c) **Push-Ups.** Record the total number of push-ups completed correctly in 60 seconds. Be consistent with the procedures presented in the *Personal Fitness* merit badge pamphlet.

## Body Composition Test

Have your parent, counselor, or other adult take and record the following measurements:

- (a) Circumference of the right upper arm, midway between the shoulder and the elbow, with the arm hanging naturally and not flexed.
- (b) Shoulders, with arms hanging by placing the tape measure 2 inches below the top of the shoulders around the arms, chest, and back after breath expiration.
- (c) Chest, by placing the tape under the arms and around the chest and back at the nipple line after breath expiration.
- (d) Abdomen circumference at the navel level (relaxed).
- (e) Circumference of the right thigh, midway between the hip and knee, and not flexed.

If possible, have the same person take the measurements whenever they are recorded.

7. Outline a comprehensive 12-week physical fitness program using the results of your fitness tests. Be sure your program incorporates the endurance, intensity, and warm-up guidelines discussed in the *Personal Fitness* merit badge pamphlet. Before beginning your exercises, have the program approved by your counselor and parents.
8. Complete the physical fitness program you outlined in requirement 7. Keep a log of your fitness program activity (how long you exercised; how far you ran, swam, or biked; how many exercise repetitions you completed; your exercise heart rate; etc.). Repeat the aerobic fitness, muscular strength, and flexibility tests every two weeks and record your results. After the 12th week, repeat all four tests, record your results, and show improvement in each one. Compare and analyze your preprogram and postprogram body composition measurements. Discuss the meaning and benefit of your experience, and describe your long-term plans regarding your personal fitness.
9. Find out about three career opportunities in personal fitness. Pick one and find out the education, training, and experience required for this profession. Discuss what you learned with your counselor, and explain why this profession might interest you.



## Personal Management

1. Do the following:
  - (a) Choose an item that your family might want to purchase that is considered a major expense.
  - (b) Write a plan that tells how your family would save money for the purchase identified in requirement 1a.
    - (1) Discuss the plan with your merit badge counselor.
    - (2) Discuss the plan with your family.
    - (3) Discuss how other family needs must be considered in this plan.
  - (c) Develop a written shopping strategy for the purchase identified in requirement 1a.
    - (1) Determine the quality of the item or service (using consumer publications or ratings systems).
    - (2) Comparison shop for the item. Find out where you can buy the item for the best price. (Provide prices from at least two different price sources.) Call around; study ads. Look for a sale or discount coupon. Consider alternatives. Can you buy the item used? Should you wait for a sale?
2. Do the following:
  - (a) Prepare a budget reflecting your expected income (allowance, gifts, wages), expenses, and savings. Track your actual income, expenses, and savings for 13 consecutive weeks. (You may use the forms provided in the merit badge pamphlet, devise your own, or use a computer-generated version.) When complete, present the results to your merit badge counselor.
  - (b) Compare expected income with expected expenses.
    - (1) If expenses exceed income, determine steps to balance your budget.
    - (2) If income exceeds expenses, state how you would use the excess money (new goal, savings).
3. Discuss with your merit badge counselor FIVE of the following concepts:
  - (a) The emotions you feel when you receive money.
  - (b) Your understanding of how the amount of money you have with you affects your spending habits.
  - (c) Your thoughts when you buy something new and your thoughts about the same item three months later. Explain the concept of buyer's remorse.
  - (d) How hunger affects you when shopping for food items (snacks, groceries).
  - (e) Your experience of an item you have purchased after seeing or hearing advertisements for it. Did the item work as well as advertised?

- (f) Your understanding of what happens when you put money into a savings account.
  - (g) Charitable giving. Explain its purpose and your thoughts about it.
  - (h) What you can do to better manage your money.
4. Explain the following to your merit badge counselor:
- (a) The differences between saving and investing, including reasons for using one over the other.
  - (b) The concepts of return on investment and risk.
  - (c) The concepts of simple interest and compound interest and how these affected the results of your investment exercise.
5. Select five publicly traded stocks from the business section of the newspaper. Explain to your merit badge counselor the importance of the following information for each stock:
- (a) Current price
  - (b) How much the price changed from the previous day
  - (c) The 52-week high and the 52-week low prices
6. Pretend you have \$1,000 to save, invest, and help prepare yourself for the future. Explain to your merit badge counselor the advantages or disadvantages of saving or investing in each of the following:
- (a) Common stocks
  - (b) Mutual funds
  - (c) Life insurance
  - (d) A certificate of deposit (CD)
  - (e) A savings account or U.S. savings bond
7. Explain to your merit badge counselor the following:
- (a) What a loan is, what interest is, and how the annual percentage rate (APR) measures the true cost of a loan.
  - (b) The different ways to borrow money.
  - (c) The differences between a charge card, debit card, and credit card. What are the costs and pitfalls of using these financial tools? Explain why it is unwise to make only the minimum payment on your credit card.
  - (d) Credit reports and how personal responsibility can affect your credit report.
  - (e) Ways to reduce or eliminate debt.
8. Demonstrate to your merit badge counselor your understanding of time management by doing the following:
- (a) Write a “to do” list of tasks or activities, such as homework assignments, chores, and personal projects, that must be done in the coming week. List these in order of importance to you.



- (b) Make a seven-day calendar or schedule. Put in your set activities, such as school classes, sports practices or games, jobs or chores, and/or Scout or church or club meetings, then plan when you will do all the tasks from your “to do” list between your set activities.
- (c) Follow the one-week schedule you planned. Keep a daily diary or journal during each of the seven days of this week’s activities, writing down when you completed each of the tasks on your “to do” list compared to when you scheduled them.
- (d) Review your “to do” list, one-week schedule, and diary/journal to understand when your schedule worked and when it did not work. With your merit badge counselor, discuss and understand what you learned from this requirement and what you might do differently the next time.
9. Prepare a written project plan demonstrating the steps below, including the desired outcome. This is a project on paper, not a real-life project. Examples could include planning a camping trip, developing a community service project or a school or religious event, or creating an annual patrol plan with additional activities not already included in the troop annual plan. Discuss your completed project plan with your merit badge counselor.
- (a) Define the project. What is your goal?
- (b) Develop a time line for your project that shows the steps you must take from beginning to completion.
- (c) Describe your project.
- (d) Develop a list of resources. Identify how these resources will help you achieve your goal.
- (e) If necessary, develop a budget for your project.
10. Do the following:
- (a) Choose a career you might want to enter after high school or college graduation.
- (b) Research the limitations of your anticipated career and discuss with your merit badge counselor what you have learned about qualifications such as education, skills, and experience.



## Pets

1. Present evidence that you have cared for a pet for four months. Get approval before you start.\*
2. Write in 200 words or more about the care, feeding, and housing of your pet. Tell some interesting facts about it. Tell why you have this kind of pet. Give local laws, if any, relating to the pet you keep.
3. Show that you have read a book or pamphlet, approved by your counselor, about your kind of pet.
4. Do any ONE of the following:
  - (a) Show your pet in some pet show.
  - (b) Start a friend raising a pet like yours. Help your friend get a good start.
  - (c) Train a pet in three or more tricks or special abilities.

\*Work done for other merit badges cannot be used for this requirement.

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## Photography

1. Explain how the following elements and terms affect the quality of a picture:
  - (a) Light—natural light/ambient, flash
  - (b) Exposure—aperture (f-stops), shutter speed, depth of field
  - (c) Composition—rule of thirds, leading lines, framing, depth
  - (d) Angle of view
  - (e) Stopping action
2. Explain the basic parts and operation of a film camera or digital camera. Explain how an exposure is made when you take a picture.
3. Discuss with your counselor the differences between a film camera and a digital camera. List at least five advantages and five disadvantages of using a digital camera versus using a film camera.
4. Do ONE of the following:
  - (a) Produce a picture story using the photojournalistic technique of documenting an event. Share your plan with your counselor and get your counselor's input and approval before you proceed. Then, using either a film camera or

a digital camera, produce your approved picture story. Process your images and select eight to 12 images that best tell your story. Arrange your images in order, then mount the prints on a poster board. If you are using digital images, you may create a slide show on your computer or produce printouts for your poster board. Share your picture story with your counselor.

(b) Choose a topic that interests you to photograph for an exhibit or display. Get your counselor's approval, then photograph (digital or film) your topic. Process your images. Choose 20 of your favorite images and mount them on poster board. Share your display with your counselor. If you are using digital images, you may create a slide show on your computer or produce printouts for your poster board.

5. Discuss with your counselor the career opportunities in photography. Pick one that interests you and explain how to prepare for such a career. Discuss with your counselor the education and training such a career would require.



## Pioneering

1. Show that you know first aid for injuries or illness that could occur while working on pioneering projects, including minor cuts and abrasions, bruises, rope burns, blisters, splinters, sprains, heat and cold reactions, dehydration, and insect bites or stings.
2. Do the following:
  - (a) Successfully complete Tenderfoot requirements 4a and 4b and First Class requirements 7a, 7b, and 8a. (These are the rope-related requirements.)
  - (b) Tie the following: square knot, bowline, sheepshank, sheet bend, and roundturn with two half hitches.
  - (c) Demonstrate the following: tripod and round lashings.
3. Explain why it is useful to be able to throw a rope, then demonstrate how to coil and throw a 40-foot length of  $\frac{1}{4}$ - or  $\frac{3}{8}$ -inch rope. Explain how to improve your throwing distance by adding weight to the end of your rope.
4. Explain the differences between synthetic ropes and natural-fiber ropes. Discuss which types of rope are suitable for pioneering work and why. Include the following in your discussion: breaking strength, safe working loads, and the care and storage of rope.
5. Explain the uses for the back splice, eye splice, and short splice. Using  $\frac{1}{4}$ - or  $\frac{3}{8}$ -inch three-stranded rope, demonstrate how to form each splice.
6. Using a rope-making device or machine, make a rope at least 6 feet long consisting of three strands, each having three yarns.

7. Build a scale model of a signal tower or a monkey bridge. Correctly anchor the model using either the 1-1-1 anchoring system or the log and stake anchoring method. Describe the design of your project and explain how the anchoring system works.
  8. Demonstrate the use of a rope tackle by lifting a weight of 25 pounds and pulling a log at least 6 inches in diameter and 6 feet long with the tackle. Use the tackle to put tension on a line. Explain the advantages and limitations of using a rope tackle. In your explanation, describe the potential damage that friction can do to a rope.
  9. By yourself, build an A-trestle OR X-trestle OR H-trestle using square and diagonal lashings. Explain the application of the trestle you build. Demonstrate how to tie two spars together using a shear lashing.
  10. With a group of Scouts OR on your own, select a pioneering project and get your counselor's approval before you begin building. With your counselor's guidance, create a rough sketch of the project. Make a list of the ropes and spars needed, then build the project. (Note: This requirement may be done at summer camp, at district or council events, or on a troop camp outing.)
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## Plant Science

1. Make a drawing and identify five or more parts of a flowering plant. Tell what each part does.
2. Explain photosynthesis and tell why this process is important. Tell at least five ways that humans depend on plants.
3. Explain how water, light, air, temperature, pollinators, and pests affect plants. Describe the nature and function of soil and explain its importance. Tell about the texture, structure, and composition of fertile soil. Tell how soil may be improved.
4. Tell how to propagate plants by seeds, roots, cuttings, tubers, and grafting. Grow a plant by ONE of these methods.
5. List by common name at least 10 native plants and 10 cultivated plants that grow near your home. List five invasive nonnative plants in your area and tell how they may be harmful. Tell how the spread of invasive plants may be avoided or controlled in ways that are not damaging to humans, wildlife, and the environment.
6. Name and tell about careers in agronomy, horticulture, and botany. Write a paragraph about a career in one of these fields that interests you.
7. Choose ONE of the following options and complete each requirement:

## Option 1: Agronomy

- A. Describe how to prepare a seedbed.
- B. Make and use a seed germination tester to test 50 seeds of four of the following plants: corn, cotton, alfalfa, soybeans, clover, wheat, rice, rye, barley. Determine the percentage of live seeds.
- C. Tell about one important insect pest and one important disease that damage each of the following: corn, small grains, cotton. Collect and name five weeds that compete with crops in your locality. Tell how to control these weeds without harming people, wildlife, or useful insects.
- D. On a map of the United States, identify the chief regions where corn, cotton, forage crops, small grain crops, and oil crops grow. Tell how climate and location of these regions make them leaders in the production of these crops.
- E. Complete ONE of the following alternatives:
  - (1) Corn
    - (a) Grow a plot of corn and have your plot inspected by your counselor. Record seed variety or experimental code number.
    - (b) Tell about modern methods of commercial corn farming and the contributions that corn makes to today's food and fuel supply.
    - (c) Tell about an insect that can damage corn, and explain how it affects corn production and how it is controlled.
  - (2) Cotton
    - (a) Grow a plot of cotton and have your plot inspected by your counselor.
    - (b) Tell about modern methods of commercial cotton farming, and about the uses of cotton fiber and seed and the economic value of this crop.
    - (c) Tell about an insect that can damage cotton, and explain how it affects cotton production and how it is controlled.
  - (3) Forage Crops
    - (a) Collect, count, and label samples of each for display: perennial grasses, annual grasses, legumes, and broadleaf weeds. Indicate how each grass and legume is used. Tell the kind of site where you found each sample.
    - (b) Explain how legumes can be used to enrich the soil and how they may deplete it under certain conditions. Explain how livestock may enrich or deplete the soil.
    - (c) Name five poisonous plants that are dangerous to livestock, and tell the different ways of using forage crops as feed for livestock.

(4) Small Grains

- (a) Give production figures for small grain crops listed in the U.S. Statistical Report or Agricultural Statistics Handbook for the latest year available.
- (b) Help in harvesting a crop of grain. Tell how to reduce harvesting losses and about modern methods of growing one small grain crop.
- (c) Visit a grain elevator, flour mill, cereal plant, feed or seed company. Talk with the operator. Take notes, and describe the processes used and tell your patrol, troop, or class about your visit.

(5) Oil Crops

- (a) Grow a plot of soybeans and have your plot inspected by your counselor.
- (b) Tell about modern methods of growing soybeans on a commercial scale, and discuss the contributions soybeans make to our food supply.
- (c) Explain why a killing frost just after emergence is critical for soybeans.

## Option 2: Horticulture

- A. Visit one of the following places and tell what you learned about horticulture there: public garden, arboretum, retail nursery, wholesale nursery, production greenhouse, or conservatory greenhouse.
- B. Explain the following terms: hardiness zone, shade tolerance, pH, moisture requirement, native habitat, texture, cultivar, ultimate size, disease resistance, habit, evergreen, deciduous, annual, perennial. Find out what hardiness zone you live in and list 10 landscape plants you like that are suitable for your climate, giving the common name and scientific name for each.
- C. Do ONE of the following:
  - (1) Explain the difference between vegetative and sexual propagation methods, and tell some horticultural advantages of each. Grow a plant from a stem or root cutting or graft.
  - (2) Transplant 12 seedlings or rooted cuttings to larger containers and grow them for at least one month.
  - (3) Demonstrate good pruning techniques and tell why pruning is important.
  - (4) After obtaining permission, plant a tree or shrub properly in an appropriate site.
- D. Do EACH of the following:
  - (1) Explain the importance of good landscape design and selection of plants that are suitable for particular sites and conditions.
  - (2) Tell why it is important to know how big a plant will grow.

(3) Tell why slower-growing landscape plants are sometimes a better choice than faster-growing varieties.

E. Choose ONE of the following alternatives and complete EACH of the requirements:

(1) Bedding Plants

(a) Grow bedding plants appropriate for your area in pots or flats from seed or cuttings in a manufactured soil mix. Explain why you chose the mix and tell what is in it.

(b) Transplant plants to a bed in the landscape and maintain the bed until the end of the growing season. Record your activities, observations, materials used, and costs.

(c) Demonstrate mulching, fertilizing, watering, weeding, and deadheading, and tell how each practice helps your plants.

(d) Tell some differences between gardening with annuals and perennials.

(2) Fruit, Berry, and Nut Crops

(a) Plant five fruit or nut trees, grapevines, or berry plants that are suited to your area. Take full care of fruit or nut trees, grapevines, or berry plants through one season.

(b) Prune a tree, vine, or shrub properly. Explain why pruning is necessary.

(c) Demonstrate one type of graft and tell why this method is useful.

(d) Describe how one fruit, nut, or berry crop is processed for use.

(3) Woody Ornamentals

(a) Plant five or more trees or shrubs in a landscape setting. Take full care of the trees or shrubs you have planted for one growing season.

(b) Prune a tree or shrub properly. Explain why pruning is necessary.

(c) List 10 trees (in addition to those listed in general requirement 5 above) and tell your counselor how each is used in the landscape. Give the common and scientific names.

(d) Describe the size, texture, color, flowers, leaves, fruit, hardiness, cultural requirements, and any special characteristics that make each type of tree or shrub attractive or interesting.

(e) Tell five ways trees help improve the quality of our environment.

(4) Home Gardening

(a) Design and plant a garden or landscape that is at least 10 by 10 feet.

(b) Plant 10 or more different types of plants in your garden. Tell why you selected particular varieties of vegetables and flowers. Take care of the plants in your garden for one season.

(c) Demonstrate soil preparation, staking, watering, weeding, mulching, composting, fertilizing, pest management, and pruning. Tell why each technique is used.

(d) Tell four types of things you could provide to make your home landscape or park a better place for birds and wildlife. List the common and scientific names of 10 kinds of native plants that are beneficial to birds and wildlife in your area.

### Option 3: Field Botany

- A. Visit a park, forest, or other natural area near your home. While you are there:
- (1) Determine which species of plants are the largest and which are the most abundant. Note whether they cast shade on other plants.
  - (2) Record environmental factors that may influence the presence of plants on your site, including latitude, climate, air and soil temperature, soil type and pH, geology, hydrology, and topography.
  - (3) Record any differences in the types of plants you see at the edge of a forest, near water, in burned areas, or near a road or railroad.
- B. Select a study site that is at least 100 by 100 feet. Make a list of the plants in the study site by groups of plants: canopy trees, small trees, shrubs, herbaceous wildflowers and grasses, vines, ferns, mosses, algae, fungi, lichens. Find out which of these are native plants and which are exotic (or nonnative).
- C. Tell how an identification key works and use a simple key to identify 10 kinds of plants (in addition to those in general requirement 5 above). Tell the difference between common and scientific names and tell why scientific names are important.
- D. After gaining permission, collect, identify, press, mount, and label 10 different plants that are common in your area. Tell why voucher specimens are important for documentation of a field botanist's discoveries.
- E. Obtain a list of rare plants of your state. Tell what is being done to protect rare plants and natural areas in your state. Write a paragraph about one of the rare plants in your state.
- F. Choose ONE of the following alternatives and complete EACH of its requirements:
- (1) Tree Inventory
    - (a) Identify the trees of your neighborhood or a park or section of your town.
    - (b) Collect, press, and label leaves, flowers, or fruits to document your inventory.
    - (c) List the types of trees by scientific name and give common names. Note the number and size (diameter at 4 feet above ground) of trees observed and determine the largest of each species in your study area.



(d) Lead a walk to teach others about trees and their value, OR write and distribute materials that will help others learn about trees.

(2) Transect Study

(a) Visit two sites, at least one of which is different from the one you visited for Field Botany requirement 1.

(b) Use the transect method to study the two different kinds of plant communities. The transects should be at least 500 feet long.

(c) At each site, record observations about the soil and other influencing factors AND do the following. Then make a graph or chart to show the results of your studies.

(1) Identify each tree within 10 feet of the transect line.

(2) Measure the diameter of each tree at 4 feet above the ground, and map and list each tree.

(3) Nested Plot

(a) Visit two sites, at least one of which is different from the one you visited for Field Botany requirement 1.

(b) Mark off nested plots and inventory two different kinds of plant communities.

(c) At each site, record observations about the soil and other influencing factors AND do the following. Then make a graph or chart to show the results of your studies.

(1) Identify, measure, and map each tree in a 100-by-100-foot plot. (Measure the diameter of each tree at 4 feet above the ground.)

(2) Identify and map all trees and shrubs in a 10-by-10-foot plot within each of the larger areas.

(3) Identify and map all plants (wildflowers, ferns, grasses, mosses, etc.) of a 4-by-4-foot plot within the 10-by-10-foot plot.

(4) Herbarium Visit

(a) Write ahead and arrange to visit an herbarium at a university, park, or botanical garden; OR, visit an herbarium Web site (with your parent's permission).

(b) Tell how the specimens are arranged and how they are used by researchers. If possible, observe voucher specimens of a plant that is rare in your state.

(c) Tell how a voucher specimen is mounted and prepared for permanent storage. Tell how specimens should be handled so that they will not be damaged.

(d) Tell about the tools and references used by botanists in an herbarium.

(5) Plant Conservation Organization Visit

(a) Write ahead and arrange to visit a private conservation organization or government agency that is concerned with protecting rare plants and natural areas.

(b) Tell about the activities of the organization in studying and protecting rare plants and natural areas.

(c) If possible, visit a nature preserve managed by the organization. Tell about land management activities such as controlled burning, or measures to eradicate invasive (nonnative) plants or other threats to the plants that are native to the area.



## Plumbing

1. Do the following:
  - (a) Describe how a properly working plumbing system protects your family's health and safety.
  - (b) List five important local health regulations related to plumbing and tell how they protect health and safety.
  - (c) Describe the safety precautions you must take when making home plumbing repairs.
2. Do the following:
  - (a) Make a drawing and explain how a home hot- and cold-water supply system works. Tell how you would make it safe from freezing.
  - (b) Make a drawing and explain the drainage system of the plumbing in a house. Show and explain the use of drains and vents.
3. Show how to use five important plumber's tools.
4. Identify and describe the use of each of the following: washer, retaining nut, plunger (rubber force cup), solder, flux, elbow, tee, nipple, coupling, plug, union, trap, drainpipe, and water meter.
5. Name the kinds of pipe that are used most often in a plumbing system. Explain why these pipes are used.
6. Cut, thread, and connect two pieces of steel pipe.
7. Under the supervision of a knowledgeable adult, solder three copper tube connections using a gas torch. Include one tee, two straight pieces, and one coupling.
8. Do the following:
  - (a) Replace a washer in a faucet.
  - (b) Clean out a sink or lavatory trap.



## Pottery

1. Explain to your counselor the precautions that must be followed for the safe use and operation of a potter's tools, equipment, and other materials.
2. Do the following:
  - (a) Explain the properties and ingredients of a good clay body for the following:
    - (1) Making sculpture
    - (2) Throwing on the wheel
  - (b) Tell how three different kinds of potter's wheels work.
3. Make two drawings of pottery forms, each on an 8½-by-11-inch sheet of paper. One must be a historical pottery style. The other must be of your own design.
4. Explain the meaning of the following pottery terms: bat, wedging, throwing, leather hard, bone dry, greenware, bisque, terra-cotta, grog, slip, score, earthenware, stoneware, porcelain, pyrometric cone, and glaze.
5. Do the following. Each piece is to be painted, glazed, or otherwise decorated by you:
  - (a) Make a slab pot, a coil pot, and a pinch pot.
  - (b) Make a human or animal figurine or decorative sculpture.
  - (c) Throw a functional form on a potter's wheel.
  - (d) Help to fire a kiln.
6. Explain the scope of the ceramic industry in the United States. Tell some things made other than craft pottery.
7. With your parent's permission and your counselor's approval, do ONE of the following:
  - (a) Visit the kiln yard at a local college or other craft school. Learn how the different kinds of kilns work, including low fire electric, gas or propane high fire, wood or salt/soda, and raku.
  - (b) Visit a museum, art exhibit, art gallery, artists' co-op, or artist's studio that features pottery. After your visit, share with your counselor what you have learned.
  - (c) Using resources from the library, magazines, the Internet (with your parent's permission), and other outlets, learn about the historical and cultural importance of pottery. Share what you discover with your counselor.
8. Find out about career opportunities in pottery. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.



## Public Health

1. Explain what public health is. Explain how *Escherichia coli* (*E. coli*), tetanus, AIDS, encephalitis, salmonellosis, and Lyme disease are contracted. Then, pick any four of the following diseases and explain how each one is contracted: gonorrhea, West Nile virus, botulism, influenza, syphilis, hepatitis, emphysema, meningitis, herpes, lead poisoning. For all 10 diseases, explain the type or form of the disease (viral, bacterial, environmental, toxin), any possible vectors for transmission, ways to help prevent the spread of infection, and available treatments.
2. Do the following:
  - (a) Explain the meaning of *immunization*.
  - (b) Name five diseases against which a young child should be immunized and two diseases against which everyone should be reimmunized periodically.
  - (c) Using the diseases you chose for requirement 1, discuss the diseases for which there is currently no treatment or immunization.
3. Discuss the importance of safe drinking water in terms of the spread of disease. Then, demonstrate two ways for making water safe to drink that can be used while at camp. In your demonstration, explain how dishes and utensils should be washed, dried, and kept sanitary at home and in camp.
4. Explain what a vector is and how insects and rodents can be controlled in your home, in your community, and at camp. Tell why this is important. In your discussion, explain which vectors can be easily controlled by individuals and which ones require long-term, collective action.
5. With your parent's and counselor's approval, do ONE of the following:
  - (a) Visit a municipal wastewater treatment facility OR a solid-waste management operation in your community. Describe how the facility safely treats and disposes of sewage or solid waste. Describe how sewage and solid waste should be disposed of under wilderness camping conditions.
  - (b) Arrange to meet with the food service manager of a food service facility (such as a restaurant or school cafeteria) and visit this establishment. Observe food preparation, handling, and storage, and learn how the facility keeps foods from becoming contaminated. Find out what conditions allow microorganisms to multiply in food and how conditions can be controlled to help prevent the growth and dissemination of microorganisms. Learn how microorganisms in food can be killed. Discuss what you learned with your counselor.
6. Do the following:
  - (a) Describe the health dangers from air, water, and noise pollution.
  - (b) Describe health dangers from tobacco use and alcohol and drug abuse.

7. With your parent's and counselor's approval, visit your city, county, or state public health agency. Discuss how the agency addresses the concerns raised in requirements 1 through 6 and how the services provided by this agency affect your family. Then do the following:
    - (a) Compare the four leading causes of mortality (death) in your community for any of the past five years with the four leading causes of morbidity (incidence of disease) in your community. Explain how the public health agency you visited is trying to reduce the mortality and morbidity rates of these leading causes of illness and death.
    - (b) Explain the role of the health agency you visited related to the outbreak of diseases.
    - (c) Discuss the kinds of public assistance the agency is able to provide in case of disasters such as floods, storms, tornadoes, earthquakes, and other acts of destruction. Your discussion can include the cleanup necessary after a disaster occurs.
  8. Pick a profession in the public health sector that interests you. Find out the education, training, and experience required to work in this profession. Discuss what you learn with your counselor.
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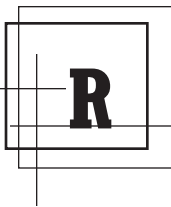
## Public Speaking

1. Give a three- to five-minute introduction of yourself to an audience such as your troop, class at school, or some other group.
2. Prepare a three- to five-minute talk on a topic of your choice that incorporates body language and visual aids.
3. Give an impromptu talk of at least two minutes either as part of a group discussion or before your counselor. Use a subject selected by your counselor that is interesting to you but that is not known to you in advance and for which you do not have time to prepare.
4. Select a topic of interest to your audience. Collect and organize information about the topic and prepare an outline. Write an eight- to 10-minute speech, practice it, then deliver it in a conversational way.
5. Show you know parliamentary procedure by leading a discussion or meeting according to accepted rules of order, or by answering questions on the rules of order.



## Pulp and Paper

1. Tell the history of papermaking. Describe the part paper products play in our society and economy.
2. List the trees that are major sources of papermaking fibers. Then discuss what other uses are made of the trees and of the forestland owned by the pulp and paper industry. Describe the ways the industry plants, grows, and harvests trees. Explain how the industry manages its forests so that the supply of trees keeps pace with the demand, and tell about one way the industry has incorporated a sustainable forestry concept. Give two ways the papermaking industry has addressed pollution.
3. Describe two ways of getting fibers from wood, and explain the major differences. Tell why some pulps are bleached, and describe this process.
4. Describe how paper is made. Discuss how paper is recycled. Make a sheet of paper by hand.
5. Explain what coated paper is and why it is coated. Describe the major uses for different kinds of coated papers. Describe one other way that paper is changed by chemical or mechanical means to make new uses possible.
6. Make a list of 15 pulp or paper products found in your home. Share examples of 10 such products with your counselor.
7. With your parent's and counselor's approval, do ONE of the following:
  - (a) Visit a pulp mill. Describe how the mill converts wood to cellulose fibers.
  - (b) Visit a paper mill and get a sample of the paper made there. Describe the processes used for making this paper. Tell how it will be used.
  - (c) Visit a container plant or box plant. Describe how the plant's products are made.
  - (d) Visit a recycled paper collection or sorting facility. Describe the operations there.
  - (e) Using books, magazines, your local library, the Internet (with your parent's permission), and any other suitable research tool, find out how paper products are developed. Find out what role research and development play in the papermaking industry. Share what you learn with your counselor.
8. Find out about three career opportunities in the papermaking industry that interest you. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.



## Radio

1. Explain what radio is. Then discuss the following:
  - (a) The differences between broadcast radio and hobby radio
  - (b) The differences between broadcasting and two-way communications
  - (c) Radio station call signs and how they are used in broadcast radio and amateur radio
  - (d) The phonetic alphabet and how it is used to communicate clearly
2. Do the following:
  - (a) Sketch a diagram showing how radio waves travel locally and around the world. Explain how the broadcast radio stations WWV and WWVH can be used to help determine what you will hear when you listen to a shortwave radio.
  - (b) Explain the difference between a DX and a local station. Discuss what the Federal Communications Commission (FCC) does and how it is different from the International Telecommunication Union.
3. Do the following:
  - (a) Draw a chart of the electromagnetic spectrum covering 100 kilohertz (kHz) to 1000 megahertz (MHz).
  - (b) Label the MF, HF, VHF, UHF, and microwave portions of the spectrum on your diagram.
  - (c) Locate on your chart at least eight radio services, such as AM and FM commercial broadcast, citizens band (CB), television, amateur radio (at least four amateur radio bands), and public service (police and fire).
4. Explain how radio waves carry information. Include in your explanation: transceiver, transmitter, receiver, amplifier, and antenna.
5. Do the following:
  - (a) Explain the differences between a block diagram and a schematic diagram.
  - (b) Draw a block diagram for a radio station that includes a transceiver, amplifier, microphone, antenna, and feed line.
  - (c) Explain the differences between an open circuit, a closed circuit, and a short circuit.
  - (d) Draw eight schematic symbols. Explain what three of the represented parts do. Find three electrical components to match to three of these symbols.

6. Explain the safety precautions for working with radio gear, including the concept of grounding for direct current circuits, power outlets, and antenna systems.
7. Visit a radio installation (an amateur radio station, broadcast station, or public service communications center, for example) approved in advance by your counselor. Discuss what types of equipment you saw in use, how it was used, what types of licenses are required to operate and maintain the equipment, and the purpose of the station.
8. Find out about three career opportunities in radio. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.
9. Do ONE of the following (a OR b OR c):

(a) **Amateur Radio**

(1) Tell why the FCC has an amateur radio service. Describe some of the activities that amateur radio operators can do on the air, once they have earned an amateur radio license.

(2) Using proper call signs, Q signals, and abbreviations, carry on a 10-minute real or simulated amateur radio contact using voice, Morse code, or digital mode. (Licensed amateur radio operators may substitute five QSL cards as evidence of contacts with amateur radio operators from at least three different call districts.) Properly log the real or simulated ham radio contact and record the signal report.

(3) Explain at least five Q signals or amateur radio terms you hear while listening.

(4) Explain some of the differences between the Technician, General, and Extra Class license requirements and privileges. Explain who administers amateur radio exams.

(5) Explain how you would make an emergency call on voice or Morse code.

(6) Explain the differences between handheld transceivers and home “base” transceivers. Explain the uses of mobile amateur radio transceivers and amateur radio repeaters.

(b) **Broadcast Radio**

(1) Prepare a program schedule for radio station “KBSA” of exactly one-half hour, including music, news, commercials, and proper station identification. Record your program on audiotape or in a digital audio format, using proper techniques.

(2) Listen to and properly log 15 broadcast stations. Determine the program format and target audience for five of these stations.

(3) Explain at least eight terms used in commercial broadcasting, such as segue, cut, fade, continuity, remote, Emergency Alert System, network, cue, dead air, PSA, and playlist.

(c) **Shortwave Listening**

- (1) Listen across several shortwave bands for four one-hour periods—at least one period during daylight hours and at least one period at night. Log the stations properly and locate them geographically on a globe.



- (2) For several major foreign stations (BBC in Great Britain or HCJB in Ecuador, for example), list several frequency bands used by each.
  - (3) Compare your daytime and nighttime logs; note the frequencies on which your selected stations were loudest during each session. Explain differences in the signal strength from one period to the next.
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## Railroading

1. Do THREE of the following:
  - (a) Name three types of modern freight trains. Explain why unit trains are more efficient than mixed freight trains.
  - (b) Name one class I or regional railroad. Explain what major cities it serves, the locations of major terminals, service facilities and crew change points, and the major commodities it carries.
  - (c) Using models or pictures, identify 10 types of railroad freight or passenger cars. Explain the purpose of each type of car.
  - (d) Explain how a modern diesel or electric locomotive develops power. Explain the terms dynamic braking and radial steering trucks.
2. Do the following:
  - (a) Explain the purpose and formation of Amtrak. Explain, by the use of a timetable, a plan for making a trip by rail between two cities at least 500 miles apart. List the times of departure and arrival at your destination, the train number and name, and the type of service you want.
  - (b) List and explain the various forms of public/mass transit using rail as the fixed-guide path.
3. Do ONE of the following:
  - (a) Name four departments of a railroad company. Describe what each department does.
  - (b) Tell about the opportunities in railroading that interest you most and why.
  - (c) Name four rail support industries. Describe the function of each one.
  - (d) With your parent's and counselor's approval, interview someone employed in the rail industry. Learn what that person does and how this person became interested in railroading. Find out what type of schooling and training are required for this position.
4. Explain the purpose of Operation Lifesaver and its mission.
5. Do THREE of the following:
  - (a) List five safety precautions that help make trains safer for workers and passengers.

- (b) Explain to your merit badge counselor why railroad rights-of-way are important for safety.
  - (c) List 10 safety tips to remember when you are near a railroad track (either on the ground or on a station platform) or aboard a train.
  - (d) Tell your counselor about the guidelines for conduct that should be followed when you are near or on railroad property. Explain the dangers of trespassing on railroad property.
  - (e) Tell what an automobile driver can do to safely operate a car at grade crossings, and list three things an automobile driver should never do at a grade crossing.
  - (f) Tell how to report a malfunction of grade crossing warning devices.
  - (g) List safety precautions a pedestrian should follow at a public crossing.
6. Explain the appearance and meaning of the following warning signs and devices: advance warning sign, pavement markings, crossbucks, flashing red lights, crossing gates.
7. Do EACH of the following:
- (a) Explain how railroad signals operate and show two basic signal types using color or configuration.
  - (b) Explain the meaning of three whistle signals.
  - (c) Describe a way to signal a train for an emergency stop.
  - (d) Explain the use and function of the EOTD (end-of-train device) or FRED (flashing rear end device) used on the last car of most trains.
8. Select ONE of the following special-interest areas and complete the requirements.
- (a) **Model Railroading**

With your parent's and counselor's approval, do TWO of the following:

- (1) Draw a layout of your own model railroad or one that could be built in your home. Design a point-to-point track or loop with different routings. Include one of the following: turnaround or terminal or yard or siding.
- (2) Build one model railroad car kit or one locomotive kit.
- (3) Name the scale of four popular model railroad gauges. Identify the scale of four model cars or locomotives.
- (4) Locate the Web site of four model railroad-related manufacturers or magazine publishers. Print information on their products and services and discuss the information with your counselor.
- (5) Build one railroad structure (from scratch or using a kit), paint and weather the structure, mount it on your layout or diorama, and make the surrounding area on the diorama scenic.
- (6) Alone or with others, build a model railroad or modular layout including ballast and scenery. Make electrical connections and operate a train. Describe what you enjoyed most.

(7) Participate in a switching contest on a timesaver layout and record your time.

**(b) Railfanning**

With your parent's and counselor's approval, do TWO of the following:

- (1) Visit a railroad museum, historical display, or a prototype railroad-sponsored public event. With permission, photograph, videotape, or sketch items of interest. Explain what you saw and describe your photos, sketches, or videotape.
  - (2) Purchase tickets and ride a scenic or historic railroad. Under supervision, photograph the equipment and discuss with your counselor the historic significance of the operation.
  - (3) Locate the Web site of four rail historical groups, then find information on the history of the rail preservation operations and purpose of each group. Talk with a member of one of the groups and find out how you might help.
  - (4) Plan a trip by rail between two points. Obtain a schedule and explain when the train should arrive at two intermediate points. Purchase the tickets and make the trip. Explain to your counselor what you saw.
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## Reading

1. Do EACH of the following:

- (a) Learn how to search your library's card catalog or computerized catalog by author, title, and subject.
- (b) With the assistance of your merit badge counselor or a librarian, select six books of four different types (such as poetry, drama/plays, fiction, nonfiction, biographies, etc.). Ask your librarian or counselor about award-winning books that are recommended for readers your age and include at least one of those titles.
- (c) Find the books in the library catalog. With your counselor's or a librarian's assistance, locate the books on the shelves.
- (d) Read each book. Keep a log of your reading that includes the title of the book, the pages or chapters read, the date you completed them, and your thoughts about what you have read so far. Discuss your reading with your counselor. Using your log as a reference, explain why you chose each book and tell whether you enjoyed it and what it meant to you.

2. Read about the world around you from any two sources—books, magazines, newspapers, the Internet (with your parent's permission), field manuals, etc. Topics may include sports, environmental problems, politics, social issues, current events, nature, religion, etc. Discuss what you have learned with your counselor.

3. Do ONE of the following:
    - (a) From a catalog of your choice, fill out an order form for merchandise as if you intended to place an order. Share the completed form with your counselor and discuss it.
    - (b) With your parent's permission, locate at least five Web sites that are helpful for your Scouting or other activities. Write the Internet addresses of these sites in your log. Talk with your counselor or a librarian about safety rules for using the Internet.
  4. With your counselor's and your parent's permission, choose ONE of the following activities and devote at least four hours of service to that activity. Discuss your participation with your counselor.
    - (a) Read to a sick, blind, or homebound person in a hospital or in an extended-care facility.
    - (b) Perform volunteer work at your school library or a public library.
    - (c) Read stories to younger children, in a group or individually.
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## Reptile and Amphibian Study

1. Describe the identifying characteristics of six species of reptiles and four species of amphibians found in the United States. For any four of these, make sketches from your own observations or take photographs. Show markings, color patterns, or other characteristics that are important in the identification of each of the four species. Discuss the habits and habitats of all 10 species.
2. Discuss with your merit badge counselor the approximate number of species and general geographic distribution of reptiles and amphibians in the United States. Prepare a list of the most common species found in your local area or state.
3. Describe the main differences between
  - (a) Amphibians and reptiles
  - (b) Alligators and crocodiles
  - (c) Toads and frogs
  - (d) Salamanders and lizards
  - (e) Snakes and lizards
4. Explain how reptiles and amphibians are an important component of the natural environment. List four species that are officially protected by the federal government or by the state you live in, and tell why each is protected. List three species of reptiles and three species of amphibians found in your local area that are not protected. Discuss the food habits of all 10 species.
5. Describe how reptiles and amphibians reproduce.

6. From observation, describe how snakes move forward. Describe the functions of the muscles, ribs, and belly plates.
7. Describe in detail six venomous snakes and the one venomous lizard found in the United States. Describe their habits and geographic range. Tell what you should do in case of a bite by a venomous species.
8. Do ONE of the following:
  - (a) Maintain one or more reptiles or amphibians for at least a month. Record food accepted, eating methods, changes in coloration, shedding of skins, and general habits; or keep the eggs of a reptile from the time of laying until hatching; or keep the eggs of an amphibian from the time of laying until their transformation into tadpoles (frogs) or larvae (salamanders).
  - (b) Choose a reptile or amphibian that you can observe at a local zoo, aquarium, nature center, or other such exhibit (such as your classroom or school). Study the specimen weekly for a period of three months. At each visit, sketch the specimen in its captive habitat and note any changes in its coloration, shedding of skins, and general habits and behavior. Find out, either from information you locate on your own or by talking to the caretaker, what this species eats and what are its native habitat and home range, preferred climate, average life expectancy, and natural predators. Also identify any human-caused threats to its population and any laws that protect the species and its habitat. After the observation period, share what you have learned with your counselor.
9. Do TWO of the following:
  - (a) Identify at night three kinds of toads or frogs by their voices. Imitate the song of each for your counselor. Stalk each with a flashlight and discover how each sings and from where.
  - (b) Identify by sight eight species of reptiles or amphibians.
  - (c) Using visual aids, give a brief talk to a small group on three different reptiles and amphibians.
10. Tell five superstitions or false beliefs about reptiles and amphibians and give a correct explanation for each. Give seven examples of unusual behavior or other true facts about reptiles and amphibians.

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NOTE: Scouts must not use venomous reptiles in fulfilling requirement 8a. Species listed by federal or state law as endangered, protected, or threatened must not be used as live specimens in completing requirement 8a unless official permission has been given. In most cases, all specimens should be returned to the wild at the location of capture after the requirement has been met. Check with your merit badge counselor for those instances where the return of these specimens would not be appropriate.

Under the Endangered Species Act of 1973, some plants and animals are, or may be, protected by federal law. The same ones and/or others may be protected by state law. Be sure that you do not collect protected species.

Your state may require that you purchase and carry a license to collect certain species. Check with the wildlife and fish and game officials in your state regarding species regulations before you begin to collect.



## Rifle Shooting

1. Do the following:
  - (a) Explain why BB and pellet air guns must always be treated with the same respect as firearms.
  - (b) Describe how you would react if a friend visiting your home asked to see your or your family's firearm(s).
  - (c) Explain the need for, and use and types of, eye and hearing protection.
  - (d) Give the main points of the laws for owning and using guns in your community and state.
  - (e) Explain how hunting is related to the wise use of renewable wildlife resources.
  - (f) Obtain a copy of the hunting laws for your state. Explain the main points of hunting laws in your state and give any special laws on the use of guns and ammunition.
  - (g) Identify and explain how you can join or be a part of shooting sports activities.
  - (h) Explain to your counselor the proper hygienic guidelines used in shooting.
  - (i) Give your counselor a list of sources that you could contact for information on firearms and their uses.
2. Do ONE of the following options:

### **Rifle Shooting (Modern Cartridge Type) Option**

- (a) Identify the three main parts of a rifle, and tell how they function.
- (b) Identify and demonstrate the three fundamental rules for safe gun handling.
- (c) Identify the two types of cartridges, their parts, and how they function.
- (d) Explain to your counselor what a misfire, hangfire, and squib fire are, and explain the procedures to follow in response to each.
- (e) Identify and demonstrate the five fundamentals of shooting a rifle safely.
- (f) Identify and explain each rule for safe shooting.
- (g) Demonstrate the knowledge, skills, and attitude necessary to safely shoot a rifle from the benchrest position or supported prone position while using the five fundamentals of rifle shooting.
- (h) Identify the basic safety rules for cleaning a rifle, and identify the materials needed.
- (i) Demonstrate how to clean a rifle properly and safely.
- (j) Discuss what points you would consider in selecting a rifle.
- (k) Using a .22 caliber rimfire rifle and shooting from a benchrest or supported prone position at 50 feet, fire five groups (three shots per group) that can be covered by a quarter. Using these targets, explain how to adjust sights to zero a rifle.

(l) Adjust sights to center the group on the target\* and fire five groups (five shots per group). According to the target used, each shot in the group must meet the following minimum score: (1) A-32 targets—9; (2) A-17 or TQ-1 targets—7; (3) A-36 targets—5.

### **Air Rifle Shooting (BB or Pellet) Option**

- (a) Identify the three main parts of an air rifle, and tell how they function.
- (b) Identify and demonstrate the three fundamental rules for safe gun handling.
- (c) Identify the two most common types of air rifle ammunition.
- (d) Identify and demonstrate the five fundamentals of shooting a rifle safely.
- (e) Identify and explain each rule for shooting an air rifle safely.
- (f) Demonstrate the knowledge, skills, and attitude necessary to safely shoot a target from the benchrest position or supported prone position while using the five fundamentals of rifle shooting.
- (g) Identify the basic safety rules for cleaning an air rifle, and identify the materials needed.
- (h) Demonstrate how to clean an air rifle safely.
- (i) Discuss what points you would consider in selecting an air rifle.
- (j) Using a BB gun or pellet air rifle and shooting from a benchrest or supported prone position at 15 feet for BB guns or 33 feet for air rifles, fire five groups (three shots per group) that can be covered by a quarter.
- (k) Adjust sights to center the group on the target and fire five groups (five shots per group). According to the target used, each shot in the group must meet the following minimum score: (1) BB rifle at 15 feet or 5 meters using TQ-5 targets—8; (2) pellet air rifle at 25 feet using TQ-5 targets—8, at 33 feet or 10 meters using AR-1 targets—6.

### **Muzzleloading Rifle Shooting Option**

- (a) Give a brief history of the development of muzzleloading rifles.
- (b) Identify principal parts of percussion and flintlock rifles and discuss how they function.
- (c) Demonstrate and discuss the safe handling of muzzleloading rifles.
- (d) Identify the various grades of black powder and their proper use.
- (e) Discuss proper safety procedures pertaining to black powder use and storage.
- (f) Discuss proper components of a load.
- (g) Identify proper procedures and accessories used for loading a muzzle-loading rifle.
- (h) Demonstrate the knowledge, skills, and attitude necessary to safely shoot a muzzleloading rifle on a range, including range procedures.
- (i) Shoot a target with a muzzleloading rifle using the five fundamentals of firing a shot.

\*NOTE: It is not always practical to adjust the sights (i.e., when using a borrowed fixed-sight rifle). For requirement 2(l), you may demonstrate your ability to use the shooting fundamentals by shooting five shot groups (five shots per group) in which all shots can be covered by or touch a quarter and then explain how to adjust the sights to zero the rifle used.

- (j) Identify the materials needed to clean a muzzleloading rifle safely. Using these materials, demonstrate how to clean a muzzleloading rifle safely.
- (k) Identify the causes of a muzzleloading rifle's failure to fire and explain or demonstrate proper correction procedures.
- (l) Discuss what points you would consider in selecting a muzzleloading rifle.
- (m) Using a muzzleloading rifle of .45 or .50 caliber and shooting from a benchrest or supported prone position, fire three groups (three shots per group) at 50 feet that can be covered by the base of a standard-size soft drink can.
- (n) Center the group on the target and fire three groups (five shots per group). According to the target used, each shot in the group must meet the following minimum score: (1) at 25 yards using NRA A-23 or NMLRA 50-yard targets—7; (2) at 50 yards using NRA A-25 or NMLRA 100-yard targets—7.
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## Rowing

1. Show that you know first aid for injuries or illnesses that could occur while rowing, including cold and heat reactions, dehydration, contusions, lacerations, and blisters.
2. Do the following:
  - (a) Identify the conditions that must exist before performing CPR on a person. Explain how such conditions are recognized.
  - (b) Demonstrate proper technique for performing CPR using a training device approved by your counselor.
3. Before doing the following requirements, successfully complete the BSA swimmer test. Jump feetfirst into water over your head in depth. Level off and swim 75 yards in a strong manner using one or more of the following strokes: sidestroke, breaststroke, trudgen, or crawl; then swim 25 yards using an easy, resting backstroke. The 100 yards must be completed in one swim without stops and must include at least one sharp turn. After completing the swim, rest by floating.
4. Review and discuss Safety Afloat and demonstrate the proper fit and use of personal flotation devices (PFDs).
5. Do ONE of the following:
  - (a) Alone or with a passenger, do the following correctly in either a fixed-seat or sliding-seat rowboat:
    - (1) Launch.
    - (2) Row in a straight line for a quarter mile. Stop, make a pivot turn, and return to the starting point.



- (3) Backwater in a straight line for 50 yards. Make a turn under way and return to the starting point.
  - (4) Land and moor or rack your craft.
  - (5) Tie the following mooring knots—clove hitch, roundturn with two half-hitches, bowline, Wellman's knot, and mooring hitch.
- (b) Participate as a rowing team member in a competitive rowing meet. The team may be sponsored by a school, club, or Scout unit. The meet must include competition between two or more teams with different sponsors. Complete at least 10 hours of team practice prior to the meet.
6. Do ONE of the following:
    - (a) In a fixed-seat rowboat, come alongside a dock and help a passenger into the boat. Pull away from the dock, change positions with your passenger, and scull in good form over the stern for 10 yards, including at least one 180-degree turn. Resume your rowing position, return alongside the pier, and help your passenger out of the boat.
    - (b) In a sliding-seat rowboat, come alongside a pier and, with your buddy assisting you, get out onto the pier. Help your buddy into the boat. Reverse roles with your buddy and repeat the procedure.
  7. Participate in a swamped boat drill including righting and stabilizing the craft, reboarding in deep water, and making headway. Tell why you should stay with a swamped boat.
  8. Alone in a rowboat, push off from the shore or a dock. Row 10 yards to a swimmer. While giving instructions to the swimmer, turn the boat so that the swimmer can hold on to the stern. Tow him to shore.
  9. Show or explain the proper use of anchors for rowboats.
  10. Describe the following:
    - (a) Types of crafts used in commercial, competitive, and recreational rowing.
    - (b) Four common boatbuilding materials. Give some positive and negative points of each.
    - (c) Types of oarlocks used in competitive and recreational rowing.
  11. Discuss the following:
    - (a) The advantage of feathering oars while rowing
    - (b) Precautions regarding strong winds and heavy waves, and boat-handling procedures in rough water and windstorms
    - (c) How to properly fit out and maintain a boat in season, and how to prepare and store a boat for winter
    - (d) How to calculate the weight a boat can carry under normal conditions
    - (e) The differences between fixed-seat and sliding-seat rowing
    - (f) The different meanings of the term *sculling* in fixed- and sliding-seat rowing
    - (g) The health benefits from rowing for exercise



# S



## Safety

1. Explain what safety is and what it means to be safe. Then prepare a notebook to include:
  - (a) Newspaper and other stories, facts, and statistics showing common types and causes of injuries in the home and in the workplace, and how these injuries could be prevented
  - (b) Newspaper and other stories, facts, and statistics showing common types of crimes and ways to avoid being a crime victim
  - (c) Facts you have obtained concerning the frequency of accidents and of crimes in your local area
  - (d) A paragraph or more, written by you, explaining how a serious fire, accident, or crime could change your family life
  - (e) A list of safe practices and safety devices currently used by your family, such as safety practices used while driving or working and safety devices that prevent injuries or help in an emergency
2. Do the following:
  - (a) Using a safety checklist approved by your counselor, make an inspection of your home. Explain the hazards found and how they can be corrected.
  - (b) Review or develop your family's plan of escape in case of fire in your home. As you develop the escape plan with family members, share with them facts about the common causes of fire in the home, such as smoking, cooking, electrical appliances, and candles.
3. Do the following:
  - (a) Discuss with your counselor how you contribute to the safety of yourself, your family, and your community.
  - (b) Show your family members how to protect themselves and your home from accidents, fire, burglary, robbery, and assault.
  - (c) Discuss with your counselor the tips for online safety. Explain the steps individuals can take to help prevent identity theft.
  - (d) Discuss with your counselor the three R's of Youth Protection and how to recognize child abuse.

4. Show your family the exits you would use from different public buildings (such as a theater, municipal building, library, supermarket, shopping center, or your place of worship) in the event of an emergency. Teach your family what to do in the event that they need to take shelter in or evacuate a public place.
  5. Make an accident prevention plan for five family activities outside the home (at your place of worship, at a theater, on a picnic, at the beach, and while traveling, for example). Each plan should include an analysis of possible hazards, proposed action to correct hazards, and reasons for the correction you propose in each plan.
  6. Plan and complete a safety project approved by your counselor for your home, school, place of worship, place of employment, or community. Include in your plan an explanation of the U.S. Department of Homeland Security's Advisory System and appropriate actions to take for each threat level.
  7. Learn about three career opportunities in the field of safety. Pick one career and find out the education, training, and experience required for this profession. Discuss this choice with your counselor, and explain why this profession might interest you.
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## **Salesmanship**

1. Explain the responsibilities of a salesperson and how a salesperson serves customers and helps stimulate the economy.
2. Explain why it is important for a salesperson to do the following:
  - (a) Research the market to be sure the product or service meets the needs of customers.
  - (b) Learn all about the product or service to be sold.
  - (c) If possible, visit the location where the product is built and learn how it is constructed. If a service is being sold, learn about the benefits of the service to the customer.
  - (d) Follow up with customers after their purchase to confirm their satisfaction and discuss their concerns about the product or service.
3. Write and present a sales plan for a product or service and a sales territory assigned by your counselor.
4. Make a sales presentation of a product or service assigned by your counselor.
5. Do ONE of the following and keep a record (cost sheet). Use the sales techniques you have learned, and share your experience with your counselor:
  - (a) Help your unit raise funds through sales of merchandise or of tickets to a Scout show.
  - (b) Sell your services such as lawn raking or mowing, pet watching, dog walking, snow shoveling, and car washing to your neighbors. Follow up after the service has been completed and determine the customer's satisfaction.
  - (c) Earn money through retail selling.

6. Do ONE of the following:
- (a) Interview a salesperson and learn the following:
    - (1) What made the person choose sales as a profession?
    - (2) What are the most important things to remember when talking to customers?
    - (3) How is the product or service sold?
    - (4) Include your own questions.
  - (b) Interview a retail store owner and learn the following:
    - (1) How often is the owner approached by a sales representative?
    - (2) What good traits should a sales representative have? What habits should the sales representative avoid?
    - (3) What does the owner consider when deciding whether to establish an account with a sales representative?
    - (4) Include your own questions.
7. Investigate and report on career opportunities in sales, then do the following:
- (a) Prepare a written statement of your qualifications and experience. Include relevant classes you have taken in school and merit badges you have earned.
  - (b) Discuss with your counselor what education, experience, or training you should obtain so you are prepared to serve in that position.
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## Scholarship

1. Do ONE of the following:
- (a) Show that you have had an average grade of B or higher (80 percent or higher) for one term or semester.
  - (b) Show that for one term or semester you have improved your school grades over the previous period.
2. Do TWO of the following:
- (a) Make a list of educational places located where you live (other than schools). Visit one, and report on how you used the place for self-education.
  - (b) With your counselor's and your parent's approval, interview two professionals (other than teachers or other professionals at your school) with established careers. Find out where they were educated, what training they received, and how their education and training have helped prepare them for the career they have chosen. Find out how they continue to educate themselves. Discuss what you find out with your counselor.
  - (c) Using a daily planner, show your counselor how you keep track of assignments and activities, and discuss how you manage your time.

- (d) Discuss the advantages and disadvantages of the different methods of research available to you for school assignments, such as the library, books and periodicals, and the Internet.
3. Get a note from the principal\* of your school (or another school official named by the principal) that states that during the past year your behavior, leadership, and service have been satisfactory.
  4. Do ONE of the following:
    - (a) Show that you have taken part in an extracurricular school activity, and discuss with your counselor the benefits of participation and what you learned about the importance of teamwork.
    - (b) Discuss your participation in a school project during the past semester where you were a part of a team. Tell about the positive contributions you made to the team and the project.
  5. Do ONE of the following:
    - (a) Write a report of 250 to 300 words about how the education you receive in school will be of value to you in the future and how you will continue to educate yourself in the future.
    - (b) Write a report of 250 to 300 words about two careers that interest you and how specific classes and good scholarship in general will help you achieve your career goals.

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\*If you are home-schooled or your school environment does not include a principal, you may obtain a note from a counterpart such as your parent.



## Scouting Heritage

1. Discuss with your counselor the life and times of Lord Baden-Powell of Gilwell. Explain why he felt a program like Scouting would be good for the young men of his day. Include in your discussion how Scouting was introduced in the United States, and the origins of Boy Scouting and Cub Scouting under Baden-Powell.
2. Do the following:
  - (a) Give a short biographical sketch of any TWO of the following, and tell of their roles in how Scouting developed and grew in the United States prior to 1940.
    - (1) Daniel Carter Beard
    - (2) William D. Boyce
    - (3) Waite Phillips
    - (4) Ernest Thompson Seton
    - (5) James E. West

- (b) Discuss the significance to Scouting of any TWO of the following:
- (1) Brownsea Island
  - (2) The First World Scout Jamboree
  - (3) *Boy Scout Handbook*
  - (4) *Boys' Life* magazine
3. Discuss with your counselor how Scouting's programs have developed over time and been adapted to fit different age groups and interests (Cub Scouting, Boy Scouting, Exploring, Venturing).
4. Do ONE of the following:
- (a) Attend either a BSA national jamboree, OR world Scout jamboree, OR a national BSA high-adventure base. While there, keep a journal documenting your day-to-day experiences. Upon your return, report to your counselor what you did, saw, and learned. You may include photos, brochures, and other documents in your report.
  - (b) Write or visit the National Scouting Museum in Irving, Texas.\* Obtain information about this facility. Give a short report on what you think the role of this museum is in the Scouting program.
5. Learn about the history of your unit or Scouting in your area. Interview at least two people (one from the past and one from the present) associated with your troop. These individuals could be adult unit leaders, Scouts, troop committee members, or representatives of your troop's chartered organization. Find out when your unit was originally chartered. Create a report of your findings on the history of your troop, and present it to your patrol or troop or at a court of honor, and then add it to the troop's library. This presentation could be in the form of an oral/written report, an exhibit, a scrapbook, or a computer presentation such as a slide show.
6. Make a collection of some of your personal patches and other Scouting memorabilia. With their permission, you may include items borrowed from family members or friends who have been in Scouting in the past, or you may include photographs of these items. Show this collection to your counselor, and share what you have learned about items in the collection. (There is no requirement regarding how large or small this collection must be.)
7. Reproduce the equipment for an old-time Scouting game such as those played at Brownsea Island. You may find one on your own (with your counselor's approval), or pick one from the *Scouting Heritage* merit badge pamphlet. Teach and play the game with other Scouts.

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\*If you visited the BSA's national traveling tour, Adventure Base 100, in 2010, you may use that experience to fulfill requirement 4b.

- Interview at least three people (different from those you interviewed for requirement 5) over the age of 50 who were Scouts. Find out about their Scouting experiences. Ask about the impact that Scouting has had on their lives. Share what you learned with your counselor.
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## Scuba Diving

- Do the following:
    - Show that you know first aid for injuries or illnesses that could occur while scuba diving, including hypothermia, hyperventilation, squeezes, decompression illness, nitrogen narcosis, motion sickness, fatigue, overexertion, heat reactions, dehydration, injuries by aquatic life, and cuts and scrapes.
    - Identify the conditions that must exist before performing CPR on a person, and explain how to recognize such conditions. Demonstrate the proper technique for performing CPR using a training device approved by your counselor.
  - Before completing requirements 3 through 6, earn the Swimming merit badge.
  - Discuss the Scuba Diver's Code with your merit badge counselor, and explain the importance of each guideline to a scuba diver's safety.
  - Earn an Open Water Diver Certification from a scuba organization recognized by the Boy Scouts of America scuba policy.
  - Explain what an ecosystem is, and describe four aquatic ecosystems a diver might experience.
  - Find out about three career opportunities in the scuba industry. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.
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## Sculpture

- Explain to your counselor the precautions that must be followed for the safe use and operation of a sculptor's tools, equipment, and other materials.
- Do TWO of the following:
  - Model in clay a life-size human head. Then sculpt in modeling clay (such as Plasteline or Sculpey) or carve/rasp in wood or soft stone a small-scale model of an animal or person. Explain to your counselor the method and tools you used to sculpt the figure.

(b) Make a plaster mold of a fruit or vegetable. In this mold, make a copy of the fruit or vegetable. Explain to your counselor the method and tools you used to make the copy.

(c) With your parent's permission and your counselor's approval, visit a museum, art exhibit, art gallery, artists' co-op, or artist's studio. After your visit, share with your counselor what you have learned. Discuss the importance of visual arts and how it strengthens social tolerance and helps stimulate cultural, intellectual, and personal development.

3. Find out about career opportunities in sculpture. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.
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## Shotgun Shooting

1. Do the following:
- (a) Explain why BB and pellet air guns must always be treated with the same respect as firearms.
  - (b) Describe how you would react if a friend visiting your home asked to see your or your family's firearm(s).
  - (c) Explain the need for and use and types of eye and hearing protection.
  - (d) Explain the main points of the laws for owning and using guns in your community and state.
  - (e) Explain how hunting is related to the wise use of renewable wildlife resources.
  - (f) Successfully complete a state hunter education course, or obtain a copy of the hunting laws for your state, then do the following.
    - (1) Explain the main points of hunting laws in your state and give any special laws on the use of guns and ammunition, and
    - (2) List the kinds of wildlife that can be legally hunted in your state.
  - (g) Explain to your counselor the proper hygienic guidelines used in shooting.
  - (h) Identify and explain three shotgun sports. Identify places in your community where you could shoot these sports and explain how you can join or be a part of shooting sports activities.
  - (i) Give your counselor a list of sources that you could contact for information on firearms and their use.
2. Do ONE of the following options:

### **Shotgun Shooting (Modern Shotshell Type) Option**

- (a) Identify the principal parts of a shotgun, action types, and how they function.
- (b) Identify and demonstrate the rules for safely handling a shotgun.



- (c) Identify the parts of a shotgun shell and their functions.
- (d) Identify the various gauges of shotguns. Explain which one you would pick for use and why.
- (e) Identify and explain the fundamentals of safely shooting a shotgun.
- (f) Identify and explain each rule for safely shooting a shotgun.
- (g) Demonstrate the knowledge, skills, and attitude necessary to safely shoot moving targets, using the fundamentals of shotgun shooting.
- (h) Identify the materials needed to clean a shotgun.
- (i) Demonstrate how to clean a shotgun safely.
- (j) Discuss what points you would consider in selecting a shotgun.
- (k) Shooting score required—Hit at least 12 (48 percent) out of 25 targets in two 25-target groups. The two groups need not be shot in consecutive order.

Shooting skill rules:

- Targets may be thrown by a hand trap, manual mechanical, or on any trap or skeet field. Note: If using a hand trap or manual mechanical trap, the trap operator should be at least five feet to the right and three feet to the rear of the shooter. If throwing left-handed with a hand trap this should be reversed.
- All targets should be thrown at a reasonable speed and in the same direction.
- Targets should be generally thrown so as to climb in the air after leaving the trap.
- Scores may be fired at any time, either in formal competition or in practice.
- Any gauge shotgun not exceeding 12 gauge may be used.
- Standard clay targets customarily used for trap and skeet are to be used.
- Any ammunition, either factory or hand loaded, may be used.
- Shooters must shoot in rounds of 25. Rounds need not be shot continuously or on the same day (the term “round” refers to a single series of 25 shots).

### **Muzzle-Loading Shotgun Shooting Option**

- (a) Discuss a brief history of the development of the muzzle-loading shotgun.
- (b) Identify principal parts of percussion and flintlock shotguns and discuss how they function.
- (c) Demonstrate and discuss safe handling rules of a muzzle-loading shotgun.
- (d) Identify the various grades of black powder and their proper use.
- (e) Discuss proper safety procedures pertaining to black powder use and storage.
- (f) Discuss proper components of a load.
- (g) Identify proper procedures and accessories used for loading a muzzle-loading shotgun.
- (h) Demonstrate knowledge, skill, and attitude necessary to safely shoot a muzzle-loading shotgun on a range, including range procedures.
- (i) Shoot a moving target with a muzzle-loading shotgun using the five fundamentals of firing the shot.

- (j) Identify the materials needed to clean a muzzle-loading shotgun properly and safely.
- (k) Demonstrate how to clean a muzzle-loading shotgun safely.
- (l) Identify the causes of a muzzle-loading shotgun's failing to fire and explain or demonstrate proper correction procedures.
- (m) Discuss what points you would consider if selecting a muzzle-loading shotgun.
- (n) Shooting score required—Hit at least five out of 15 targets.

Shooting skill rules:

- Targets may be thrown by a hand trap, manual mechanical, or on any trap or skeet field. Note: If using a hand trap or manual mechanical trap, the trap operator should be at least five feet to the right and three feet to the rear of the shooter. If throwing left-handed with a hand trap this should be reversed.
- All targets should be thrown at a reasonable speed and in the same direction.
- Targets should be generally thrown so as to climb in the air after leaving the trap.
- Scores may be fired at any time, either in formal competition or in practice.
- Any gauge shotgun not exceeding 10 gauge may be used.
- Standard clay targets customarily used for trap and skeet are to be used.



## Skating

1. Show that you know first aid for injuries or illnesses that may occur while skating, including hypothermia, frostbite, lacerations, abrasions, fractures, sprains and strains, blisters, heat reactions, shock, and cardiac arrest.
2. Complete ALL of the requirements for ONE of the following options.

### Ice Skating Option

- (a) Do the following:
  - (1) Give general safety and courtesy rules for ice skating. Discuss preparations that must be taken when skating outdoors on natural ice. Explain how to make an ice rescue.
  - (2) Discuss the parts and functions of the different types of ice skates.
  - (3) Describe the proper way to carry ice skates.
  - (4) Describe how to store ice skates for long periods of time, such as seasonal storage.
- (b) Do the following:
  - (1) Skate forward at least 40 feet and come to a complete stop. Use either a two-footed snowplow stop or a one-footed snowplow stop.
  - (2) After skating forward, glide forward on two feet, then on one foot, first right and then left.

- (3) Starting from a T position, stroke forward around the test area, avoiding the use of toe points if wearing figure skates.
- (c) Do the following:
- (1) Glide backward on two feet for at least two times the skater's height.
  - (2) Skate backward for at least 20 feet on two skates.
  - (3) After gaining forward speed, glide forward on two feet, making a turn of 180 degrees around a cone, first to the right and then to the left.
- (d) Do the following:
- (1) Perform a forward shoot-the-duck until you are nearly stopped. Rise while still on one foot.
  - (2) Perform forward crossovers in a figure-eight pattern.
  - (3) Take part in a relay race.
  - (4) Perform a hockey stop.

### **Roller Skating Option**

- (a) Do the following:
- (1) Give general safety and etiquette rules for roller skating.
  - (2) Discuss the parts and functions of the roller skate.
  - (3) Describe five essential steps to good skate care.
- (b) Do the following:
- (1) Skate forward with smooth, linked strokes on two feet for at least 100 feet in both directions around the rink and demonstrate proper techniques for stopping.
  - (2) Skate forward and glide at least 15 feet on one skate, then on the other skate.
- (c) Do the following:
- (1) Perform the crosscut.
  - (2) Skate backward for at least 40 feet on two skates, then for at least 15 feet on one skate.
  - (3) Skate forward in a slalom pattern for at least 40 feet on two skates, then for at least 20 feet on one skate.
  - (4) Skate backward in a slalom pattern for at least 15 feet on two skates.
- (d) Do the following:
- (1) Shuttle skate once around the rink, bending twice along the way without stopping.
  - (2) Perform a widespread eagle.
  - (3) Perform a mohawk.
  - (4) Perform a series of two consecutive spins on skates, OR hop, skip, and jump on skates for at least 10 feet.

- (e) Do the following:
- (1) Race on a speed track, demonstrating proper technique in starting, cornering, passing, and pacing.
  - (2) Perform the limbo under a pole placed at least chest-high, OR shoot-the-duck under a waist-high pole and rise while still on one foot.
  - (3) Perform the stepover.
  - (4) While skating, dribble a basketball the length of the floor, then return to your starting position, OR push a hockey ball with a stick around the entire rink in both directions.

### **In-Line Skating Option**

- (a) Do the following:
- (1) Give general and in-line skating safety rules and etiquette.
  - (2) Describe the parts and functions of the in-line skate.
  - (3) Describe the required and recommended safety equipment.
  - (4) Describe four essential steps to good skate care.
- (b) Do the following:
- (1) Skate forward with smooth, linked strokes on two feet for at least 100 feet.
  - (2) Skate forward and glide at least 15 feet on one skate, then on the other skate.
  - (3) Stop on command on flat pavement using the heel brake.
- (c) Do the following:
- (1) Perform the forward crossover.
  - (2) Perform a series of forward, linked swizzles for at least 40 feet.
  - (3) Skate backward for at least 40 feet in a series of linked, backward swizzles.
  - (4) From a strong pace, perform a lunge turn around an object predetermined by your counselor.
  - (5) Perform a mohawk.
- (d) Do the following:
- (1) Perform a series of at least four one-footed downhill slaloms on pavement with a gentle slope.
  - (2) Describe how to pass a pedestrian or another skater from behind.
  - (3) Describe at least three ways to avoid an unforeseen obstacle while skating.
  - (4) Describe two ways to get on and off a curb, and demonstrate at least one of these methods.



## Small-Boat Sailing

1. Do the following:
  - (a) Explain first aid for injuries or illnesses that could occur while small-boat sailing, including hypothermia, dehydration, heat reactions, motion sickness, cuts, scratches, abrasions, contusions, puncture wounds, and blisters.
  - (b) Identify the conditions that must exist before performing CPR on a person, and explain how to recognize such conditions. Demonstrate proper technique for performing CPR using a training device approved by your counselor.
2. Before doing the following requirements, successfully complete the BSA swimmer test.
3. Describe the boat you will be using for the sailing requirement, naming all of the major parts and the function of those parts.\*
4. Before going afloat, do the following:
  - (a) Discuss the nine points of the BSA Safety Afloat plan.
  - (b) Explain the rules of the road in general and any specific rules or laws that apply to your area or state.
  - (c) Explain how water conditions, the hazards of weather, and heavy winds can affect both safety and performance in sailing.
  - (d) Discuss the warning signs of inclement weather and what to do should heavy winds develop or a storm approach.
  - (e) Prepare a typical float plan.
  - (f) Discuss the proper clothing, footwear, and personal gear required for small-boat sailing in warm weather and in cool weather. Explain how choosing the proper clothing, footwear, and personal gear will help keep you comfortable and safe while sailing.
5. Discuss with your counselor how to identify the wind direction and wind indicators. Explain the importance of this task before setting sail.
6. Following the BSA Safety Afloat plan, show that you and a buddy can sail a boat properly. Do the following:
  - (a) Prepare a boat for sailing, including a safety inspection.
  - (b) Get under way from a dock, mooring, or beach.
  - (c) Properly set sails for a round-trip course approved by your counselor that will include running, beating, and reaching—the basic points of sail. While sailing, demonstrate good helmsmanship skills.

\*The skills may be demonstrated on any boat available to the Scout; sailboards are not acceptable. While no specific sail plan is recommended, it is suggested that the craft be smaller than 20 feet. The boat must be capsizable and have the capability of sailing to windward.

- (d) Change direction by tacking; change direction by jibing.
  - (e) Demonstrate getting out of irons.
  - (f) Demonstrate the safety position.
  - (g) Demonstrate capsize procedures and the rescue of a person overboard.<sup>†</sup>
  - (h) Demonstrate the procedure to take after running aground.
  - (i) Upon returning to the dock, mooring, or beach, properly secure all equipment, furl or stow sails, and prepare the craft for unattended docking or beaching overnight or longer.
7. Demonstrate a working knowledge of marlinespike seamanship.  
Do the following:
- (a) Show how to tie a square (reef) knot, clove hitch, two half hitches, bowline, cleat hitch, and figure-eight knot. Demonstrate the use of each.
  - (b) Show how to heave a line, coil a line, and fake down a line.
  - (c) Discuss the kinds of lines used on sailboats and the types of fibers used in their manufacture. Explain the advantages and disadvantages of each.
8. Describe how you would care for and maintain a sailboat and its gear throughout the year.
9. With your counselor, review sailing terminology and the points of sail. Discuss various types of sailboats in use today and explain their differences.

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<sup>†</sup>Capsize procedures should be conducted under the close supervision of the counselor. A rescue boat should be standing by to assist, if necessary, and to tow the capsized craft to shore. Self-bailing boats are acceptable for this requirement. Extreme care should be taken to avoid personal injury and damage to the boat or equipment.



## Snow Sports

1. Discuss winter sports safety, and show that you know first aid for injuries or illnesses that could occur while skiing or riding, including hypothermia, frostbite, shock, dehydration, sunburn, fractures, bruises, sprains, and strains. Tell how to apply splints.
2. Explain why every skier or snowboarder should be prepared to render first aid in the event of an accident.
3. Explain the procedure used to report an accident to the local ski patrol for the area where you usually ski or ride.
4. Do EACH of the following:
  - (a) Tell the meaning of the Your Responsibility Code for skiers and snowboarders. Explain why each rider must follow this code.
  - (b) Explain the Smart Style safety program. Tell why it is important and how it applies to skiers and snowboarders in terrain parks and pipes.

- (c) Explain the precautions pertaining to avalanche safety, including the responsibility of individuals regarding avalanche safety.
  - (d) Tell the meaning of the Wilderness Use Policy. Explain why each skier and snowboarder must adopt this policy.
5. Complete ALL of the requirements for ONE of the following options: downhill (Alpine) skiing OR cross-country (Nordic) OR snowboarding.

### **Downhill (Alpine) Skiing Option**

- (a) Show how to use and maintain your own release bindings and explain the use of two others. Explain the international DIN standard and what it means to skiers.
- (b) Explain the American Teaching System and a basic snow-skiing progression.
- (c) Name the major ski organizations in the United States and explain their functions.
- (d) Discuss the five types of Alpine skis. Demonstrate two ways to carry skis and poles safely and easily.
- (e) Explain the importance of strength, endurance, and flexibility in downhill skiing. Demonstrate exercises and activities you can do to get fit for skiing.
- (f) Present yourself properly clothed and equipped for downhill skiing. Discuss how the clothing you have chosen will keep you warm and protected.
- (g) Demonstrate how to ride one kind of lift and explain how to ride two others.
- (h) Explain the international trail-marking system.
- (i) On a gentle slope, demonstrate some of the beginning maneuvers learned in skiing. Include the straight run, gliding wedge, wedge stop, sidestep, and herringbone maneuvers.
- (j) On slightly steeper terrain, show linked wedge turns.
- (k) On a moderate slope, demonstrate five to 10 christies.
- (l) Make a controlled run down an intermediate slope and demonstrate the following:
  - (1) Short-, medium-, and long-radius parallel turns
  - (2) A sideslip and safety (hockey) stop to each side
  - (3) Traverse across a slope
- (m) Demonstrate the ability to ski in varied conditions, including changes in pitch, snow conditions, and moguls. Maintain your balance and ability to turn.

### **Cross-Country (Nordic) Skiing Option**

- (a) Show your ability to select, use, and repair, if necessary, the correct equipment for ski touring in safety and comfort.
- (b) Discuss classical and telemark skis. Demonstrate two ways to carry skis safely and easily.
- (c) Discuss the basic principles of waxing for cross-country ski touring.

- (d) Discuss the differences between cross-country skiing, ski touring, ski mountaineering, and downhill skiing.
- (e) Explain the importance of strength, endurance, and flexibility in cross-country skiing. Demonstrate exercises and activities you can do to get fit for skiing.
- (f) List items you would take on a one-day ski tour.
- (g) Present yourself properly clothed and equipped for a one-day ski tour. Discuss the correct use of your clothing and equipment, and how the clothing you have chosen will keep you warm and protected.
- (h) Demonstrate the proper use of a topographic map and compass.
- (i) Show a degree of stamina that will enable you to keep up with an average ski-touring group your age.
- (j) On a gentle, packed slope, show some basic ways to control speed and direction. Include the straight run, traverse, sideslip, step turn, wedge stop, and wedge turn maneuvers.
- (k) On a cross-country trail, demonstrate effective propulsion by showing proper weight transfer from ski to ski, pole timing, rhythm, flow, and glide.
- (l) Demonstrate your ability, on a tour, to cope with an average variety of snow conditions.
- (m) Demonstrate several methods of dealing with steep hills or difficult conditions. Include traverses and kick turns going uphill and downhill, sidesteps, pole drag, and ski-pole “glissade.”

### **Snowboarding Option**

- (a) Discuss forward-fall injuries. Tell about prevention and what action must be taken in the event of any type of injury or accident.
- (b) Do the following:
  - (1) Demonstrate your ability to select the correct equipment for snowboarding and to use it for safety and comfort.
  - (2) Present yourself properly clothed and equipped for snowboarding. Discuss how the clothing you have chosen will keep you warm and protected.
- (c) Show how to use and maintain your own bindings, and explain the use of the different binding methods. Explain the need for leashes.
- (d) Discuss the four types of snowboards. Demonstrate how to carry a snowboard easily and safely.
- (e) Demonstrate exercises and activities that will get you fit for snowboarding.
- (f) Demonstrate how to ride one kind of lift and explain how to ride two others.
- (g) Explain the international trail-marking system.
- (h) Demonstrate the basic principles of waxing a snowboard.
- (i) Do the following:
  - (1) On a gentle slope, demonstrate beginning snowboarding maneuvers. Show basic ways to control speed and direction. Include the sideslipping maneuver.



- (2) On slightly steeper terrain, show traversing.
- (j) On a moderate slope, demonstrate an ollie, a nose-end grab, and a wheelie.
- (k) Make a controlled run down an intermediate slope and demonstrate the following:
- (1) Skidded, carved, and jump turns
  - (2) Stops
  - (3) Riding fakie
- (l) Demonstrate your ability to ride in varied conditions, including changes in pitch, snow conditions, and moguls. Maintain your balance and ability to turn.
- (m) Name the major snowboarding organizations in the United States and explain their functions.
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## Soil and Water Conservation

1. Do the following:
  - (a) Tell what soil is. Tell how it is formed.
  - (b) Describe three kinds of soil. Tell how they are different.
  - (c) Name the three main plant nutrients in fertile soil. Tell how they can be put back when used up.
2. Do the following:
  - (a) Define soil erosion.
  - (b) Tell why it is important. Tell how it affects you.
  - (c) Name three kinds of soil erosion. Describe each.
  - (d) Take pictures or draw two kinds of soil erosion.
3. Do the following:
  - (a) Tell what is meant by conservation practices.
  - (b) Describe the effect of three kinds of erosion-control practices.
  - (c) Take pictures or draw three kinds of erosion-control practices.
4. Do the following:
  - (a) Explain what a watershed is.
  - (b) Outline the smallest watershed that you can find on a contour map.
  - (c) Then outline on your map, as far as possible, the next larger watershed which also has the smallest in it.
  - (d) Explain what a river basin is. Tell why all people living in a river basin should be concerned about land and water use in it.

5. Do the following:
- (a) Make a drawing to show the hydrologic cycle.
  - (b) Show by demonstration at least two of the following actions of water in relation to soil: percolation, capillary action, precipitation, evaporation, transpiration.
  - (c) Explain how removal of vegetation will affect the way water runs off a watershed.
  - (d) Tell how uses of forest, range, and farm land affect usable water supply.
  - (e) Explain how industrial use affects water supply.
6. Do the following:
- (a) Tell what is meant by “water pollution.”
  - (b) Describe common sources of water pollution and explain the effects of each.
  - (c) Tell what is meant by “primary water treatment,” “secondary waste treatment,” and “biochemical oxygen demand.”
  - (d) Make a drawing showing the principles of complete waste treatment.
7. Do TWO of the following:
- (a) Make a trip to TWO of the following places. Write a report of more than 500 words about the soil and water and energy conservation practices you saw.
    - (1) An agricultural experiment
    - (2) A managed forest or woodlot, range, or pasture
    - (3) A wildlife refuge or a fish or game management area
    - (4) A conservation-managed farm or ranch
    - (5) A managed watershed
    - (6) A waste-treatment plant
    - (7) A public drinking water treatment plant
    - (8) An industry water use installation
    - (9) A desalinization plant
  - (b) Plant 100 trees, bushes, and/or vines for a good purpose.
  - (c) Seed an area of at least  $\frac{1}{8}$  acre for some worthwhile conservation purpose, using suitable grasses or legumes alone or in a mixture.
  - (d) Study a soil survey report. Describe the things in it. On tracing paper over any of the soil maps, outline an area with three or more different kinds of soil. List each kind of soil by full name and map symbol.
  - (e) Make a list of places in your neighborhood, camps, school ground, or park that have erosion, sedimentation, or pollution problems. Describe how these could be corrected through individual or group action.
  - (f) Carry out any other soil and water conservation project approved by your merit badge counselor.



## Space Exploration

1. Tell the purpose of space exploration and include the following:
  - (a) Historical reasons
  - (b) Immediate goals in terms of specific knowledge
  - (c) Benefits related to Earth resources, technology, and new products
2. Design a collector's card, with a picture on the front and information on the back, about your favorite space pioneer. Share your card and discuss four other space pioneers with your counselor.
3. Build, launch, and recover a model rocket. \* Make a second launch to accomplish a specific objective. (Rocket must be built to meet the safety code of the National Association of Rocketry. See the "Model Rocketry" chapter of the Space Exploration merit badge pamphlet.) Identify and explain the following rocket parts.
  - (a) Body tube
  - (b) Engine mount
  - (c) Fins
  - (d) Igniter
  - (e) Launch lug
  - (f) Nose cone
  - (g) Payload
  - (h) Recovery system
  - (i) Rocket engine
4. Discuss and demonstrate each of the following:
  - (a) The law of action-reaction
  - (b) How rocket engines work
  - (c) How satellites stay in orbit
  - (d) How satellite pictures of Earth and pictures of other planets are made and transmitted
5. Do TWO of the following:
  - (a) Discuss with your counselor an unmanned space exploration mission and an early manned mission. Tell about each mission's major discoveries, its importance, and what we learned from it about the planets, moons, or regions of space explored.
  - (b) Using magazine photographs, news clippings, and electronic articles (such as from the Internet), make a scrapbook about a current planetary mission.

\*If local laws prohibit launching model rockets, do the following activity: Make a model of a NASA rocket. Explain the functions of the parts. Give the history of the rocket.

- (c) Design an unmanned mission to another planet or moon that will return samples of its surface to Earth. Name the planet or moon your spacecraft will visit. Show how your design will cope with the conditions of the planet's or moon's environment.
6. Describe the purpose, operation, and components of ONE of the following:
- (a) Space shuttle
  - (b) International Space Station
7. Design an inhabited base located on the Moon or Mars. Make drawings or a model of your base. In your design, consider and plan for the following:
- (a) Source of energy
  - (b) How it will be constructed
  - (c) Life-support system
  - (d) Purpose and function
8. Discuss with your counselor two possible careers in space exploration that interest you. Find out the qualifications, education, and preparation required and discuss the major responsibilities of those positions.
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## Sports

**Note:** The activities used to fulfill the requirements for the Sports merit badge may not be used to help fulfill requirements for other merit badges.

1. Show that you know first aid for and how to prevent injuries or illnesses that could occur while playing sports, including sprains, strains, contusions, abrasions, fractures, blisters, muscle cramps, dehydration, heat and cold reactions, injured teeth, nausea, and suspected injuries to the head, neck, and back.
2. Explain the importance of the following:
  - (a) The importance of the physical exam
  - (b) The importance of maintaining good health habits for life (such as exercising regularly), and how the use of tobacco products, alcohol, and other harmful substances can negatively affect your health and your performance in sports activities
  - (c) The importance of maintaining a healthy diet
3. Discuss the following:
  - (a) The importance of warming up and cooling down
  - (b) The importance of weight training
  - (c) What an amateur athlete is and the differences between an amateur and a professional athlete

- (d) The attributes (qualities) of a good sport, the importance of sportsmanship, and the traits of a good team leader and player who exhibits Scout spirit on and off the playing field
4. Take part for one season (or four months) as a competitive individual or as a member of an organized team in TWO of the following sports: baseball, basketball, bowling, cross-country, field hockey, football, ice hockey, lacrosse, soccer, softball, table tennis, tennis, volleyball, water polo. Your counselor may approve in advance other recognized sports, but not any sport that is restricted and not authorized by the Boy Scouts of America. Then with your chosen sports do the following:
- (a) Give the rules and etiquette for the two sports you picked.
- (b) List the equipment needed for the two sports you chose. Describe the protective equipment and appropriate clothing (if any) and explain why it is needed.
- (c) Draw diagrams of the playing areas for your two sports.
5. With guidance from your counselor, establish a personal training program suited to the activities you chose for requirement 4. Then do the following:
- (a) Organize a chart to track your training, practice, and development in these sports for one season (or four months).
- (b) Demonstrate proper technique for your two chosen sports.
- (c) At the end of the season, share your completed chart with your counselor and discuss how your participation in the sports you chose has affected you mentally and physically.
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## Stamp Collecting

1. Do the following:
- (a) Discuss how you can better understand people, places, institutions, history, and geography as a result of collecting stamps.
- (b) Briefly describe some aspects of the history, growth, and development of the United States postal system. Tell how it is different from postal systems in other countries.
2. Define topical stamp collecting. Name and describe three other types of stamp collections.
3. Show at least ONE example of each of the following:
- (a) Perforated and imperforate stamps
- (b) Mint and used stamps
- (c) Sheet, booklet, and coil stamps
- (d) Numbers on plate block, booklet, or coil, or marginal markings

- (e) Overprint and surcharge
  - (f) Metered mail
  - (g) Definitive, commemorative, semipostal, and airmail stamps
  - (h) Cancellation and postmark
  - (i) First day cover
  - (j) Postal stationery (aerogramme, stamped envelope, and postal card)
4. Do the following:
- (a) Demonstrate the use of ONE standard catalog for several different stamp issues. Explain why catalog value can vary from the corresponding purchase price.
  - (b) Explain the meaning of the term *condition* as used to describe a stamp. Show examples that illustrate the different factors that affect a stamp's value.
5. Demonstrate the use of at least THREE of the following stamp collector's tools:
- (a) Stamp tongs
  - (b) Water and tray
  - (c) Magnifiers
  - (d) Hinges and stamp mounts
  - (e) Perforation gauge
  - (f) Glassine envelopes and cover sleeves
  - (g) Watermark fluid
6. Do the following:
- (a) Show a stamp album and how to mount stamps with or without hinges. Show at least ONE page that displays several stamps.
  - (b) Discuss at least THREE ways you can help to preserve stamps, covers, and albums in first-class condition.
7. Do at least TWO of the following:
- (a) Design a stamp, cancellation, or cachet.
  - (b) Visit a post office, stamp club, or stamp show with an experienced collector. Explain what you saw and learned.
  - (c) Write a review of an interesting article from a stamp newspaper, magazine, book, or Web site (with your parent's permission).
  - (d) Research and report on a famous stamp-related personality or the history behind a particular stamp.
  - (e) Describe the steps taken to produce a stamp. Include the methods of printing, types of paper, perforation styles, and how they are gummed.
  - (f) Prepare a two- to three-page display involving stamps. Using ingenuity, as well as clippings, drawings, etc., tell a story about the stamps and how they relate to history, geography, or a favorite topic of yours.

8. Mount and show, in a purchased or homemade album, ONE of the following:
- (a) A collection of 250 or more different stamps from at least 15 countries.
  - (b) A collection of a stamp from each of 50 different countries, mounted on maps to show the location of each.
  - (c) A collection of 100 or more different stamps from either one country or a group of closely related countries.
  - (d) A collection of 75 or more different stamps on a single topic. (Some interesting topics are Scouting, birds, insects, the Olympics, sports, flowers, animals, ships, holidays, trains, famous people, space, and medicine.) Stamps may be from different countries.
  - (e) A collection of postal items discovered in your mail by monitoring it over a period of 30 days. Include at least five different types listed in requirement 3.
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## Surveying

1. Show that you know first aid for the types of injuries that could occur while surveying, including cuts, scratches, snakebite, insect stings, tick bites, heat and cold reactions, and dehydration. Explain to your counselor why a surveyor should be able to identify the poisonous plants and poisonous animals that are found in your area.
2. Find and mark the corners of a five-sided lot that has been laid out by your counselor to fit the land available. Set an instrument over each of the corners and record the angle turned between each line and the distance measured between each corner. With the assistance of the counselor, compute the error of closure from the recorded notes. The error of closure must not be more than 5 feet. From the corners, take compass readings or turn angles to trees, shrubs, and rocks, and measure to them. All measurements should be made using instruments, methods, and accuracies consistent with current technology.
3. From the field notes gathered for requirement 2, draw to scale a map of your survey. Submit a neatly drawn copy.
4. Write a metes and bounds description for the five-sided lot in requirement 2.
5. Use one of the corner markers from requirement 2 as a benchmark with an assumed elevation of 100 feet. Using a level and rod, determine the elevation of the other four corner markers.
6. Get a copy of the deed to your property, or a piece of property assigned by your counselor, from the local courthouse or title agency.
7. Tell what GPS is; discuss with your counselor the importance of GPS and how it is changing the field of surveying.

8. Discuss the importance of surveying with a licensed surveyor. Also discuss the various types of surveying and mapping, and applications of surveying technology to other fields. Discuss career opportunities in surveying and related fields. Discuss the qualifications and preparation for such a career.



## Swimming

1. Discuss the prevention of and treatment for health concerns that could occur while swimming, including hypothermia, dehydration, sunburn, heat exhaustion, heatstroke, muscle cramps, hyperventilation, spinal injury, stings and bites, and cuts and scrapes.
2. Do the following:
  - (a) Identify the conditions that must exist before performing CPR on a person. Explain how to recognize such conditions.
  - (b) Demonstrate proper technique for performing CPR using a training device approved by your counselor.
3. Before doing the following requirements, successfully complete Second Class rank requirements 8a through 8c and First Class rank requirements 9a through 9c.

*Second Class rank requirements 8a through 8c:*

- (8a) Tell what precautions must be taken for a safe swim.
- (8b) Demonstrate your ability to jump feetfirst into water over your head in depth, level off and swim 25 feet on the surface, stop, turn sharply, resume swimming, then return to your starting place.
- (8c) Demonstrate water rescue methods by reaching with your arm or leg, by reaching with a suitable object, and by throwing lines and objects. Explain why swimming rescues should not be attempted when a reaching or throwing rescue is possible, and explain why and how a rescue swimmer should avoid contact with the victim.

*First Class rank requirements 9a through 9c:*

- (9a) Tell what precautions must be taken for a safe trip afloat.
- (9b) Before doing the following requirement, successfully complete the BSA swimmer test:

Jump feetfirst into water over your head in depth, swim 75 yards in a strong manner using one or more of the following strokes: sidestroke, breaststroke, trudgen, or crawl; then swim 25 yards using an easy, resting backstroke. The 100 yards must be swum continuously and include at least one sharp turn. After completing the swim, rest by floating.
- (9c) With a helper and a practice victim, show a line rescue both as tender and as rescuer. The practice victim should be approximately 30 feet from shore in deep water.



4. Demonstrate survival skills by jumping feetfirst into deep water wearing clothes (shoes, socks, swim trunks, long pants, belt, and long-sleeved shirt). Remove shoes and socks, inflate the shirt, and show that you can float using the shirt for support. Remove and inflate the pants. Swim 50 feet using the inflated pants for support, then show how to reinflate the pants while still afloat.
5. Swim continuously for 150 yards using the following strokes in good form and in a strong manner: front crawl or trudgen for 25 yards, back crawl for 25 yards, sidestroke for 25 yards, breaststroke for 25 yards, and elementary backstroke for 50 yards.
6. Do the following:
  - (a) Float faceup in a resting position for at least one minute.
  - (b) Demonstrate survival floating for at least five minutes.
  - (c) While wearing a properly fitted personal flotation device (PFD), demonstrate the HELP and huddle positions. Explain their purposes.
  - (d) Explain why swimming or survival floating will hasten the onset of hypothermia in cold water.
7. In water over your head, but not to exceed 10 feet, do each of the following:
  - (a) Use the feetfirst method of surface diving and bring an object up from the bottom.
  - (b) Do a headfirst surface dive (pike or tuck), and bring the object up again.
  - (c) Do a headfirst surface dive to a depth of at least 5 feet and swim underwater for three strokes. Come to the surface, take a breath, and repeat the sequence twice.
8. Do ONE of the following:
  - (a) Demonstrate snorkeling and scuba diving knowledge:
    - (1) Demonstrate selection and fit of mask, snorkel, and fins; discuss safety in both pool and open-water snorkeling.
    - (2) Demonstrate proper use of mask, snorkel, and fins for underwater search and rescue.
    - (3) Describe the sport of scuba diving or snorkeling, and demonstrate your knowledge of BSA policies and procedures relating to that sport.

OR

- (b) Demonstrate the following competitive swimming skills:
  - (1) Racing dive from a pool edge or dock edge (no elevated dives from racing platforms or starting blocks)
  - (2) Racing form for 25 yards on one competitive stroke (front crawl, back crawl, breaststroke, or butterfly)
  - (3) Racing turns for the stroke that you chose in 8b(2), OR, if the camp facilities cannot accommodate the racing turn, repeat 8b(2) with an additional stroke.
  - (4) Describe the sport of competitive swimming.

9. Following the guidelines set in the BSA Safe Swim Defense, in water at least 7 feet deep, show a standing headfirst dive from a dock or pool deck. Show a long shallow dive, also from the dock or pool deck.
10. Do the following:
- (a) Explain the health benefits of regular aerobic exercise, and explain why many people today do not get enough of the beneficial kinds of exercise.
  - (b) Discuss why swimming is favored as both a fitness and a therapeutic exercise.
  - (c) Write a plan for a swimming exercise program that will promote aerobic/vascular fitness, strength and muscle tone, body flexibility, and weight control for a person of Scout age. Identify resources and facilities available in your home community that would be needed for such a program.
  - (d) Discuss with your counselor the incentives and obstacles for staying with the fitness program you identified in requirement 10c. Explain the unique benefits that could be gained from this program, and discuss how personal health awareness and self-discipline would relate to your own willingness and ability to pursue such a program.





# T



## Textile

1. Discuss with your merit badge counselor the importance of textiles. In your discussion, define the terms *fiber*, *fabric*, and *textile*. Give examples of textiles you use every day.
2. Do the following:
  - (a) Get swatches of two natural-fiber fabrics (100 percent cotton, linen, wool, or silk; no blends). Get swatches of two synthetic-fiber fabrics (nylon, polyester, acrylic, olefin, or spandex). Get a sample of one cellulosic fabric (rayon, acetate, or lyocell).
  - (b) Give the origin, major characteristics, and general content of each type of fiber obtained for 2a. Explain the difference between a cellulosic manufactured fiber and a synthetic manufactured fiber.
  - (c) Describe the main steps in making raw fiber into yarn, and yarn into fabric.
  - (d) Assume you will soon buy a new garment or other textile item. Tell your counselor what fiber or blend of fibers you want the item to be, and give reasons for your choice.
3. Do TWO of the following:
  - (a) Visit a textile plant, textile products manufacturer, or textile school or college. Report on what you saw and learned.
  - (b) Weave a belt, headband, place mat, or wall hanging. Use a simple loom that you have made yourself.
  - (c) With a magnifying glass, examine a woven fabric, a nonwoven fabric, and a knitted fabric. Sketch what you see. Explain how the three constructions are different.
  - (d) Make a piece of felt.
  - (e) Make two natural dyes and use them to dye a garment or a piece of fabric.
  - (f) Waterproof a fabric.
  - (g) Demonstrate how to identify fibers, using microscope identification or the breaking test.

4. Explain the meaning of 10 of the following terms: warp, harness, heddle, shed, aramid, spandex, sliver, yarn, spindle, distaff, loom, cellulose, sericulture, extrusion, carbon fibers, spinneret, staple, worsted, nonwoven, greige goods.
  5. List the advantages and disadvantages of natural plant fibers, natural animal fibers, cellulosic manufactured fibers, and synthetic manufactured fibers. Identify and discuss at least four ecological concerns regarding the production and care of textiles.
  6. Explain to your merit badge counselor, either verbally or in a written report, five career possibilities in the textile industry. Tell about two positions that interest you the most and the education, cost of training, and specific duties those positions require.
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## Theater

1. See or read three full-length plays or scripts. These can be from the stage, movies, television, or video. Write a review of each. Comment on the story, acting, and staging.
2. Write a one-act play that will take at least eight minutes to perform. The play must have a main character, conflict, and a climax.
3. Do THREE of the following:
  - (a) Act a major part in a full-length play; or, act a part in three one-act plays.
  - (b) Direct a play. Cast, rehearse, and stage it. The play must be at least 10 minutes long.
  - (c) Design the set for a play or a production of a circus. Make a model of it.
  - (d) Design the costumes for five characters in one play set in a time before 1900.
  - (e) Show skill in stage makeup. Make up yourself or a friend as an old man, a clown, an extraterrestrial, or a monster as directed.
  - (f) Help with the building of scenery for one full-length play or two one-act plays.
  - (g) Design the lighting for a play; or, under guidance, handle the lighting for a play.
4. Mime or pantomime any ONE of the following, chosen by your counselor.
  - (a) You have come into a large room. It is full of pictures, furniture, and other things of interest.
  - (b) As you are getting on a bus, your books fall into a puddle. By the time you pick them up, the bus has driven off.

- (c) You have failed a school test. You are talking with your teacher, who does not buy your story.
- (d) You are at camp with a new Scout. You try to help him pass a cooking test. He learns very slowly.
- (e) You are at a banquet. The meat is good. You don't like the vegetable. The dessert is ice cream.
- (f) You are a circus performer such as a juggler, high-wire artist, or lion tamer doing a routine.
5. Explain the following: proscenium arch, central or arena staging, spotlight, floodlight, flies, center stage, stage right, stage left, stage brace, stage crew, cyclorama, portal, sound board.
6. Do two short entertainment features that you could present either alone or with others for a troop meeting or campfire.
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## Traffic Safety

1. Do the following:
- (a) Describe the top 10 mistakes new drivers frequently make. Name the two items you are required by law to carry with you whenever you operate a motor vehicle.
- (b) Describe how alcohol and other drugs affect the human body and why a person should never drink and drive, or drive while under the influence of any mind-altering substances including prescription drugs, cold medications, and illicit drugs. For the state where you live, find out what is the legal blood alcohol concentration and the consequences for driving while intoxicated or driving under the influence. Find out what the open-container law is in your state.
- (c) Describe at least four factors to be considered in the design of a road or highway. Explain how roadside hazards and road conditions contribute to the occurrence and seriousness of traffic crashes.
- (d) Explain why a driver who is fatigued or distracted should not operate a motor vehicle. List five common distractions, explain how driver distractions contribute to traffic accidents, and tell how drivers can minimize distractions. Describe how volunteer drivers can plan to be alert when transporting Scouting participants.
2. Do the following:
- (a) Demonstrate how to properly wear a lap or shoulder belt. Explain why it is important for drivers and passengers to wear safety belts at all times.

- (b) List five safety features found in motor vehicles besides occupant restraint systems. Describe each safety feature, how each works, and how each contributes to safety.
3. Do the following:
- (a) Using your family car or another vehicle, demonstrate that all lights and lighting systems in the vehicle are working. Describe the function and explain why each type of light is important to safe driving.
  - (b) Using your family car or another vehicle, demonstrate how to check tire pressure and identify the correct tire pressure for the vehicle. Explain why proper tire pressure is important to safe driving.
  - (c) Demonstrate a method to check for adequate tire tread. Explain why proper tire tread is important to safe driving.
  - (d) Demonstrate with a smear-and-clear test if the windshield wiper blades will clear the windshield completely or need to be replaced. Describe instances in good and bad weather when windshield washers are important to safe driving.
4. Do the following:
- (a) In a location away from traffic hazards, measure with a tape measure—not in a car—and mark off with stakes the distance that a car will travel during the time needed for decision and reaction, and the braking distances necessary to stop a car traveling 30, 50, and 70 miles per hour on dry, level pavement. Discuss how environmental factors such as bad weather and road conditions will affect the distance.
  - (b) Demonstrate the difference in nighttime visibility between a properly lit bicycle and rider (or a pedestrian) wearing reflective material and a bicycle and rider with no lights (or a pedestrian) dressed in dark clothing, without reflective material.
  - (c) Explain how color and shape are used to help road users recognize and understand the information presented on traffic and roadway signs. Explain the purpose of different types of signs, signals, and pavement markings.
  - (d) Describe at least three examples of traffic laws that apply to drivers of motor vehicles and that bicyclists must also obey.
5. Do ONE of the following:
- (a) Interview a traffic law enforcement officer in your community to identify what three traffic safety problems the officer is most concerned about. Discuss with your merit badge counselor possible ways to solve one of those problems.
  - (b) Using the Internet (with your parent's permission), visit five Web sites that cover safe driving for teenagers. As a group, discuss what you learn with your counselor and at least three other teenagers.

- (c) Initiate and organize an activity or event to demonstrate the importance of traffic safety.
  - (d) Accompanied by an adult and a buddy, pick a safe place to observe traffic at a controlled intersection (traffic signal or stop sign) on three separate days and at three different times of the day, for 30 minutes on each visit. At this intersection, survey (1) such violations as running a red light or stop sign; or (2) seat belt usage. Count the number of violations or number of drivers not wearing a seat belt. Record in general terms if the driver was young or old, male or female. Keep track of the total number of vehicles observed so that you can determine the percentage of compliance vs. violations. Discuss your findings with your merit badge counselor.
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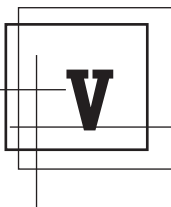
## Truck Transportation

1. List the major truck lines serving your town.
2. Do the following:
  - (a) Describe the role of truck transportation within commerce (the movement of goods, funds, and information).
  - (b) Describe how trucks fit into a company's supply chain. This could be a manufacturer, importer, wholesaler, or retailer.
  - (c) On paper, map out how goods that are manufactured overseas are transported to a retailer in this country.
3. Describe the difference between the gasoline engine and the diesel engine that power trucks. List the advantages of each.
4. Visit a truck terminal and complete items 4a through 4e. After your visit, share what you have learned with your counselor.
  - (a) Find out what kind of maintenance program the company follows to help keep its fleet, drivers, and the roadway safe.
  - (b) Find out how dispatchers maintain communication with drivers on the road.
  - (c) Talk with a professional truck driver about safety. Learn about the truck driver's rules of the road for safe driving. List five safe-driving rules every professional truck driver must follow.
  - (d) Review the driver's log and find out what kind of information the log contains.
  - (e) Learn about important federal regulations that help ensure public safety.

5. Do the following:
  - (a) Outline the general organization of a trucking company. Describe what each department does.
  - (b) List five positions with trucking companies and describe each one.
6. Name five government agencies that work closely with the trucking industry. Describe their role.
7. List five different kinds of trucks. Tell the service each provides.
8. Assume that you are going to ship by truck 500 pounds of goods (freight class 65) from your town to another town 500 miles away. Your shipment must arrive within three days. Explain in writing:
  - (a) How to prepare the shipment
  - (b) How to compare at least three carriers for time in transit and rates
  - (c) How to choose which carrier to use
  - (d) How to insure the shipment for damages
9. Define the following terms: bill of lading, ETA, logbook, intermodal, containers, tariff, shippers, carrier, consignee, drayage, cartage.
10. Learn about opportunities in the field of truck transportation. Choose one career in which you are interested and discuss with your counselor the major responsibilities of that position and the qualifications, education, and training such a position requires.







## **Veterinary Medicine**

1. Discuss with your counselor the roles a veterinarian plays in the following:
  - (a) Companion or small animal medicine, and equine medicine
  - (b) Food animal or large animal medicine
  - (c) Exotic animal medicine
  - (d) Marine animal medicine (mammal and fish)
  - (e) Poultry medicine
  - (f) Wildlife medicine and aquaculture medicine
2. Discuss with your counselor the roles a veterinarian plays in the following:
  - (a) Public health medicine and zoonotic disease surveillance and control
  - (b) The military
  - (c) Food safety and inspection
  - (d) Laboratory animal medicine and research
  - (e) Teaching and government
3. Describe the training required to become a veterinarian. Where is the veterinary medical college nearest you? Describe the prerequisites for applying to veterinary school.
4. Tell your counselor what a registered veterinary technician (R.V.T.) or animal health technician (A.H.T.) is. Describe the training required to become an R.V.T. or A.H.T. Where is the school or facility for R.V.T. or A.H.T. training nearest you? Describe the role an R.V.T. or A.H.T. would play in assisting a veterinarian working in three of the practice types listed in requirement 1.
5. Discuss with your merit badge counselor the role a veterinarian plays in the human-animal bond.

6. Do ONE of the following:

(a) Visit a veterinary clinic, hospital, or veterinary referral teaching hospital that does work in one of the practices listed in requirement 1. Spend as much time as you can observing the veterinarians and their staff. Write a report on what you observed and learned at the facility. Share your report with your counselor.

(b) Spend as much time as possible with a veterinarian who works in one of the fields listed in requirement 2. Learn what special training beyond veterinary medical school may have been required for that position. Learn about any special or unusual activities required of this position. Write a report on what you have learned about this field of veterinary medicine. Include in your report how this field serves the needs of the general public. Share your report with your counselor.

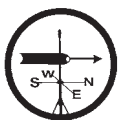


# W



## Water Sports

1. Show that you know first aid for injuries or illnesses that could occur while participating in water sports, including hypothermia, heat exhaustion, heat-stroke, dehydration, sunburn, minor cuts and bruises, and blisters.
2. Do the following:
  - (a) Identify the conditions that must exist before performing CPR on a person. Explain how such conditions are recognized.
  - (b) Demonstrate proper technique for performing CPR using a training device approved by your counselor.
3. Before doing the following requirements, successfully complete the BSA swimmer test.
4. Do the following:
  - (a) Discuss the BSA Safety Afloat policy. Tell how it applies to water sports.
  - (b) Name the different types of personal flotation devices (PFDs), and explain when each type should be used. Show how to choose and properly fit a PFD.
  - (c) Know the Water Sports Safety Code. Promise that you will live up to it and follow it in all water work for this badge. Know the safety precautions that must be used by the boat operator in pulling water-skiers and wakeboarders.
5. Show the following skier signals to the safety observer in the boat: skier safe, faster, slower, turns, back to dock, cut motor, skier in water.
6. Showing reasonable control while using two skis, one ski, or a wakeboard, do EACH of the following:
  - (a) Show how to enter the water from a boat and make a deepwater start without help.
  - (b) Show you can cross both wakes four times and return to the center of the wake each time, without falling.
  - (c) Show you can fall properly to avoid an obstacle. Also show that you can drop handle and coast to a stop without losing your balance.
7. While on shore, show that you know how to properly adjust the bindings of your ski(s) or wakeboard to fit yourself. Then, in deep water, show you can adjust bindings to fit. Recover and put on your ski(s) or wakeboard that has come off during a fall.



## Weather

1. Define meteorology. Explain what weather is and what climate is. Discuss how the weather affects farmers, sailors, aviators, and the outdoor construction industry. Tell why weather forecasts are important to each of these groups.
2. Name five dangerous weather-related conditions. Give the safety rules for each when outdoors and explain the difference between a severe weather watch and a warning. Discuss the safety rules with your family.
3. Explain the difference between high and low pressure systems in the atmosphere. Tell which is related to good and to poor weather. Draw cross sections of a cold front and a warm front, showing the location and movements of the cold and warm air, the frontal slope, the location and types of clouds associated with each type of front, and the location of precipitation.
4. Tell what causes wind, why it rains, and how lightning and hail are formed.
5. Identify and describe clouds in the low, middle, and upper levels of the atmosphere. Relate these to specific types of weather.
6. Draw a diagram of the water cycle and label its major processes. Explain the water cycle to your counselor.
7. Define acid rain. Identify which human activities pollute the atmosphere and the effects such pollution can have on people.
8. Do ONE of the following:
  - (a) Make one of the following instruments: wind vane, anemometer, rain gauge, hygrometer. Keep a daily weather log for one week using information from this instrument as well as from other sources such as local radio and television stations, NOAA Weather Radio, and Internet sources (with your parent's permission). Record the following information at the same time every day: wind direction and speed, temperature, precipitation, and types of clouds. Be sure to make a note of any morning dew or frost. In the log, also list the weather forecasts from radio or television at the same time each day and show how the weather really turned out.
  - (b) Visit a National Weather Service office or talk with a local radio or television weathercaster, private meteorologist, local agricultural extension service officer, or university meteorology instructor. Find out what type of weather is most dangerous or damaging to your community. Determine how severe weather and flood warnings reach the homes in your community.
9. Do ONE of the following:
  - (a) Give a talk of at least five minutes to a group (such as your unit or a Cub Scout pack) explaining the outdoor safety rules in the event of lightning, flash floods, and tornadoes. Before your talk, share your outline with your counselor for approval.

- (b) Read several articles about acid rain and give a prepared talk of at least five minutes to a group (such as your unit or a Cub Scout pack) about the articles. Before your talk, share your outline with your counselor for approval.
10. Find out about a weather-related career opportunity that interests you. Discuss with and explain to your counselor what training and education are required for such a position, and the responsibilities required of such a position.
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## Whitewater

- Do the following:
  - Review with your counselor the first aid for injuries or illnesses that could occur while working on the Whitewater merit badge, including hypothermia, heat reactions, dehydration, insect stings, blisters, bruises, cuts, and shoulder dislocation.
  - Identify the conditions that must exist before performing cardiopulmonary resuscitation (CPR) on a person. Explain how such conditions are recognized.
  - Demonstrate proper technique for performing CPR using a training device approved by your counselor.
- Do the following:
  - Review and compare BSA Safety Afloat and the American Whitewater safety guidelines and demonstrate your understanding of these principles by answering questions from your counselor.
  - Identify and explain the use and importance of safety equipment on moving water. Include in your explanation a discussion about throw ropes, whistles, and how to choose and properly fit PFDs (personal flotation devices) and helmets.
- Before doing requirements 4 through 13, earn the Canoeing merit badge if you will be using a canoe to earn this merit badge. If you will be using a kayak, earn the Kayaking BSA Award.
- Do ONE of the following:
  - If you are completing these requirements as a tandem canoeist, demonstrate basic canoe-handling skills by completing the Scout gate test within 160 seconds while paddling tandem with a buddy. Then demonstrate the following strokes: cross forward, cross draw, bow pry, Duffek, high brace, and low brace.
  - If you are completing these requirements as a solo canoeist, demonstrate basic solo canoe-handling skills by completing the Scout gate test within 160 seconds. Then demonstrate the following strokes: cross forward, cross draw, stern pry, Duffek, high brace, and low brace.
  - If you are using a kayak to complete these requirements, demonstrate basic kayak-handling skills by completing the Scout gate test within

160 seconds. Demonstrate the following strokes: Duffek, high brace, low brace, and sculling draw. Then do the following:

- (1) Move the kayak forward in a reasonably straight line for 10 yards.
- (2) Move the kayak sideways to the right and to the left.
- (3) Pivot 360 degrees to the right and left.
- (4) Stop the kayak.

5. Do the following:

- (a) Explain the importance of scouting before committing to running a rapid, and discuss good judgment when evaluating a stretch of river or a particular rapid.
- (b) Explain the terms *downstream V*, *riffle*, *strainer*, *eddy*, *eddy line*, *pillow*, *ledge*, *bend*, *shallows*, *falls*, *low-head dam*, *current*, *rock*, *drop*, *horizon line*, *wave*, *standing wave*, *hydraulic*, and *sleeper*.
- (c) Explain how to scout and read a river while ashore and while afloat, and discuss the importance of hazard recognition.
- (d) Demonstrate your ability to read the river where you are practicing and demonstrating your whitewater skills.

6. Explain the International Scale of River Difficulty and apply the scale to the stretch of river where you are practicing and demonstrating your whitewater skills. Identify the specific characteristics of the river that are factors in your classification according to the International Scale.

7. Explain the importance of communication during every whitewater outing. Explain and then demonstrate using the following river signals: “Run right,” “Run left,” “Run down the center,” “Stop,” “Are you OK?” and “Help!”

8. Do the following:

- (a) Explain the differences between flatwater and whitewater canoes. Identify the different materials used in modern whitewater canoe construction and the advantages and disadvantages of each.
- (b) Describe the various types of kayaks and how they differ in design, materials, and purpose.
- (c) Identify the advantages and special uses for kayaks and decked canoes in moving water.
- (d) Discuss the construction, safety, and functional features of paddles used in whitewater activities.

9. Discuss the personal and group equipment necessary for a safe whitewater outing and how and why it is used. Explain how to pack and protect these items.

10. Wearing the proper personal flotation device (PFD) and being appropriately dressed for the weather and water conditions, perform the following skills in moving water in a properly equipped whitewater craft of your choice (tandem canoe, solo canoe, or solo kayak). If a tandem canoe is used, the skills must be demonstrated from both the bow and stern positions.

- (a) Launch and land.
- (b) Paddle forward in a straight line.
- (c) Backpaddle.
- (d) Sideslip, both sides.

- (e) Ferry upstream and downstream.
  - (f) Eddy turn.
  - (g) Peel out.
11. Explain and demonstrate:
    - (a) Self-rescue and procedures when capsized in moving water, including a wet exit if necessary
    - (b) Safe rescue of others in various whitewater situations using a throw rope
    - (c) Portaging—when and how to do it
    - (d) The whitewater buddy system using at least three persons and three craft
  12. Discuss the use of inflatable rafts on moving water. In your discussion, explain the special safety precautions that should be taken when using an inflatable raft and the risks of “tubing” on moving water.
  13. Participate in a whitewater trip using either a canoe or kayak on a Class I or Class II river. Help to prepare a written plan, specifying the route, schedule, equipment, safety precautions, and emergency procedures. Determine local rules and obtain permission from landowners and land managers in advance. Explain what steps you have taken to comply with BSA Safety Afloat and the American Whitewater safety guidelines. Execute the plan with others.
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## Wilderness Survival

1. Show that you know first aid for and how to prevent injuries or illnesses that could occur in backcountry settings, including hypothermia, heat reactions, frostbite, dehydration, blisters, insect stings, tick bites, and snakebites.
2. From memory, list the seven priorities for survival in a backcountry or wilderness location. Explain the importance of each one with your counselor.
3. Discuss ways to avoid panic and maintain a high level of morale when lost, and explain why this is important.
4. Describe the steps you would take to survive in the following conditions:
  - (a) Cold and snowy
  - (b) Wet (forest)
  - (c) Hot and dry (desert)
  - (d) Windy (mountains or plains)
  - (e) Water (ocean, lake, or river)
5. Put together a personal survival kit and explain how each item in it could be useful.
6. Using three different methods (other than matches), build and light three fires.

7. Do the following:
    - (a) Show five different ways to attract attention when lost.
    - (b) Demonstrate how to use a signal mirror.
    - (c) Describe from memory five ground-to-air signals and tell what they mean.
  8. Improvise a natural shelter. For the purpose of this demonstration, use techniques that have little negative impact on the environment. Spend a night in your shelter.
  9. Explain how to protect yourself from insects, reptiles, and bears.
  10. Demonstrate three ways to treat water found in the outdoors to prepare it for drinking.
  11. Show that you know the proper clothing to wear in your area on an overnight in extremely hot weather and in extremely cold weather.
  12. Explain why it usually is not wise to eat edible wild plants or wildlife in a wilderness survival situation.
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## Wood Carving

1. Show that you know first aid for injuries or illnesses that could occur while wood carving, including minor cuts and scratches and splinters.
2. Do the following:
  - (a) Earn the Totin' Chip recognition.
  - (b) Discuss with your merit badge counselor your understanding of the Safety Checklist for Carving.
3. Do the following:
  - (a) Explain to your counselor, orally or in writing, the care and use of five types of tools that you may use in a carving project.
  - (b) Tell your counselor how to care for and use several types of sharpening devices, then demonstrate that you know how to use these devices.
4. Using a piece of scrap wood or a project on which you are working, show your merit badge counselor that you know how to do the following:
  - (a) Paring cut
  - (b) Basic cut and push cut
  - (c) Score line
  - (d) Stop cut
5. Tell why different woods are used for different projects. Explain why you chose the type of wood you did for your projects in requirements 6 and 7.
6. Plan your own or select a project from the *Wood Carving* merit badge pamphlet and complete a simple carving in the round.
7. Complete a simple low-relief OR a chip carving project.





## Woodwork

1. Do the following:
  - (a) Show that you know first aid for injuries that could occur while woodworking, including splinters, scratches, cuts, severe bleeding, and shock. Tell what precautions must be taken to help prevent loss of eyesight or hearing, and explain why and when it is necessary to use a dust mask.
  - (b) Earn the Totin' Chip recognition.
  - (c) Tell your counselor what precautions you take to safely use your tools.
2. Do the following:
  - (a) Describe how timber is grown, harvested, and milled. Tell how lumber is cured, seasoned, graded, and sized.
  - (b) Collect and label blocks of six kinds of wood useful in woodworking. Describe the chief qualities of each. Give the best uses of each.
3. Do the following:
  - (a) Show the proper care, use, and storage of all working tools and equipment that you own or use at home or school.
  - (b) Sharpen correctly the cutting edges of two different tools.
4. Using a saw, plane, hammer, brace, and bit, make something useful of wood. Cut parts from lumber that you have squared and measured from working drawings.
5. Create your own carpentry project. List the materials you will need to complete your project, and then build your project. Keep track of the time you spend and the cost of the materials.
6. Do any TWO of the following:
  - (a) Make working drawings of a project needing (1) beveled or rounded edges OR curved or incised cuttings, OR (2) miter, dowel, or mortise and tenon joints. Build this project.
  - (b) Make something for which you have to turn duplicate parts on a lathe.
  - (c) Make a cabinet, box, or something else with a door or lid fastened with inset hinges.
  - (d) Help make and repair wooden toys for underprivileged children OR help carry out a carpentry service project approved by your counselor for a charitable organization.
7. Talk with a cabinetmaker or carpenter. Find out about the training, apprenticeship, career opportunities, work conditions, work hours, pay rates, and union organization that woodworking experts have in your area.

# Special OPPORTUNITIES

*Here are the qualifications for additional opportunities for Boy Scouts and Venturers to improve their skills and to serve others. To earn special recognition in these fields you must meet these requirements:*



## 50-Miler Award

The 50-Miler Award is presented to each qualifying individual for satisfactory participation in an approved trip. In order to qualify for the award the group of which the individual is a member must fulfill all of the following requirements.

1. Make complete and satisfactory plans for the trip, including the possibilities of advancement.
2. Cover the trail or canoe or boat route of not less than 50 consecutive miles; take a minimum of five consecutive days to complete the trip without the aid of motors. (In some areas pack animals may be used.)
3. During the time on the trail or waterway, complete a minimum of 10 hours each of group work on projects to improve the trail, springs, campsite, portage, or area. If, after checking with recognized authorities, it is not possible to complete 10 hours each of group work on the trail, a similar project may be done in the unit's home area. (There should be no unauthorized cutting of brush or timber.)
4. Unit or tour leader must then file a 50-Miler Award application with the local council service center. This application gives additional details about planning the trip.



## Firem'n Chit

This certification grants a Scout the right to carry matches and build campfires. The Scout must show his Scout leader, or someone designated by his leader, that he understands his responsibility to do the following:

1. I have read and understand use and safety rules from the *Boy Scout Handbook*.
2. I will build a campfire only when necessary and when I have the necessary permits (regulations vary by locality).
3. I will minimize campfire impacts or use existing fire lays consistent with the principles of Leave No Trace. I will check to see that all flammable material is cleared at least 5 feet in all directions from fire (total 10 feet).
4. I will safely use and store fire-starting materials.
5. I will see that fire is attended to at all times.
6. I will make sure that water and/or shovel is readily available. I will promptly report any wildfire to the proper authorities.
7. I will use the cold-out test to make sure the fire is cold out and will make sure the fire lay is cleaned before I leave it.
8. I follow the Outdoor Code and the principles of Leave No Trace.

The Scout's "Firem'n Rights" can be taken from him if he fails in his responsibility.



## Historic Trails Award

To earn the award, members of your unit must plan and participate in a historic activity. A unit historic activity requires members to:

1. Locate a historic trail or site and study information relating to it. (The information may be obtained from an adult historic society, public library, or people living near the trail or site.)
2. Hike or camp two days and one night along the trail or in the vicinity of the site.
3. Cooperate with an adult group such as a historic society to restore and mark all or part of this trail or site. (This may be done during the hike or overnight camp.) Or cooperate with such a group to plan and stage a historic pageant, ceremony, or other public event related to this trail or site—such event should be large enough to merit coverage by the local press.
4. Your unit leader must then file the Historic Trails Award application with your council service center.



## National Outdoor Badges for Camping, Hiking, Aquatics, Riding, and Adventure

The five National Outdoor Badges recognize a Boy Scout or Varsity Scout who demonstrates both *knowledge* and *experience* in camping, hiking, aquatics, riding, or adventure. Scouts earning the National Outdoor badges have demonstrated that they are knowledgeable, safe, and comfortable in the outdoor activity covered by the badge.

National Outdoor badges may be earned in the following areas.

**Camping.** A Boy Scout or Varsity Scout may earn the National Outdoor Badge for Camping upon successfully completing the following requirements:

1. Earn the First Class rank.
2. Earn the Camping merit badge.
3. Earn two of the following three merit badges: Cooking, First Aid, Pioneering.
4. Complete 25 days and nights of camping—including six consecutive days (five nights) of resident camping, approved and under the auspices and standards of the Boy Scouts of America—including nights camped as part of requirements 1 through 3 above.

A gold device may be earned for each additional 25 nights of camping. A silver device is earned for each additional 100 nights of camping. The Scout may wear any combination of devices totaling his current number of nights camping.

**Hiking.** A Boy Scout or Varsity Scout may earn the National Outdoor Badge for Hiking upon successfully completing the following requirements:

1. Earn the First Class rank.
2. Earn the Hiking and Orienteering merit badges.
3. Complete 100 miles of hiking or backpacking under the auspices of the Boy Scouts of America, including miles hiked as part of requirement 2.

A gold device may be earned for each additional 50 miles hiked. A silver device is earned for each additional 200 miles of hiking. The Scout may wear any combination of devices totaling his current number of miles hiking.

**Aquatics.** A Boy Scout or Varsity Scout may earn the National Outdoor Badge for Aquatics upon successfully completing the following requirements:

1. Earn the First Class rank.
2. Earn the Swimming and Lifesaving merit badges.
3. Earn the Mile Swim BSA Award.
4. Earn at least one of the following merit badges: Canoeing, Rowing, Small-Boat Sailing, Whitewater. Complete at least 25 hours of on-the-water time, applying the skills that you learned in the merit badges.
5. Complete at least 50 hours of any combination of swimming, canoeing, rowing, small-boat sailing, or whitewater activity under the auspices of the Boy Scouts of America, including time spent in requirements 2 through 4.

A gold device may be earned for each additional 25 hours of aquatic activity. A silver device is earned for each additional 100 hours of aquatic activity. The Scout may wear any combination of devices totaling his current number of hours of aquatic activity.

**Riding.** A Boy Scout or Varsity Scout may earn the National Outdoor Badge for Riding upon successfully completing the following requirements:

1. Earn the First Class rank.
2. Complete at least one of the following:
  - a. Cycling merit badge and 100 miles of cycling; or

- b. Horsemanship merit badge and 50 miles of horseback riding.
3. Complete 200 miles of riding activities, either on a nonmotorized bike or a stock animal, under the auspices of the Boy Scouts of America, including the miles in requirement 2.

A gold device may be earned for each additional 100 miles of riding. A silver device is earned for each additional 400 miles of riding. The Scout may wear any combination of devices totaling his current number of miles of riding.

**Adventure.** A Boy Scout or Varsity Scout may earn the National Outdoor Badge for Adventure upon successfully completing the following requirements:

1. Earn the First Class rank.
2. Complete either the Wilderness Survival or the Emergency Preparedness merit badge.
3. Complete 10 of any combination or repetition of the following adventure activities under the auspices of the Boy Scouts of America:
  - a. A backpacking trip lasting three or more days and covering more than 20 miles without food resupply
  - b. A canoeing, rowing, or sailing trip lasting three or more days and covering more than 50 miles without food resupply
  - c. A whitewater trip lasting two or more days and covering more than 20 miles without food resupply
  - d. A climbing activity on open rock, following Climb On Safely principles, that includes camping overnight
  - e. Earn the National Historic Trails Award
  - f. Earn the 50-Miler Award
  - g. Attend any national high-adventure base or any nationally recognized local high-adventure or specialty adventure program.

Items 3a through 3g may be repeated as desired. A single activity that satisfies multiple items in 3a through 3g may be counted as separate activities at the discretion of the unit leader. Similarly, a single activity that doubles an item in 3a through 3d may be counted as two activities at the discretion of the unit leader. A gold device may be earned for each additional five activities. A silver device is earned for each additional 20 activities. The Scout may wear any combination of devices totaling his current number of activities.



## National Medal for Outdoor Achievement

The National Medal for Outdoor Achievement is the highest recognition that a Boy Scout or Varsity Scout can earn for exemplary achievement, experience, and skill in multiple areas of outdoor endeavor. In order for a Scout to earn the National Medal for Outdoor Achievement, the Scout must complete the following requirements:

1. Earn the First Class rank.
2. Earn the National Outdoor Badge for Camping with a silver device.
3. Earn any two additional National Outdoor Badges, each with two gold devices.
4. Earn the following merit badges: Backpacking, Emergency Preparedness, Nature, Wilderness Survival.
5. Complete a 16-hour course in Wilderness First Aid from the American Red Cross, Wilderness Medical Institute, or other recognized provider.
6. Become a Leave No Trace Trainer by completing the 16-hour training course from a recognized Leave No Trace Master Educator.
7. Plan and lead, with the approval of your unit leader, an outing for your troop, team, patrol, or squad in two of the following activity areas: hiking and backpacking, aquatic activities, or riding. Include in each outing a service element addressing recreational impacts resulting from that type of activity. With the approval of your unit leader, you may plan and lead the outings for another Cub Scout pack, Boy Scout troop, Varsity Scout team, Sea Scout ship, or Venturing crew.
8. Complete at least one of the following:
  - a. Plan and lead, with the approval of your unit leader, an adventure activity identified in the National Outdoor Badge for Adventure for your troop, team, patrol, or squad.
  - b. Successfully complete a season on a council summer camp staff in an outdoor area, such as aquatics, Scoutcraft, nature/environment, climbing, or COPE.



## William T. Hornaday Awards\*

These awards are presented for distinguished service in natural resource conservation for units, Scouts, Venturers, and Scouters. Boy Scouts may earn the Hornaday Badge or the Hornaday Bronze or Silver Medal.

### WILLIAM T. HORNADAY BADGE

To be eligible for the Hornaday Badge, presented by the local council, a Boy Scout must do the following:

1. Earn First Class rank.
2. Plan, lead, and carry out at least **one project** from one of the categories listed (see the next page).
3. Complete the requirements for any **three** of the merit badges listed in bold. In addition, complete any **two** of the others listed.

### WILLIAM T. HORNADAY BRONZE OR SILVER MEDAL

To be eligible for these awards, granted by the National Council, a Boy Scout must do the following:

1. Earn First Class rank.
2. **For the bronze medal:** Plan, lead, and carry out at least **three projects from three separate categories** listed. Earn the Environmental Science merit badge, plus at least three additional badges shown in boldface, and any two others listed.
3. **For the silver medal:** Plan, lead, and carry out at least **four projects from four separate categories** listed. Earn all six merit badges listed in boldface, plus any three others listed.

### PROJECT CATEGORIES

- Energy conservation
- Soil and water conservation
- Fish and wildlife management
- Forestry and range management
- Air and water pollution control
- Resource recovery (recycling)
- Hazardous material disposal and management
- Invasive species control

\*For complete requirements, see the William T. Hornaday Awards application, No. 430-107.



## MERIT BADGES

- Energy
- Environmental Science
- Fish and Wildlife Management
- Forestry
- Public Health
- Soil and Water Conservation
- Bird Study
- Fishing
- Fly-Fishing
- Gardening
- Geology
- Insect Study
- Landscape Architecture
- Mammal Study
- Nature
- Nuclear Science
- Oceanography
- Plant Science
- Pulp and Paper
- Reptile and Amphibian Study
- Weather



## National Court of Honor Lifesaving and Meritorious Action Awards

National awards for lifesaving and meritorious action are made only for outstanding and unusual acts that demonstrate unusual heroism, skill, or bravery and reflect Scouting ideals, based on the following criteria:

1. **Honor Medal With Crossed Palms.** Has demonstrated unusual heroism and extraordinary skill or resourcefulness in saving or attempting to save life *at extreme risk to self*.
2. **Honor Medal.** Has demonstrated unusual heroism and skill or resourcefulness in saving or attempting to save life *at considerable risk to self*.
3. **Heroism Award.** Has demonstrated heroism and skill in averting serious injury or saving or attempting to save life *at minimum risk to self*.
4. **Medal of Merit.** Has performed an act of service *of a rare or exceptional character* that reflects an uncommon degree of concern for the well-being of others.

5. **National Certificate of Merit.** Has performed a significant act of service that is deserving of special national recognition. *Note:* If the action is deserving of merit but does not qualify for a national award, the Scout may be eligible for the Local Council Certificate of Merit, No. 33732.

Heroism is defined as conduct exhibiting courage, daring, skill, and self-sacrifice.

Skill is defined as the ability to use one's knowledge effectively in execution or performance. Special attention is given to skills earned in Scouting.

## FRANÇAIS

### **Interpreter Strip (UNIFORM AND INSIGNIA WORN CENTERED ABOVE "BOY SCOUTS OF AMERICA" STRIP)**

Boys and adults may wear this strip if they show their knowledge of a foreign language or the sign language for the hearing impaired by:

1. Carrying on a five-minute conversation in this language.
2. Translating a two-minute speech or address.
3. Writing a letter in the language.\*
4. Translating 200 words from the written word.

\*Does not apply for sign language.



### **Paul Bunyan Woodsman (TRAIL PACK OR BLANKET EMBLEM)**

Study the *Boy Scout Handbook* and the *Camping* merit badge pamphlet, and demonstrate to your Scoutmaster or other qualified person the following:

1. Show that you have earned the Totin' Chip.
2. Help a Scout or patrol earn the Totin' Chip, and demonstrate to him (them) the value of proper woods-tools use on a troop camping trip.

3. With official approval and supervision, do ONE of the following:
  - (a) Clear trails or fire lanes for two hours.
  - (b) Trim a downed tree, cut into four-foot lengths, and stack; make a brush with branches.
  - (c) Build a natural retaining wall or irrigation way to aid in a planned conservation effort.



## **Boardsailing BSA**

### **REQUIREMENTS**

1. Review the BSA guidelines for boardsailing and explain steps you have taken to follow each of the 11 guidelines found in section V of *Camp Program and Property Management*, No. 20-920.
2. Explain precautions to be taken for boardsailing on each of the following:
  - (a) Lakes
  - (b) Rivers
  - (c) Ocean or bay areas
3. What is hypothermia? Describe to your counselor the symptoms of hypothermia. What special considerations in preventing hypothermia are necessary for boardsailing?
4. Properly rig and prepare the sailboard you are using. Point out and explain the function of each of the following: uphaul, out-haul, downhaul, cleat, leach, tack, clew, foot, skeg, centerboard, wishbone boom, universal, luff, and center of effort. Explain how to steer the sailboard.
5. Demonstrate your ability to uphaul the sail, find the neutral position to the wind (sail luffing), and control the board's position with foot movement.
6. With supervision from your instructor, sail a course that involves beating, reaching, and running. Change tack by coming about.



## **Leave No Trace Achievement Award**

### **SCOUT REQUIREMENTS**

1. Recite and explain in your own words the principles of Leave No Trace, and discuss how an ethical guideline differs from a rule.
2. On three separate camping trips with your troop or team, demonstrate and practice the Leave No Trace skills appropriate to the trip.
3. Earn the Camping and Environmental Science merit badges.
4. Participate in a Leave No Trace–related service project that reduces or rehabilitates recreational impacts. Discuss with your troop or team which recreational impacts were involved with the project.
5. Give a 10-minute presentation on a Leave No Trace topic approved by your unit leader to a Scouting unit or other interested group.
6. Teach a Leave No Trace–related skill to a Scouting unit or other interested group.



## **Snorkeling BSA\***

### **REQUIREMENTS**

1. Before doing other requirements, successfully complete the BSA swimmer test: Jump feetfirst into water over the head in depth, level off, and begin swimming. Swim 75 yards in a strong manner using one or more of the following strokes: sidestroke, breaststroke, trudgen, or crawl; then swim 25 yards using an easy, resting backstroke. The 100 yards must be completed in one swim without stops and must include at least one sharp turn. After completing the swim, rest by floating.
2. Discuss the importance of using the buddy system at all times while snorkeling and list duties of a buddy, beginning with equipment checks.
3. Explain the function, fit, and selection of mask, fins, and snorkel. Discuss the use of inflatable flotation vests and PFDs when snorkeling in open water.
4. In confined, shallow water (about waist deep), demonstrate use of mask and snorkel:
  - (a) Show how to prevent the mask from fogging and how to equalize pressure in mask, ears, and sinus cavities. With your head underwater, flood the mask, observe the effect on your vision, surface, and drain the water from the mask.
  - (b) With your face in the water, breathe through the snorkel. Then submerge, surface, clear water from the snorkel, and resume free breathing without removing the snorkel from your mouth.
5. In confined, shallow water, demonstrate the use of swim fins:
  - (a) Fit and adjust fins to feet.
  - (b) Walk with fins as if entering from a beach.
  - (c) Swim at the surface (10 yards) and underwater (three yards) using the flutter kick.
  - (d) Control direction without using hands while swimming with fins at the surface and underwater.

\*See Snorkeling BSA Application, No. 14-176B, for detailed requirements.

6. In confined, deep water (six to 12 feet), demonstrate:
  - (a) Proper techniques for entering and exiting the water with snorkeling equipment from a dock or boat.
  - (b) Headfirst and feetfirst surface dives, including proper body position for safe ascent and descent.
7. Show knowledge of snorkeling signals:
  - (a) Demonstrate divers' signs and signals, both audible and visual, for use at the surface and underwater.
  - (b) Set out a diver down flag and explain its function.
8. In clear, confined water eight to 12 feet deep that has a firm bottom, while swimming with a buddy, use mask, fins, and snorkel to locate and recover an object from the bottom.
9. Demonstrate basic survival skills:
  - (a) Float facedown for five minutes while breathing through a snorkel with a minimum of movement.
  - (b) Demonstrate survival floating for five minutes without use of a snorkel.
  - (c) Using fins, show how to tow an exhausted or unconscious buddy to safety.
10. Review and explain the eight points of Safe Swim Defense and BSA Snorkeling Safety. Explain training, preparations, and precautions required for snorkeling in open water. Explain environmental factors that affect snorkeling and discuss special precautions needed for oceans, streams, and lakes.
11. Explain pressure, buoyancy, and submerged optics and acoustics related to snorkel swimming and diving.
12. Discuss the effects of submersion on the body and how to handle potentially dangerous situations:
  - (a) What is hyperventilation and how is it avoided?
  - (b) What are the symptoms and consequences of hypothermia?
  - (c) Why is CPR training recommended for those participating in swimming and snorkeling activities?



## Scuba BSA

### REQUIREMENTS

1. Before doing other requirements, successfully complete the BSA swimmer test. To begin the test, jump feetfirst into water over the head in depth, level off, and begin swimming. Swim 75 yards in a strong manner using one or more of the following strokes: sidestroke, breaststroke, trudgen, or crawl; then swim 25 yards using an easy, resting backstroke. The 100 yards must be completed in one swim without stops and must include at least one sharp turn. After completing the swim, rest by floating.
2. Discuss the importance of using the buddy system at all times while scuba diving. Explain that a dive buddy is there to assist with the donning and doffing of equipment, to lend assistance in case of emergency, and to share in the underwater experience. Remember, always dive with a buddy—***Never dive alone!***
3. Review hazards associated with scuba diving, including causes of decompression incidents, and safety procedures to avoid them. Explain the importance of never using scuba equipment unless you are enrolled in a training exercise, or have completed a diver certification program, taught by a certified instructor.

**By the end of a Water Skills Development session, the participants will be able to meet the following requirements in clear, confined water:**

4. State the purpose of the following pieces of basic diving equipment: mask, fins, BCD, BCD inflator, regulator, air gauge, and alternate air source.
5. Describe how to locate the air gauge, and explain how to recognize the “caution zone” on it.
6. Don and adjust mask, fins, snorkel, BCD, scuba, and weights with the assistance of a buddy, instructor, or certified assistant.
7. While underwater, demonstrate and recognize the following hand signals: Okay?/Okay!; Stop; Up; Down; Out of air; Come here; Ear problem; Slow down/Take it easy; Something is wrong; Watch me; Check your air supply.

8. Inflate/deflate a BCD at the surface using the low-pressure inflator.
9. In shallow water, demonstrate proper compressed air breathing habits; remember to breathe naturally and not hold the breath.
10. Clear the regulator while underwater using both exhalation and purge-button methods, and resume normal breathing from it.
11. In shallow water, recover a regulator hose from behind the shoulder while underwater.
12. In shallow water, clear a partially flooded mask while underwater.
13. Swim underwater with scuba equipment while maintaining control of both direction and depth, properly equalizing the ears and mask to accommodate depth changes.
14. While underwater, locate and read submersible pressure gauge and signal whether the air supply is adequate or low based on the gauge's caution zone.
15. In shallow water, breathe underwater for at least 30 seconds from an alternate air source supplied by the instructor.
16. Demonstrate the techniques for a proper ascent.

NOTE: The counselor for Scuba BSA must hold an instructor rating and be in current teaching status with PADI, NAUI, SSI, or other member of the RSTC in accordance with BSA scuba policies. Instruction must meet the minimum training standards for introductory scuba experiences set by the RSTC and guidelines provided in the Scuba BSA Brochure, No. 14-515. BSA scuba policies are provided in that brochure and also in the *Guide to Safe Scouting*.





## Mile Swim BSA (SWIM-TRUNKS EMBLEM ONLY)

### REQUIREMENTS

1. Explain how regular exercise contributes to good health and why swimming is one of the best forms of exercise.
2. Tell what precautions and procedures a swimmer and escort must follow for distance swimming over open water.
3. Under the supervision of a currently qualified certified aquatics instructor or equivalent, participate in four hours of training and preparation for distance swimming (one hour a day maximum).
4. Swim one mile over a measured course that has been approved by the trained instructor who will supervise the swim.



## Totin' Chip

This certification grants a Scout the right to carry and use woods tools. The Scout must show his Scout leader, or someone designated by his leader, that he understands his responsibility to do the following:

1. Read and understand woods tools use and safety rules from the *Boy Scout Handbook*.
2. Demonstrate proper handling, care, and use of the pocket knife, ax, and saw.
3. Use knife, ax, and saw as tools, not playthings.
4. Respect all safety rules to protect others.
5. Respect property. Cut living and dead trees only with permission and good reason.
6. Subscribe to the Outdoor Code.

The Scout's "Totin' Rights" can be taken from him if he fails in his responsibility.



## **Kayaking BSA**

### **REQUIREMENTS**

1. Before fulfilling the following requirements, successfully complete the BSA swimmer test.
2. Do the following:
  - (a) Describe various types of kayaks and how they differ in design, materials, and purpose.
  - (b) Name the parts of the kayak you are using for this exercise.
  - (c) Demonstrate how to choose an appropriately sized kayak paddle and how to position your hands.
3. Do the following:
  - (a) Tell what precautions must be taken for a safe trip afloat.
  - (b) Demonstrate how to select and properly fit a PFD.
  - (c) Explain the importance of safety equipment such as PFDs, air bags, grab loops, and helmets.
4. Demonstrate your ability to aid yourself and others in the event of a capsize:
  - (a) Capsize your kayak in water at least seven feet deep, perform a wet exit if necessary, and swim the boat to shore.
  - (b) With assistance, if needed, ready the capsized craft for use.
  - (c) Show how to approach a capsized paddler in your kayak and tow him to shore.
  - (d) While upright in your kayak, right a capsized kayak, empty it of water, and assist the paddler aboard without returning to shore.
5. As a solo paddler, demonstrate the following:
  - (a) Entering and launching a kayak from shore or dock
  - (b) Landing or docking and exiting a kayak
  - (c) Forward stroke
  - (d) Sweep stroke
  - (e) Reverse sweep

- (f) Draw stroke
  - (g) Rudder stroke
  - (h) Back stroke
6. As a solo paddler, do the following:
- (a) Paddle forward in a reasonably straight line.
  - (b) Move the kayak sideways to the right and to the left.
  - (c) Pivot 360 degrees to the right and left.
  - (d) Stop the kayak.



## World Conservation Award

You can earn this award by earning the following merit badges:

1. Environmental Science merit badge
2. Either Soil and Water Conservation OR Fish and Wildlife Management merit badge
3. Citizenship in the World merit badge

## Den Chief Service Award\*

### REQUIREMENTS

1. Serve the pack faithfully for one full year.
2. Attend Den Chief Training (if available within year of service)  
OR be trained by the assistant Cubmaster and den leader.
3. Know and understand the purposes of Cub Scouting.
4. Help Cub Scouts achieve the purposes of Cub Scouting.
5. Be the activities assistant in den meetings.
6. Set a good example by attitude and uniforming.
7. Be a friend to the boys in the den.
8. Take part in weekly meetings.
9. Assist the den at the monthly pack program.

\*See *Den Chief Handbook*, No. 33211, for detailed requirements.

10. Meet as needed with the adult members of the den, pack, troop, team, or crew.
11. Complete FOUR of these projects:
  - (a) Serve as a staff member of a special Cub Scouting event, such as a Scouting show, bicycle rodeo, etc.
  - (b) Serve as a staff member of a Cub Scout day camp or resident camp.
  - (c) Advance one rank.
  - (d) Assist in recruiting three new Cub Scouts.
  - (e) Assist three Cub Scouts to become Webelos Scouts.
  - (f) Assist three Webelos Scouts to join a troop.
  - (g) Help to plan and carry out a joint pack-troop activity.
  - (h) Recommend to your Scoutmaster, Varsity Scout Coach, or Venturing Advisor another Boy Scout, Varsity Scout, or Venturer to be a den chief.

## Religious Emblems

“A Scout is reverent.” All Scouts show this by being faithful in their duty to God. Some go further and give special service. This can qualify them for a religious emblem. Such an emblem is not a Scouting award. It is conferred on a Scout by his religious leader. Each faith has its own requirements for earning its emblem. Listed below are the emblems and where to find out about them. Before writing or visiting your local council service center, check with your religious leader.

**African Methodist Episcopal Church—God and Church; God and Life.** Local council service center or P.R.A.Y., 11123 S. Towne Square, Suite B, St. Louis, MO 63123; telephone: 800-933-7729; e-mail: [info@praypub.org](mailto:info@praypub.org); website: <http://www.praypub.org>.

**African Methodist Episcopal Zion Church—God and Church; God and Life.** Local council service center or P.R.A.Y., 11123 S. Towne Square, Suite B, St. Louis, MO 63123; telephone: 800-933-7729; e-mail: [info@praypub.org](mailto:info@praypub.org); website: <http://www.praypub.org>.

**Anglican Catholic Church—Serbus Dei.** Anglican Parishes Association, 800 Timothy Road, Athens, GA 30606; telephone: 706-546-6910.

**Armenian Apostolic Church of America (Western Prelacy)—Saint Mesrob.** 6252 Honolulu Ave., Suite 100, Los Angeles, CA 91214; telephone: 818-248-7737.

**Armenian Church of America (Eastern Diocese)—Ararat.** Department of Youth and Education, Diocese of the Armenian Church of America, 630 Second Ave., New York, NY 10016; telephone: 212-686-0710.

**Bahá'í—Unity of Mankind.** Bahá'í Committee on Scouting, Bahá'í National Center, Education and Schools Office, 1233 Central St., Evanston, IL 60201-1611; telephone: 847-733-3492; website: [http://www.education.usbnc.org/child\\_spir\\_ed/scoutin.htm](http://www.education.usbnc.org/child_spir_ed/scoutin.htm).

**Baptist—God and Church; God and Life.** Local council service center or P.R.A.Y., 11123 S. Towne Square, Suite B, St. Louis, MO 63123; telephone: 800-933-7729; e-mail: [info@praypub.org](mailto:info@praypub.org); website: <http://www.praypub.org>.

**Buddhist—Sangha.** National Buddhist Committee on Scouting, 415 42nd Ave., San Mateo, CA 94403-5005, telephone: 650-574-4527; fax: 408-756-3288; e-mail: [viwamura@sbcglobal.net](mailto:viwamura@sbcglobal.net); website: <http://www.geocities.com/bcascout>.

**Christian Church (Disciples of Christ)—God and Church; God and Life.** Local council service center or P.R.A.Y., 11123 S. Towne Square, Suite B, St. Louis, MO 63123; telephone: 800-933-7729; e-mail: [info@praypub.org](mailto:info@praypub.org); website: <http://www.praypub.org>.

**Christian Methodist Episcopal Church—God and Church; God and Life.** Local council service center or P.R.A.Y., 11123 S. Towne Square, Suite B, St. Louis, MO 63123; telephone: 800-933-7729; e-mail: [info@praypub.org](mailto:info@praypub.org); website: <http://www.praypub.org>.

**Church of Jesus Christ of Latter-day Saints (LDS)—On My Honor.** LDS Relationships—BSA; 15 West South Temple, Suite 1070; Salt Lake City, UT 84101-1579; telephone 801-530-0004.

**Churches of Christ—Good Servant.** Members of Churches of Christ for Scouting, 401 Cypress, Suite 406, Abilene, TX 79601; telephone: 325-370-1679; e-mail: [info@goodservant.org](mailto:info@goodservant.org); website: <http://www.goodservant.org>.

**Community of Christ (World Community Program Series)—Path of the Disciple; Exploring Community Together.** Scouting Liaison, Forefront Ministries, 1001 W. Walnut St., Independence, MO 64050; telephone: 816-833-1000 or 800-825-2806, ext. 1374; website: <http://www.cofchrist.org>.

**Eastern Catholic—Light Is Life; Pope Pius XII.** Local council service center, diocesan Scout office, or National Catholic Committee on Scouting; 1325 West Walnut Hill Lane, P.O. Box 152079, Irving, TX 75015-2079; telephone: 972-580-2114; website: <http://www.nccs-bsa.org>.

**Eastern Orthodox—Alpha Omega.** P.R.A.Y., 11123 S. Towne Square, Suite B, St. Louis, MO 63123; telephone: 800-933-7729; e-mail: [info@praypub.org](mailto:info@praypub.org); websites: <http://www.praypub.org> or <http://www.eocs.org>.

**Episcopal—God and Church; God and Life.** Local council service center or P.R.A.Y., 11123 S. Towne Square, Suite B, St. Louis, MO 63123; telephone: 800-933-7729; e-mail: [info@praypub.org](mailto:info@praypub.org); website: <http://www.praypub.org>.

**General Church of the New Jerusalem (The New Church)—Open Word Award.** Chairman, Boy Scout Relations Committee, General Church of the New Jerusalem, P.O. Box 277, Bryn Athyn, PA 19009; telephone: 215-938-2542; fax: 215-938-2617.

**Hindu—Dharma, Karma.** North American Hindu Association, 847 E. Angela St., Pleasanton, CA 94566-7568; telephone/fax: 925-846-3811; e-mail: [info@naha.us](mailto:info@naha.us); website: <http://www.naha.us>.

**Islamic—In the Name of God.** Mr. Syed Naqvi; telephone: 732-801-1283; e-mail: [islamicbsa@aol.com](mailto:islamicbsa@aol.com) or [read@koranusa.org](mailto:read@koranusa.org).

**Jewish—Ner Tamid; Etz Chaim.** Local council service center or P.R.A.Y., 11123 S. Towne Square, Suite B, St. Louis, MO 63123; telephone: 800-933-7729; e-mail: [info@praypub.org](mailto:info@praypub.org); websites: <http://www.praypub.org> or <http://www.jewishscouting.org>.

**Lutheran—God and Church; God and Life.** Local council service center or P.R.A.Y., 11123 S. Towne Square, Suite B, St. Louis, MO 63123; telephone: 800-933-7729; e-mail: [info@praypub.org](mailto:info@praypub.org); websites: <http://www.praypub.org> or <http://www.nlas.org>.

**Meher Baba—Compassionate Father.** Committee for Meher Baba and Scouting, 912 Ninth Ave. S, North Myrtle Beach, SC 29582; telephone: 843-272-3498.

**Moravian—God and Country.** The Moravian Church, Drawer Y, Winston-Salem, NC 27108; telephone: 336-722-8126.

**National Association of Anglican and Traditional Catholic Scouters—God and Life.** Local council service center or P.R.A.Y., 11123 S. Towne Square, Suite B, St. Louis, MO 63123; telephone: 800-933-7729; e-mail: [info@praypub.org](mailto:info@praypub.org); website: <http://www.praypub.org>.

**Polish National Catholic Church—God and Country (Bog I Ojczyzna).** Mr. Richard Daum, 11 Everette Place, Wayne, NJ 07470; telephone 973-694-9457; e-mail: [rodaum@verizon.net](mailto:rodaum@verizon.net).

**Presbyterian Church in America—God and Church; God and Life.**

Local council service center or P.R.A.Y., 11123 S. Towne Square, Suite B, St. Louis, MO 63123; telephone: 800-933-7729; e-mail: [info@praypub.org](mailto:info@praypub.org); website: <http://www.praypub.org>.

**Presbyterian Church (U.S.A.)—God and Church; God and Life.**

Local council service center or P.R.A.Y., 11123 S. Towne Square, Suite B, St. Louis, MO 63123; telephone: 800-933-7729; e-mail: [info@praypub.org](mailto:info@praypub.org); websites: <http://www.praypub.org> or <http://www.presbyterianscouters.org>.

**Protestant and Independent Christian Churches—God and Church; God and Life.**

Local council service center or P.R.A.Y., 11123 S. Towne Square, Suite B, St. Louis, MO 63123; telephone: 800-933-7729; e-mail: [info@praypub.org](mailto:info@praypub.org); website: <http://www.praypub.org>.

**Religious Society of Friends (Quakers)—Spirit of Truth.**

P.R.A.Y., 11123 S. Towne Square, Suite B, St. Louis, MO 63123; telephone: 800-933-7729; e-mail: [info@praypub.org](mailto:info@praypub.org); websites: <http://www.praypub.org> or <http://www.scouting.quaker.org>.

**Roman Catholic—Ad Altare Dei; Pope Pius XII.** Local council service center, diocesan Scout office; or BSA Supply Group (telephone: 800-323-0732); websites: <http://www.praypub.org> or <http://www.nccs-bsa.org>.

**The Salvation Army—God and Church; God and Life.** P.O. Box 269, Alexandria, VA 22313; Eastern Territory, telephone: 914-620-7427; Central Territory, telephone: 847-294-2112; Southern Territory, telephone: 404-728-1363; Western Territory, telephone: 310-544-6434.

**Scientist Church of Christ—God and Country.**

P.R.A.Y., 11123 S. Towne Square, Suite B, St. Louis, MO 63123; telephone: 800-933-7729; e-mail: [info@praypub.org](mailto:info@praypub.org); website: <http://www.praypub.org>.

**Unitarian Universalist Scouters Organization—Living Your Religion.**

P.R.A.Y., 11123 S. Towne Square, Suite B, St. Louis, MO 63123; telephone: 800-933-7729; e-mail: [info@praypub.org](mailto:info@praypub.org); website: <http://www.praypub.org>.

**United Church of Christ—God and Church; God and Life.**

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**Zoroastrian—Good Life.** The Zoroastrian Association of Greater New York, c/o Ms. Temilyn Mahta, National Coordinator, The Good Life Program, 12 Rockwell Circle, Marlboro, NJ 07746; telephone: 732-972-6527; e-mail: [tghad@hotmail.com](mailto:tghad@hotmail.com).





## Merit Badges I Have Earned

### Merit Badges Required for Eagle

### Date Earned

Camping	_____
Citizenship in the Community	_____
Citizenship in the Nation	_____
Citizenship in the World	_____
Communication	_____
Environmental Science	_____
Family Life	_____
First Aid	_____
Personal Fitness	_____
Personal Management	_____
Cycling OR Hiking OR Swimming	_____
Emergency Preparedness OR Lifesaving	_____

### Other Merit Badges I Have Earned

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## Notes

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## MERIT BADGE LIBRARY

Though intended as an aid to Boy Scouts, Varsity Scouts, and qualified Venturers and Sea Scouts in meeting merit badge requirements, these pamphlets are of general interest and are made available by many schools and public libraries. The latest revision date of each pamphlet might not correspond with the copyright date shown below, because this list is corrected only once a year, in January. Any number of merit badge pamphlets may be revised throughout the year; others are simply reprinted until a revision becomes necessary.

If a Scout has already started working on a merit badge when a new edition for that pamphlet is introduced, *he may continue to use the same merit badge pamphlet to earn the badge and fulfill the requirements therein.* In other words, the Scout need not start over again with the new pamphlet and possibly revised requirements.

Merit Badge Pamphlet	Year	Merit Badge Pamphlet	Year	Merit Badge Pamphlet	Year
American Business	2002	Entrepreneurship	2006	Photography	2005
American Cultures	2005	Environmental Science	2006	Pioneering	2006
American Heritage	2005	Family Life	2005	Plant Science	2005
American Labor	2006	Farm Mechanics	2008	Plumbing	2004
Animal Science	2006	Fingerprinting	2003	Pottery	2008
Archaeology	2006	Fire Safety	2004	Public Health	2005
Archery	2004	First Aid	2007	Public Speaking	2002
Architecture and Landscape Architecture	2010	Fish and Wildlife Management	2004	Pulp and Paper	2006
Art	2006	Fishing	2009	Radio	2008
Astronomy	2010	Fly-Fishing	2009	Railroading	2003
Athletics	2006	Forestry	2005	Reading	2003
Automotive Maintenance	2008	Gardening	2002	Reptile and Amphibian Study	2005
Aviation	2006	Genealogy	2005	Rifle Shooting	2001
Backpacking	2007	Geocaching	2010	Rowing	2006
Basketry	2003	Geology	2005	Safety	2006
Bird Study	2005	Golf	2002	Salesmanship	2003
Bugling (see Music)		Graphic Arts	2006	Scholarship	2004
Camping	2005	Hiking	2007	Scouting Heritage	2010
Canoeing	2004	Home Repairs	2009	Scuba Diving	2009
Chemistry	2004	Horsemanship	2010	Sculpture	2007
Cinematography	2008	Indian Lore	2008	Shotgun Shooting	2005
Citizenship in the Community	2005	Insect Study	2008	Skating	2005
Citizenship in the Nation	2005	Inventing	2010	Small-Boat Sailing	2004
Citizenship in the World	2005	Journalism	2006	Snow Sports	2007
Climbing	2006	Landscape Architecture (see Architecture)		Soil and Water Conservation	2004
Coin Collecting	2008	Law	2003	Space Exploration	2004
Collections	2008	Leatherwork	2002	Sports	2006
Communication	2009	Lifesaving	2008	Stamp Collecting	2007
Composite Materials	2006	Mammal Study	2003	Surveying	2004
Computers	2009	Medicine	2009	Swimming	2008
Cooking	2007	Metalwork	2007	Textile	2003
Crime Prevention	2005	Model Design and Building	2010	Theater	2005
Cycling	2003	Motorboating	2008	Traffic Safety	2006
Dentistry	2006	Music and Bugling	2010	Truck Transportation	2005
Disabilities Awareness	2005	Nature	2003	Veterinary Medicine	2005
Dog Care	2003	Nuclear Science	2010	Water Sports	2007
Drafting	2008	Oceanography	2009	Weather	2006
Electricity	2004	Orienteering	2003	Whitewater	2005
Electronics	2004	Painting	2008	Wilderness Survival	2007
Emergency Preparedness	2008	Personal Fitness	2006	Wood Carving	2006
Energy	2005	Personal Management	2003	Woodwork	2003
Engineering	2008	Pets	2003		

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