“Enhancing our youths’ competitive edge through merit badges”
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.

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.

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**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. Demonstrate their proper use.

(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:

**Option A—Rifle Shooting (Modern cartridge type)**

(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) Explain to your counselor the fundamental rules for safe gun handling. Explain each rule for using and storing a gun. Identify and explain each rule for safe shooting.

(g) Explain the range commands and range procedures.

(h) 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.

(i) Identify the basic safety rules for cleaning a rifle, and identify the materials needed.

(j) Demonstrate how to clean a rifle properly and safely.

(k) Discuss what points you would consider in selecting a rifle.

(l) 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.

(m) 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.

**Option B—Air Rifle Shooting (BB or pellet)**

(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) Explain the range commands and range procedures.

(d) Identify the two most common types of air rifle ammunition.

(e) Identify and demonstrate the five fundamentals of shooting a rifle safely.
(f) Identify and explain each rule for shooting an air rifle safely.

(g) 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.

(h) Identify the basic safety rules for cleaning an air rifle, and identify the materials needed.

(i) Demonstrate how to clean an air rifle safely.

(j) Discuss what points you would consider in selecting an air rifle.

(k) 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.

(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) 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.

**Option C—Muzzleloading Rifle Shooting**

(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 black powder substitutes and explain 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 muzzleloading 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.

(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.

*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.*
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.

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.

**Robotics**

1. **Safety.** Do each of the following:
   
   (a) Explain to your counselor the most likely hazards you may encounter while working with robots and what you should do to anticipate, mitigate and prevent, and respond to these hazards. Describe the appropriate safety gear and clothing that should be used when working with robotics.
   
   (b) Discuss first aid and prevention for the types of injuries that could occur while participating in robotics activities and competitions, including cuts, eye injuries, and burns (chemical or heat).

2. **Robotics industry.** Discuss the following with your counselor:
   
   (a) The kinds of things robots can do and how robots are best used today.
   
   (b) The similarities and differences between remote-control vehicles, telerobots, and autonomous robots.
   
   (c) Three different methods robots can use to move themselves other than wheels or tracks. Describe when it would be appropriate to use each method.

3. **General knowledge.** Discuss with your counselor three of the five major fields of robotics (human-robot interface, mobility, manipulation, programming, sensors) and their importance to robotics development. Discuss either the three fields as they relate to a single robot system OR talk about each field in general. Find pictures or at least one video to aid your discussion.

4. **Design, build, program, test.** Do each of the following:
   
   (a) With your counselor’s approval, choose a task for the robot or robotic sub-system that you plan to build. Include sensor feedback and programming in the task. Document this information in your robot engineering notebook.
   
   (b) Design your robot. The robot design should use sensors and programming and have at least 2 degrees of freedom. Document the design in your robot engineering notebook using drawings and a written description.
   
   (c) Build a robot or robotic subsystem of your original design to accomplish the task you chose for requirement 4a.
Resources

Scouting Literature
Archery, Environmental Science, Fish and Wildlife Management, and Shotgun Shooting merit badge pamphlets; Guide to Safe Scouting; Health and Safety Guide

Visit the Boy Scouts of America’s official retail website at http://www.scoutstuff.org for a complete listing of all merit badge pamphlets and other helpful Scouting materials and supplies.

Rifles and Rifle Shooting


Muzzleloaders


Organizations and Websites
Alco Target Company
Toll-free telephone: 888-258-4814
Website: http://www.alcotarget.com

American Target Company
Telephone: 303-733-0433

Central Target Company
Telephone: 502-895-3390

Michaels of Oregon
Toll-free telephone: 800-962-5757
Website: http://www.hoppes.com or http://www.michaelsoregon.com

National Rifle Association
Website: http://www.nra.org

National Target Company
Toll-free telephone: 800-827-7060
Website: http://www.nationaltarget.com

Target Barn Inc.
Telephone: 419-829-2242
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Bruce Levitt—page 22

John McDearmon—All illustrations