

SCOUTS BSA MERIT BADGE COMMITTEE
Draft Merit Badge Requirement Updates (Effective January 1, 2025)

MERIT BADGE	UPDATED REQUIREMENT	ORIGINAL REQUIREMENT
Animal Science	1. Name two breeds of livestock in each of the following classifications: horses, dairy cattle, beef cattle, sheep, hogs, poultry, and goats. Tell their principal uses and merits. Tell where the breeds originated.	1. Name four breeds of livestock in each of the following classifications: horses, dairy cattle, beef cattle, sheep, hogs, poultry, and goats. Tell their principal uses and merits. Tell where the breeds originated.
Animal Science	2. List two diseases that afflict the animals in each of the classifications in requirement 1. Describe the symptoms of each disease and explain how each is contracted and how it could be prevented.	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.
Animal Science	3. Draw models of the digestive tracts of ruminants, horses, pigs, and poultry. Explain how the differences in structure and function among these types of digestive tracts affect the nutritional management of these species.	3. Explain the differences in the digestive systems of ruminants, horses, pigs, and poultry. Explain how the differences in structure and function among these types of digestive tracts affect the nutritional management of these species.
Animal Science	5. Do the following: a. Explain how agricultural producers make desired improvements to their stock through breeding practices and programs. b. Explain the terms pure breeding and cross breeding. c. List two modern technologies used in the production of horses, dairy cattle, beef cattle, sheep, hogs, poultry, or goats. and tell what the advantages are of using the technology.	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 crossbreeding and the value of this practice.
Animal Science	6. Sheep or Goat Option (choose one and complete the following based upon the choice) a. Make a sketch of a live lamb or goat. Show the location of the various wholesale and retail cuts. b. Discuss how wools are sorted and graded. c. List products that can be made from the milk. d. Based on your choice, do ONE of the following: 1. Raise a lamb or goat from weaning to market weight. Keep records of feed intake, weight gains, medication, vaccination, and mortality. Present your records to your counselor for review. 2. Visit a farm or ranch where sheep or goats are raised. Describe what you saw and explain what you learned. If you cannot visit a sheep or goat farm or ranch, view a video from a breed association, or research the Internet (with your parent's permission) for information on sheep or goats. Tell about your findings. e. Define the following terms for a sheep (wether, ewe, ram, lamb) OR a goat (doe, nanny, kid, buck, billy).	6. 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 to your counselor for review. 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 or guardian'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.
Archery	1. Do the following: a. Explain what a projectile is, and why any device that shoots a projectile at high speed must be handled with care and respect, and used only in approved locations. b. Explain the five range safety rules. c. Explain the four whistle commands used on the range. d. Explain how to safely remove arrows from the target and return them to your quiver. e. Tell your counselor about your local and state laws for owning and using archery equipment.	1. Do the following: a. Explain the five range safety rules. b. Explain the four whistle commands used on the range. c. Explain how to safely remove arrows from the target and return them to your quiver. d. Tell about your local and state laws for owning and using archery equipment.
Archery	5. Working under the supervision of a certified USA Archery Level 1 Instructor or a certified long-term camp staff member (i.e., a National Camping School [NCS] Range Activities Director; or a Rangemaster over age 18 who is trained by a NCS Range Activities Director or by a USA Archery Level 1 Instructor), do ONE of the following Options:	5. Do ONE of the following options.
Archery	5 Option 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. Demonstrate and explain USA Archery's eleven "Steps of Shooting" for the bow you are shooting. d. Demonstrate the proper way to string a recurve bow or longbow. e. Using a bow square, 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: a. NFAA field round of 14 targets and make a score of 60 points b. Scouting America field round of 14 targets and make a score of 80 points c. A World Archery/USA Archery indoor round and make a score of 80 points (indoor rounds may be shot outdoors if this is more convenient) d. An NFAA indoor round and make a score of 50 points (indoor rounds may be shot outdoors if this is more convenient) 2. Shooting 30 arrows in five-arrow ends at an 80-centimeter (32-inch) five-color target at 10 yards and using the 10 scoring regions, make a score of 150 points.	5 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. Demonstrate and explain USA Archery's "Steps of Shooting" for the bow you are shooting. d. Demonstrate the proper way to string a recurve bow or longbow. e. Using a bow square, 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, USA Archery, 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. World Archery/USA Archery indoor* round and make a score of 80 points d. An NFAA indoor* round and make a score of 50 points *The indoor rounds can be shot outdoors if this is more convenient. 2. Shooting 30 arrows in five-arrow ends at an 80-centimeter (32-inch five-color target at 10 yards and using the 10 scoring regions, make a score of 150 points. 3. As a member of the USA Archery Junior Olympic Archery Development program (JOAD), earn your indoor or outdoor green, purple, and gray achievement award pins using a recurve bow or longbow. 4. As a member of the NFAA's Junior Division, earn a Cub or Youth 100-score Progression Patch.

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Archery	<p>5 Option B: Compound Bow</p> <p>a. Name and point to the parts of the compound bow you are shooting.</p> <p>b. Explain how to properly care for and store compound bows.</p> <p>c. Demonstrate and explain USA Archery’s eleven “Steps of Shooting” for the bow you are shooting.</p> <p>d. Explain why it is necessary to have the string or cable on a compound bow replaced at an archery shop.</p> <p>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.</p> <p>f. Do ONE of the following:</p> <p>1. Using a compound bow and arrows with a finger release, shoot a single round of ONE of the following:</p> <p>a. NFAA field round of 14 targets and make a score of 70 points</p> <p>b. Scouting America field round of 14 targets and make a score of 90 points</p> <p>c. World Archery/USA Archery indoor round and make a score of 90 points (indoor rounds may be shot outdoors if this is more convenient)</p> <p>d. NFAA indoor round and make a score of 60 points (indoor rounds may be shot outdoors if this is more convenient).</p> <p>2. Shooting at an 80-centimeter (32-inch) five-color target using the 10 scoring regions, make a minimum score of 160 points. Accomplish this in the following manner: Shoot 15 arrows in five-arrow ends, at a distance of 10 yards AND Shoot 15 arrows in five-arrow ends, at a distance of 15 yards.</p>	<p>5 Option B—Using a Compound Bow</p> <p>a. Name and point to the parts of the compound bow you are shooting.</p> <p>b. Explain how to properly care for and store compound bows.</p> <p>c. Demonstrate and explain USA Archery’s “Steps of Shooting” for the bow you are shooting.</p> <p>d. Explain why it is necessary to have the string or cable on a compound bow replaced at an archery shop.</p> <p>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.</p> <p>f. Do ONE of the following:</p> <p>1. Using a compound bow and arrows with a finger release, shoot a single round of one of the following BSA, USA Archery, or NFAA rounds:</p> <p>a. An NFAA field round of 14 targets and make a score of 70 points</p> <p>b. A BSA Scout field round of 14 targets and make a score of 90 points</p> <p>c. A World Archery/USA Archery indoor* round and make a score of 90 points</p> <p>d. An NFAA indoor* round and make a score of 60 points</p> <p>2. Shooting at an 80-centimeter (32-inch) five-color target using the 10 scoring regions, make a minimum score of 160 points. Accomplish this in the following manner: Shoot 15 arrows in five-arrow ends, at a distance of 10 yards AND Shoot 15 arrows in five-arrow ends, at a distance of 15 yards.</p> <p>3. As a member of the USA Archery Junior Olympic Archery Development program (JOAD), earn your indoor or outdoor green, purple, and gray achievement award pins using a compound bow.</p> <p>4. As a member of the NFAA’s Junior Division, earn a Cub or Youth 100-score Progression Patch.</p>
Astronomy	<p>4. Do the following (if instruction is done in a planetarium, Scouts must still identify the required stars and constellations outside under the natural night sky):</p> <p>a. Identify in the sky 10 constellations, at least four of which are in the zodiac.</p> <p>b. Identify in the sky eight conspicuous stars, five of which are of magnitude 1 or brighter.</p> <p>c. Make two sketches of the Big Dipper or Cassiopeia from direct observation. In one sketch, show the Big Dipper’s or Cassiopeia’s orientation in the early evening sky. Make another sketch, showing its position several hours later. In both sketches, show the North Star and the horizon. Record the date and time each sketch was made.</p> <p>d. Explain what we see when we look at the Milky Way.</p>	<p>4. Do the following*:</p> <p>a. Identify in the sky at least 10 constellations, at least four of which are in the zodiac.</p> <p>b. Identify in the sky at least eight conspicuous stars, five of which are of magnitude 1 or brighter.</p> <p>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.</p> <p>d. Explain what we see when we look at the Milky Way.</p>
Astronomy	<p>6. Do the following:</p> <p>a. Sketch the face of the Moon and indicate five seas and five craters. Label these landmarks.</p> <p>b. Sketch the phase and position of the Moon, at the same hour and place, for four nights (or days) within a one-week period by direct observation. Include landmarks on the horizon such as hills, trees, and buildings. Explain the changes you observe.</p> <p>c. List the factors that keep the Moon in orbit around Earth.</p> <p>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.</p>	<p>6. Do the following:</p> <p>a. Sketch the face of the Moon and indicate at least five seas and five craters. Label these landmarks.</p> <p>b. Sketch the phase and position of the Moon, at the same hour and place, for four nights within a one-week period. Include landmarks on the horizon such as hills, trees, and buildings. Explain the changes you observe.</p> <p>c. List the factors that keep the Moon in orbit around Earth.</p> <p>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.</p>
Astronomy	<p>8b. Plan and participate in an observation session that includes using binoculars or a telescope and includes at least 10 celestial objects beyond those observed in requirement 4. These might be lunar features, Messier objects, additional constellations or planets, or artificial satellites including the International Space Station. List the celestial objects you want to observe and find each in a star chart, guidebook or by using an app. Prepare a log or notebook. Discuss with your counselor what you hope to observe prior to your observation session. Review your log or notebook with your counselor afterward.</p>	<p>8b. 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 a log or notebook. Discuss with your counselor what you hope to observe prior to your observation session. Review your log or notebook with your counselor afterward.</p>
Astronomy	<p>(new) 8f. With your parent or guardian and counselor’s approval, use online observing opportunities such as SkyNet to observe planets, comets, galaxies, and/or the sun. Describe your experience to your counselor.</p>	
Astronomy	<p>9. Do ONE of the following:</p> <p>a. Identify three career opportunities that would use skills and knowledge in astronomy. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.</p> <p>b. Identify how you might use the skills and knowledge in astronomy to pursue a personal hobby. Research the additional training required, expenses, and affiliation with organizations that would help you maximize the enjoyment and benefit you might gain from it. Discuss what you learned with your counselor and share what short-term and long-term goals you might have if you pursued this.</p>	<p>9. Find out about three career opportunities in astronomy. 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.</p>

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Aviation	<p>1. Aviation Basics and Mechanics of Flight. Do the following:</p> <ul style="list-style-type: none"> a. Define “aircraft”. Describe three kinds of aircraft today, and their typical uses. b. Provide a brief overview of the evolution of flight, and discuss three notable times in history important to aviation. c. Explain the difference between a fixed wing and a rotary wing aircraft, and the benefits of each. d. Explain the operation of piston, turbine, and jet engines. e. Using a model aircraft, describe the four forces that act on an aircraft in flight. f. Explain how an airfoil generates lift, specifically noting Bernoulli’s principle. g. Identify and describe the aerodynamic control surfaces on the aircraft of your choice, and explain how they operate to control its attitude and direction of flight. h. 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, communication, and engine performance indicators. 	<p>1. Do the following:</p> <ul style="list-style-type: none"> 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 sport pilot, the recreational pilot, and the private pilot certificates; the instrument rating.
Aviation	<p>2. Principles of Flight. Do ONE of the following:</p> <ul style="list-style-type: none"> a. 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. b. Build a rubber-band driven balsa wood airplane. Fly the plane for 25 feet, with a successful take-off and landing. c. Build (or obtain) a fuel-driven or battery-powered electric model aircraft or drone. Obtain The Recreational UAS Safety Test (TRUST) certification, and fly the aircraft with a successful take-off and landing. 	<p>2. Do TWO of the following:</p> <ul style="list-style-type: none"> a. Take a flight in an aircraft, with your parent or guardian’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 to determine 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. 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. f. Create an original poster of an aircraft instrument panel. Include and identify the instruments and radios discussed in requirement 2e.
Aviation	<p>3. Flight Operations. Do TWO of the following:</p> <ul style="list-style-type: none"> a. Using a flight simulator software package, set a course and fly the headings you have established with a successful take-off and landing. b. Under supervision, perform a preflight inspection of an aircraft. c. Observe and/or participate in an aircraft maintenance activity. Describe the maintenance schedule and requirements for an aircraft of your choice. d. 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 to determine a navigational heading for an aircraft. e. With your parents or guardian’s permission, take a discovery flight in an aircraft. Record the date, place, type of aircraft, and duration of flight. Report on your impressions of the flight. 	<p>3. Do ONE of the following:</p> <ul style="list-style-type: none"> 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.
Aviation	<p>4. Airport Operations. Do ONE of the following:</p> <ul style="list-style-type: none"> 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: Airport Traffic Control Tower (ATCT), Terminal Radar Approach Control (TRACON), Air Route Traffic Control Center (ARTCC), or Flight Standards District Office (FSDO). Report on the operation and your impressions of the facility. c. Visit a military aviation facility. Learn how that facility supports defense and/or civilian activities. Report on the operation and your impressions of the facility. d. Visit an aviation museum or attend an air show. Report on your impressions of the museum or show, and what you learned from the experience. 	<p>4. Do ONE of the following:</p> <ul style="list-style-type: none"> 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, 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.

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Aviation	<p>5. Personal & Professional Aviation Opportunities. Do the following:</p> <p>a. Explain the following: the student pilot, the recreational pilot, the remote pilot, and the private pilot certificates.</p> <p>b. Describe the benefits of the instrument rating.</p> <p>c. Explain the following: the commercial pilot certificate, the airline transport pilot certificate, and certified flight instructor (CFI).</p> <p>d. Identify an Aviation Exploring Post and/or Civil Air Patrol facility in your area. Learn about their activities and membership requirements.</p> <p>e. Identify three career opportunities that would use skills and knowledge in aviation. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.</p>	<p>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.</p>
Chemistry	<p>1. Do the following and discuss with your counselor:</p> <p>a. Obtain safety data sheets (SDS) for sucrose (sugar), isopropyl alcohol (rubbing alcohol), and a waterproofing spray. Compare their properties and potential hazard(s), including handling and disposal guidelines and toxicity information.</p> <p>b. What types of personal protective equipment (PPE) are recommended for each, and why? How does the recommended PPE change with toxicity and route of exposure?</p> <p>c. Review the pictograms in Section 2 of each SDS. What do they mean, and how do you see them used in your community?</p> <p>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?</p>	<p>1. Do EACH of the following:</p> <p>a. Describe three examples of safety equipment used in a chemistry laboratory and the reason each one is used.</p> <p>b. Describe what a safety data sheet (SDS) is and tell why it is used.</p> <p>c. Obtain an SDS for both a paint and an insecticide. Compare and discuss the toxicity, disposal, and safe-handling sections for these two commonhousehold products.</p> <p>d. Discuss the safe storage of chemicals. How does safe storage apply to your home, your school, your community, and the environment?</p>
Chemistry	<p>2. Chemistry and First Aid. After successfully completing requirement 1, do the following:</p> <p>a. Discuss with your counselor why you think soap and alcohol are used to clean cuts and scrapes. Discuss how you could test your hypotheses with your counselor.</p> <p>b. Coat your hands with a mixture of cooking oil and a nontoxic powder, such as sand or cocoa. Wash your hands with water and observe what happens. Coat your hands again, then wash with soap and water. Discuss the differences with your counselor.</p> <p>c. Perform an experiment to demonstrate how rubbing alcohol affects microbial growth using baker's yeast. Discuss the results with your counselor.</p>	<p>2. Do EACH of the following:</p> <p>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.</p> <p>b. Demonstrate how you would separate sand (or gravel) from water. Describe how you would separate table salt from water, oil from water, and gasoline from motor oil. Name the practical processes that require these kinds of separations and how the processes may differ.</p> <p>c. Describe the difference between a chemical reaction and a physical change. Observe one of each and share your observations with your counselor.</p>
Chemistry	<p>3. Chemistry in the Kitchen. After successfully completing requirement 1, do EACH of the following:</p> <p>a. Perform a Maillard, or browning, reaction. Discuss with your counselor whether a physical or chemical change has occurred, and what happened to molecules in the food during the cooking process.</p> <p>b. Prepare and use red cabbage indicator to measure the pH of five common household liquids, including water. Discuss your observations with your counselor.</p>	<p>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.</p>
Chemistry	<p>4. Chemistry and Camping. After successfully completing requirement 1, do TWO of the following:</p> <p>a. Design and conduct an experiment to compare at least two different types of waterproofing. Discuss with your counselor which one you would prefer to use on your tent and which one you would prefer to use on your boots, and why.</p> <p>b. Describe the four classes of fires, and the four classes of fire extinguishers. Discuss with your counselor how sand, baking soda, and the four classes of extinguishers work to put out fires.</p> <p>c. Under your counselor's supervision and/or the supervision of a knowledgeable adult approved in advance by your counselor, conduct flame tests of at least five elements using a kitchen or propane torch.</p> <p>d. Under your counselor's supervision and/or the supervision of a knowledgeable adult approved in advance by your counselor, synthesize nylon (may be from a kit).</p>	<p>4. Do EACH of the following:</p> <p>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.</p> <p>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.</p> <p>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.</p>

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Chemistry	5. Describe how chemistry can be used to reduce the environmental impacts of single-use items, such as water bottles, bags, straws, or batteries.	5. Discuss with your counselor the 5 classical areas of chemistry (organic, inorganic, physical, analytical and biological), and two others from the following list. Explain what they are, and how they impact your daily life. a. Agricultural chemistry b. Atmospheric chemistry c. Computational chemistry d. Electrochemistry e. Environmental chemistry and green chemistry f. Flavor chemistry, fragrance chemistry, and food chemistry g. Medicinal and natural products chemistry h. Photochemistry i. Polymer chemistry j. Or another area of chemistry of your choosing
Chemistry	6. Identify five fields of chemistry. Briefly describe each, tell how each applies to your life and how they interact.	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. b. Define pollution. Explain the chemical impacts on the ozone layer and global climate change. c. Using reasons from chemistry, describe the effect on the environment of ONE of the following: 1. The production of aluminum cans 2. Burning fossil fuels 3. Single-use items, such as water bottles, bags, straws, or paper d. Briefly describe the purpose of phosphates in fertilizer and in laundry detergent. Explain how the use of phosphates in fertilizers affects the environment. Explain why phosphates have been removed from laundry detergents.
Chemistry	7. Identify three government agencies that oversee or provide guidance on the use of chemicals for personal, pharmaceutical, commercial, or industrial use, and discuss the agencies' history and responsibilities with your counselor.	7. Do ONE of the following activities: a. Visit a laboratory and talk to a chemist. Ask what that 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 or guardian's permission), learn about two different kinds of work done by chemists, chemical engineers, chemical technicians, or industrial chemists. For each of the four positions, 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, by-products 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.
Chemistry	8. Do ONE of the following: a. Visit a research laboratory, and discuss the research performed there with a chemist or chemical technician. Learn what education and training they received. b. Visit a company or plant that makes chemical products or uses chemical processes. Learn about their products or processes, and talk with someone who works there. Learn what they do, and what education and training they received. c. Identify three career opportunities that would use skills and knowledge in chemistry. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.	
Citizenship in the Community	2. Do the following: a. Using an electronic mapping tool or paper map, locate and pinpoint the following services and landmarks in your community. Determine and record the distances from your home including driving time AND either walking or biking time. 1. Chief government buildings such as your city hall, county courthouse, and public works/services facilities 2. Fire station, police station, and hospital nearest your home 3. Parks, playgrounds, recreation areas, and trails 4. Historical or other interesting points of interest.	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 facilities 2. Fire station, police station, and hospital nearest your home 3. Parks, playgrounds, recreation areas, and trails 4. Historical or other interesting points of interest
Citizenship in the Community	3a. Attend an in-person meeting of your city, town, or county council or school board, local court session; OR another state or local governmental meeting approved in advance by your counselor.	3a. Attend a meeting of your city, town, or county council or school board; OR attend a municipal, county, or state court session.
Climbing	3. Present yourself properly dressed for belaying, climbing, and rappelling. Explain why you are wearing each piece of gear and discuss qualities of easy movement, entanglement free and good weather protection and comfort.	3. Present yourself properly dressed for belaying, climbing, and rappelling (i.e., appropriate clothing, footwear, and a helmet; rappellers can also wear gloves).

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Climbing	4d. Determine how to summon aid to the climbing area in case of an emergency. Discuss what medical training is needed for your group when climbing and rappelling in remote areas.	4d. Determine how to summon aid to the climbing area in case of an emergency.
Climbing	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. Prusik knot f. Prusik hitch applied to 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 f. Prussic
Climbing	8. Harness, Helmet & Gloves. Explain the purpose of each of the following and demonstrate how to put them on correctly. a. Commercially made climbing harness or tied harness using webbing b. Climbing helmet c. Climbing or rappelling gloves.	8. Harnesses. Correctly put on a commercially made climbing harness.
Climbing	9. Identify the elements of the CHECK system and describe the meaning of each one to your counselor.	
Climbing	10. Belaying. Do the following: a. Explain the importance of belaying climbers and rappellers and when it is necessary. b. Belay three different climbers on three different routes. c. Serve as a backup belayer on three different climbs. d. Belay three different rappellers on three different routes. e. Serve as a backup belayer on three different rappels.	10. Belaying. Do the following: a. Explain the importance of belaying climbers and rappellers and when it is necessary. b. Belay three different climbers on three different routes. c. Serve as a backup belayer on three different climbs. d. Belay three different rappellers on routes of different heights. e. Serve as a backup belayer on three different rappels.
Climbing	11. Climbing. Do the following: a. Show the correct way to directly tie a belay rope to your harness. b. Climb at least three different routes on a rock face or climbing wall, demonstrating good technique and using verbal signals with a belayer.	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.
Climbing	12. Rappelling. Do the following: a. Show the correct way to directly tie a belay rope to your harness. b. Using a carabiner and a rappel device, attach a rappel rope to your harness. 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.	11. Rappelling. a. Using a carabiner and a rappel device, secure your climbing harness to a rappel rope. b. Tie into 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.
Climbing	13. Demonstrate ways to store rope, hardware, and other gear used for climbing, rappelling, and belaying.	
Cooking	3 Cooking Basics. Do the following: a. Discuss the following cooking methods. For each one, describe the equipment needed, how temperature control is maintained, and name at least one food that can be cooked using that method: baking, boiling, broiling, pan frying, simmering, microwaving, air frying, grilling, foil cooking, Dutch oven.	3a. Discuss EACH of the following cooking methods. For each one, describe the equipment needed, how temperature control is maintained, and name at least one food that can be cooked using that method: baking, boiling, broiling, pan frying, simmering, microwaving, grilling, foil cooking, and use of a Dutch oven.
Cooking	(new) 3d. Explain and give examples of how taste, texture, and smell impact what we eat.	

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Cooking	<p>4. Cooking at Home. Do the following:</p> <p>a. Using the MyPlate food guide or the current USDA nutrition model, plan menus for three full days of meals (three breakfasts, three lunches, and three dinners) plus one dessert. Your menus should include enough to feed yourself and at least one adult, keeping in mind any special needs (such as food allergies) and how you keep your foods safe and free from crosscontamination. List the equipment and utensils needed to prepare and serve these meals.</p> <p>b. Find recipes for each meal. Create a shopping list for your meals showing the amount of food needed to prepare for the number of people you will serve. Determine the cost for each meal.</p> <p>c. Share and discuss your meal plan and shopping list with your counselor.</p> <p>d. Using at least five of the 10 cooking methods from requirement 3, prepare and serve yourself and at least one adult (parent, family member, guardian, or other responsible adult) one breakfast, one lunch, one dinner, and one dessert from the meals you planned. The meals for requirement 4 may be prepared on different days, and they need not be prepared consecutively. Those served need not be the same for all meals.</p> <p>e. Time your cooking to have each meal ready to serve at the proper time. Have an adult verify the preparation of the meal to your counselor.</p> <p>f. After each meal, ask a person you served to evaluate the meal on presentation and taste, then evaluate your own meal. Discuss what you learned with your counselor, including any adjustments that could have improved or enhanced your meals. Tell how planning and preparation help ensure a successful meal.</p>	<p>4. Cooking at home. Using the MyPlate food guide or the current USDA nutrition model, plan menus for three full days of meals (three breakfasts, three lunches, and three dinners) plus one dessert. Your menus should include enough to feed yourself and at least one adult, keeping in mind any special needs (such as food allergies) and how you keep your foods safe and free from crosscontamination. List the equipment and utensils needed to prepare and serve these meals.</p> <p>Then do the following:</p> <p>a. Find recipes for each meal. Create a shopping list for your meals showing the amount of food needed to prepare for the number of people you will serve. Determine the cost for each meal.</p> <p>b. Share and discuss your meal plan and shopping list with your counselor.</p> <p>c. Using at least five of the 10 cooking methods from requirement 3, prepare and serve yourself and at least one adult (parent, family member, guardian, or other responsible adult) one breakfast, one lunch, one dinner, and one dessert from the meals you planned.*</p> <p>d. Time your cooking to have each meal ready to serve at the proper time. Have an adult verify the preparation of the meal to your counselor.</p> <p>e. After each meal, ask a person you served to evaluate the meal on presentation and taste, then evaluate your own meal. Discuss what you learned with your counselor, including any adjustments that could have improved or enhanced your meals. Tell how planning and preparation help ensure a successful meal.</p> <p>*The meals for requirement 4 may be prepared on different days, and they need not be prepared consecutively. The requirement calls for Scouts to plan, prepare, and serve one breakfast, one lunch, and one dinner to at least one adult; those served need not be the same for all meals.*The meals for requirement 4 may be prepared on different days, and they need not be prepared consecutively.</p>
Cooking	<p>5d. In the outdoors, using your menu plans and recipes for this requirement, cook two of the four meals you planned using either a camp stove OR backpacking stove. Use a skillet OR a Dutch oven over campfire coals for the third meal, and cook the fourth meal in a foil pack OR on a skewer. Serve all of these meals to your patrol or a group of youth.</p>	<p>5d. In the outdoors, using your menu plans and recipes for this requirement, cook two of the four meals you planned using either a camp stove OR backpacking stove. Use a skillet over campfire coals OR a Dutch oven for the third meal, and cook the fourth meal in a foil pack OR on a skewer. Serve all of these meals to your patrol or a group of youth.</p>
Cooking	<p>7. Careers and Hobbies. Do ONE of the following:</p> <p>a. Identify three career opportunities that would use skills and knowledge in cooking. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.</p> <p>b. Identify how you might use the skills and knowledge in cooking to pursue a personal hobby or healthy lifestyle. Research the additional training required, expenses, and affiliation with organizations that would help you maximize the enjoyment and benefit you might gain from it. Discuss what you learned with your counselor and share what short-term and long-term goals you might have if you pursued this.</p>	<p>7. Food-related careers. Find out about three career opportunities in cooking. Select 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.</p>
Crime Prevention	<p>1. Laws and Society. Discuss the following with your counselor:</p> <p>a. Why we have criminal laws.</p> <p>b. What are types of crimes, including property crimes, crimes against people, white collar crime, and environmental crime.</p> <p>c. Why people commit crimes.</p> <p>d. Why everyone should follow the law even when no one is watching.</p> <p>e. What is the meaning of crime prevention.</p>	<p>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.”</p>
Crime Prevention	<p>2. Groups Working to Prevent Crime. Research how the following groups contribute to crime prevention and share your findings with your counselor:</p> <p>a. Citizens, including youth</p> <p>b. Schools</p> <p>c. Neighborhood, social and civic groups, including youth groups</p> <p>d. Private security</p> <p>e. Law enforcement agencies</p> <p>f. Courts</p> <p>g. Corrections and rehabilitation programs.</p>	<p>2. Prepare a journal from various sources that address crime and crime prevention efforts in your community.</p>

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Crime Prevention	<p>3. Crime in Your Community, State, and Nation. Do the following:</p> <p>a. With your parent or guardian's permission and the approval of your counselor, research local, state, or national news coverage of three crimes of different types. Research how common these types of crimes are in your state or in the United States.</p> <p>b. Record notes on which law enforcement agencies and courts were involved in the pursuit of justice for the victims and the accused person, why you think these crimes were committed, and what could be done to prevent similar crimes. Review your research with your counselor.</p>	<p>3. Discuss the following with your counselor:</p> <p>a. The role of citizens, including youth, in crime prevention.</p> <p>b. Gangs and their impact on the community.</p> <p>c. When and how to report a crime.</p>
Crime Prevention	<p>4. Home and Neighborhood Crime Prevention. Do the following:</p> <p>a. Discuss the following with your counselor:</p> <p>1. How participation in activities of families, churches, sports teams, and clubs prevents crime.</p> <p>2. How designs of houses, neighborhoods, public buildings, stores, streets, and parks prevent crime.</p> <p>b. Conduct a security survey of a home, a neighborhood, a park, or a camp building with adult supervision and following youth protection guidelines using a security checklist in the pamphlet or one approved by your counselor.</p> <p>c. Use information from your survey for requirement 4b and the EDGE method to develop a lesson about how a family or Scouts can protect themselves from crime. Review your teaching plan with your counselor, then present your lesson to your family or to Scouts.</p>	<p>4. After doing EACH of the following, discuss with your counselor what you have learned.</p> <p>a. Inspect your neighborhood for opportunities that may lead to crime. Learn how to do a crime prevention survey.</p> <p>b. Using the checklist in this pamphlet, conduct a security survey of your home and discuss the results with your family.</p>
Crime Prevention	<p>5. Retail Crime Prevention. Research the following topics and review them with your counselor:</p> <p>a. The impact of shoplifting and employee theft (also known as shrinkage) and loss prevention on retail finances, customer service, and reputation.</p> <p>b. Techniques used by retail stores to prevent shoplifting.</p>	<p>5. Teach your family or patrol members how to protect themselves from crime at home, at school, in your community, and while traveling.</p>
Crime Prevention	<p>6. Reporting Crime. Discuss the following with your counselor:</p> <p>a. When and how to report a crime or an impending crime.</p> <p>b. The warning signs for child abuse and domestic violence and how to report these situations.</p> <p>c. How to resist peer influence.</p> <p>d. The three R's of personal safety and protection and how to apply them.</p> <p>e. How reporting a crime can help law enforcement provide resources for crime victims.</p>	<p>6. Help raise awareness about one school safety issue facing students by doing ONE of the following:</p> <p>a. Create a poster for display on a school bulletin board.</p> <p>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 website.</p> <p>c. Make a presentation to a group such as a Cub Scout den that addresses the issue.</p>
Crime Prevention	<p>7. Peers and Crime. Discuss the following with your counselor:</p> <p>a. The role that peers play in crime, crime prevention, and experiencing crime.</p> <p>b. How to resist peer influence.</p> <p>c. Bullying and hazing behaviors and signs that a friend may be bullying you or someone else.</p> <p>d. Explain the impact of gangs on communities.</p>	<p>7. Do ONE of the following:</p> <p>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.</p> <p>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.</p>
Crime Prevention	<p>8. Substance Use and Crime. Discuss the following with your counselor:</p> <p>a. The legal and health consequences of using alcohol, tobacco and vaping products, illegal drugs, and diverted prescription drugs.</p> <p>b. How substance use contributes to violence and property crime and increases a person's risk of becoming a victim of crime.</p> <p>c. How drug abuse awareness, prevention, and recovery programs help prevent crime.</p> <p>d. How to get help if you or someone you know needs help with drugs or alcohol.</p>	<p>8. Discuss the following with your counselor:</p> <p>a. How drug abuse awareness programs help prevent crime.</p> <p>b. Why alcohol, tobacco, and marijuana are sometimes called "gateway drugs" and how gateway drugs can lead to the use of other drugs.</p> <p>c. The potential consequences from the misuse of prescription drugs.</p> <p>d. How the illegal sale and use of drugs lead to other crimes.</p> <p>e. Three resources in your city where a person with a drug problem or drug-related problem can go for help.</p> <p>f. How to recognize child abuse.</p> <p>g. The three R's of Youth Protection.</p>
Crime Prevention	<p>9. Online Crime and You. Discuss the following with your counselor:</p> <p>a. How to avoid being the victim of online crimes.</p> <p>b. Common online financial scams.</p> <p>c. Effective online security.</p> <p>d. Identity theft and how to prevent it.</p> <p>e. How criminals use social media to target victims.</p> <p>f. How bullying, texting, and sharing photos can become crimes.</p>	<p>9. Discuss the following with your counselor:</p> <p>a. The role of a sheriff's or police department in crime prevention.</p> <p>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.</p> <p>c. Explain the role private security plays in crime prevention.</p> <p>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.</p>
Crime Prevention	<p>10. Interview a law enforcement officer or a civil servant about their work in crime prevention. Learn about how they chose this career and about their duties. Discuss what you learned with your counselor.</p>	
Crime Prevention	<p>11. Identify three career opportunities that would use skills and knowledge in the field of crime prevention. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.</p>	

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Cycling	1b. Show that you know first aid for injuries or illnesses that could occur while cycling, including cuts, scratches, concussions, blisters, sunburn, heat exhaustion, heatstroke, hypothermia, frostbite, dehydration, insect stings, tick bites, and snakebite. Explain to your counselor why you should be able to identify the poisonous plants and poisonous animals that are found in your area.	1b. Show that you know first aid for injuries or illnesses that could occur while cycling, including cuts, scratches, blisters, sunburn, heat exhaustion, heatstroke, hypothermia, frostbite, dehydration, insect stings, tick bites, and snakebite. Explain to your counselor why you should be able to identify the poisonous plants and poisonous animals that are found in your area.
Cycling	3. Explain the importance of wearing the right clothing and gear while cycling, including a properly sized and fitted helmet. Know the Scouting America Bike Safety Guidelines.	3. Explain the importance of wearing a properly sized and fitted helmet while cycling, and of wearing the right clothing for the weather. Know the BSA Bike Safety Guidelines.
Cycling	6. Using the Scouting America buddy system, complete all of the requirements for ONE of the following options: Road Biking OR Trail or Mixed Surface Biking. These requirements may be completed using a road bike, mountain bike or other properly equipped, manually-powered cycle such as a gravel bike, tandem bike, hand-powered bike, recumbent bike, adult tricycle, or adaptive cycle. If a tandem bike is used, the Scout must actively power the cycle in concert with the other rider.	6. Using the BSA buddy system, complete all of the requirements for ONE of the following options: road biking OR mountain biking.
Cycling	6 Option A a. Take a road safety test with your counselor and demonstrate the following:	6 Option A a. Take a road test with your counselor and demonstrate the following:
Cycling	6 Option B b. Take a trail safety test with your counselor and demonstrate the following:	6 Option B b. Take a trail ride with your counselor and demonstrate the following:
Cycling	6 Option B d. On mountain biking or multi-use trails approved by your counselor, take two rides of 2 miles each, two rides of 5 miles each, and two rides of 8 miles each. You must make a report of the rides taken. List dates for the routes traveled, and interesting things seen.	6 Option B d. On trails approved by your counselor, take two rides of 2 miles each, two rides of 5 miles each, and two rides of 8 miles each. You must make a report of the rides taken. List dates for the routes traveled, and interesting things seen.
Cycling	6 Option B e. After fulfilling the previous requirement, lay out on a trail map a 22-mile trip. You may include multiple trail systems, if needed. Stay away from main highways. Using your map, complete this ride in one day.	6 Option B e. After fulfilling the previous requirement, lay out on a trail map a 22-mile trip. You may include multiple trail systems, if needed. Stay away from main highways. Using your map, make this ride in six hours.
Cycling	6 Option B. Trail or Mixed Surface Biking	6 Option B. Mountain Biking
Cycling	(delete this footnote)	Footnote to #6 *The bicycle used for fulfilling these requirements must have all required safety features and must be registered as required by your local traffic laws.
Dentistry	1. Using x-ray (radiographic) films or images and with your counselor's guidance, do the following: a. Study the tooth structure and look for decay. b. Draw a lower molar, using the radiographs as a guide. Label its parts and surfaces. Show surrounding structures such as bone and gum tissues. c. Show on your drawing where the nerves and blood vessels enter and leave the tooth. d. Show on your drawing where bacterial plaque is most likely to be found.	1. Using x-ray (radiographic) films and with your counselor's guidance, study the tooth structure and look for decay. Then do the following: a. Using the radiographs as a guide, draw a lower molar. Label its parts and surfaces. Show surrounding structures such as bone and gum tissues. b. Show on your drawing where the nerves and blood vessels enter and leave the tooth. c. Show on your drawing where bacterial plaque is most likely to be found.
Dentistry	7. Identify three career opportunities that would use skills and knowledge in dentistry. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.	7. Learn about career opportunities for both Doctor of Dental Surgery (D.D.S.) and auxiliary dental professions. Pick either general dentistry OR a dental specialty, plus one auxiliary dental profession. Find out about the education, training, and experience required for these two professions. Discuss these with your counselor, and explain why these professions interest you.
Digital Technology	8b. Explain to your counselor why it is important to use a certified recycler of digital technology hardware or devices.	8b. Explain to your counselor what is required to become a certified recycler of digital technology hardware or devices.
Digital Technology	9a. Identify three career opportunities that involve digital technology. Pick one and investigate the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.	9a. Investigate three career opportunities that involve digital technology. 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.
Dog Care	10. Do ONE of the following: a. Identify three career opportunities that would use skills and knowledge in working with dogs. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career. b. Identify how you might use the skills and knowledge in working with dogs to pursue a personal hobby and/or healthy lifestyle. Research the additional training required, expenses, and affiliation with organizations that would help you maximize the enjoyment and benefit you might gain from it. Discuss what you learned with your counselor and share what short-term and long-term goals you might have if you pursued this.	10. Learn about three career opportunities for working with dogs. Pick one and find out about the education, training, and experience required for this career, and discuss this with your counselor. Tell why this profession interests you.

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Drafting	<p>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:</p> <p>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 sectional drawings, notes, and considerations necessary for construction. Properly print a bill of materials for at least three of the raw materials or components in the project.</p> <p>b. Mechanical: Make a scale drawing of some mechanical device or interesting object. The mechanical drawing may be of the orthographic (third-angle) or isometric style. Use an engineer's scale and show dimensions to communicate the actual size of features. Include any important sectional drawings, notes, and manufacturing considerations. Properly print a bill of materials for at least three of the raw materials or components in the assembly.</p> <p>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.</p>	<p>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:</p> <p>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 sectional drawings, notes, and considerations necessary for construction.</p> <p>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 sectional drawings, notes, and manufacturing considerations. Properly print a bill of materials for the raw material or components in the assembly.</p> <p>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.</p>
Drafting	<p>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:</p> <p>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 sectional drawings, notes, and considerations necessary for construction.</p> <p>b. Mechanical: Make a scale drawing of some mechanical device or interesting object. The mechanical drawing may be of the orthographic (third-angle) or isometric style. Use an engineer's scale and show dimensions to communicate the actual size of features. Include any important sectional drawings, notes, and manufacturing considerations.</p> <p>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.</p>	<p>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:</p> <p>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 sectional drawings, notes, and considerations necessary for construction.</p> <p>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 sectional drawings, notes, and manufacturing considerations.</p> <p>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.</p>
Drafting	<p>(new) 4. Do the following:</p> <p>a. Present a copy of your drawings from Requirements 2 and 3, either in paper or digital format to your counselor. Your counselor will return a redlined version of your drawings indicating to add/remove/change a feature, material, BOM QTY, etc.</p> <p>b. Make the correction from the redline, identify it on the drawings with a revision marker, and add a revision block.</p>	New requirement. Minor renumbering and wording of subsequent requirements as noted.
Drafting	<p>5. Discuss with your counselor how fulfilling requirements 2, 3 and 4 differed from each other. Tell about the benefits derived from using CAD for requirements 3 and 4. Include in your discussion the software you used as well as other software options that are available.</p>	<p>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.</p>
Drafting	<p>6. 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 through 5 to support your opinion. Use the formatted sheet of paper you prepared in requirement 1 for your lettering project.</p>	<p>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.</p>
Drafting	<p>Renumber current #6 to #7</p>	
Drafting	<p>8. Identify three career opportunities that would use skills and knowledge in Drafting. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.</p>	<p>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.</p>
Electricity	<p>1. Demonstrate that you know how to respond to electrical emergencies by doing the following:</p> <p>a. Explain how to turn off power for a particular circuit and the whole house in the event of an emergency.</p> <p>b. Demonstrate how to rescue a person touching a live wire in the home.</p> <p>c. Describe how to safely get out of a car in an accident if you suspect a utility wire is on the car.</p> <p>d. Show how to render first aid to a person who is unconscious from an apparent electrical shock.</p> <p>e. Show how to treat an electrical burn.</p> <p>f. Explain what to do in the event of an electrical fire.</p> <p>g. Explain what to do if caught out in the open during an electrical storm.</p>	<p>1. Demonstrate that you know how to respond to electrical emergencies by doing the following:</p> <p>a. Show how to rescue a person touching a live wire in the home.</p> <p>b. Show how to render first aid to a person who is unconscious from electrical shock.</p> <p>c. Show how to treat an electrical burn.</p> <p>e. Explain what to do in the event of an electrical fire.</p> <p>d. Explain what to do in an electrical storm.</p>
Electricity	<p>4. Do the following:</p> <p>a. Explain the difference between direct current and alternating current, the advantages and disadvantages of each, and give a practical example of the use of each type.</p> <p>b. Explain three ways that electricity is produced.</p>	<p>4. Explain the difference between direct current and alternating current.</p>
Electricity	<p>5. Make a simple drawing to show how a battery and an electric bell work. Describe the purpose of each of the components.</p>	<p>5. Make a simple drawing to show how a battery and an electric bell work.</p>

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Electricity	6. Do the following: a. Define what overloading an electric circuit means. Tell what you have done to make sure your home circuits are not overloaded. b. Determine if there is an overload on a branch circuit by either getting the current draw from all the equipment plugged into the circuit or use the power equation to calculate the current draws. c. Explain why a fuse blows and a circuit breaker trips. d. Tell how to find a blown fuse and a 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. 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
Electricity	7. Make a floor plan wiring diagram of the lights, switches, and outlets for a room in your home. Show which fuse or circuit breaker protects each one.	8. Make a floor plan wiring diagram of the lights, switches, and outlets for a room in your home. Show which fuse or circuit breaker protects each one.
Electricity	8. Do the following: a. Read a meter associated with an electric bill. Determine the total power used since the bill, and the cost of that power. b. Explain other charges on the bill that were taxes or fees. c. Discuss with your counselor five ways in which your family can conserve energy.	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.
Electricity	9. Explain the following: a. Electrical terms - Current, energy, power, resistance, voltage b. Units of measure - Ampere (amps), ohms, volts, watts, watt-hours c. Electrical conditions - Generating source with example, ground, open circuit, overvoltage, potential difference, short circuit d. Equipment and their use - circuit, conductor, Ground Fault Circuit Interrupter (GFCI), insulator, inverter, rectifier, rheostat, substation, surge protection, solar panel, transformer, transmission and distribution systems, wind turbine.	10. Explain the following electrical terms: volt, ampere, watt, ohm, resistance, potential difference, rectifier, rheostat, conductor, ground, GFCI, circuit, and short circuit.
Electricity	10. Do 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 (from a kit is acceptable, if approved by your counselor ahead of time). c. Build a simple rheostat. Show that it works. d. Build a single-pole, double-throw switch. Show that it works. e. Explain how 3-way switch wiring works in a lighting circuit. f. Connect two lights together in a series circuit along with a battery and a switch. Then connect the same circuit in parallel. Discuss the differences in the two circuits.	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.
Electricity	11. Identify three career opportunities that would use skills and knowledge in electricity. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.	
Electronics	4. Do the following: a. Discuss each of the following with your counselor: 1. How to use electronics for a control purpose. 2. Explain the basic principles of digital logic. 3. How to use electronics for three different analog applications. b. Show how to change three decimal numbers into binary numbers and three binary numbers into decimal numbers. c. Choose ONE of the following THREE projects. For your project, find or create a schematic diagram. To the best of your ability, explain to your counselor how the circuit you built operates. 1. Control device 2. Digital circuit 3. Analog circuit.	4. Do the following: a. Discuss each of the following with your merit badge counselor: i. How to use electronics for a control purpose ii. The basic principles of digital techniques iii. How to use electronics for three different audio applications b. Show how to change three decimal numbers into binary numbers and three binary numbers into decimal numbers. c. Choose ONE of the following three projects. For your project, find or create a schematic diagram. To the best of your ability, explain to your counselor how the circuit you built operates. i. A control device ii. A digital circuit iii. An audio circuit
Electronics	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. c. Demonstrate to your counselor how to read the colored bands of a resistor to determine its resistance value. d. Explain the differences between Through Hole and Surface Mount assembly technologies and give three advantages of each.	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. c. Demonstrate to your counselor how to read the colored bands of a resistor to determine its resistance value.
Electronics	6. Identify three career opportunities that would use skills and knowledge in Electronics. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.	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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MERIT BADGE	UPDATED REQUIREMENT	ORIGINAL REQUIREMENT
Emergency Preparedness	<p>2. Emergency Situations. Do the following:</p> <p>a. Discuss with your counselor the aspects of emergency preparedness and include in your discussion the kinds of questions that are important to ask yourself as you consider each of these:</p> <ol style="list-style-type: none"> 1. Prevention 2. Protection 3. Mitigation 4. Response 5. Recovery. <p>b. Using a chart, spreadsheet, or another method approved by your counselor, demonstrate your understanding of each aspect of emergency preparedness listed in requirement 2(a) (prevention, protection, mitigation, response, and recovery) for 10 emergency situations from the list below. Discuss your findings with your counselor.</p> <ol style="list-style-type: none"> 1. Home stovetop or oven fire 2. Home flammable liquid fire 3. Gas leak in or near a home or with outside cooking 4. Food poisoning 5. Automobile crash 6. Vehicle stalled in the desert 7. Vehicle trapped in a blizzard 8. Backcountry injury 9. Boating or water accident 10. Toxic chemical spills and releases 11. Nuclear power plant emergency 12. Fire or explosion in a public place 13. Violence in a public place 14. Wildland fire 15. Avalanche (snowslide or rockslide) 16. Earthquake 17. Tsunami 18. Major flooding or a flash flood with water outage 19. Hurricane with power outage 20. Tornado 21. Lightning storm. 	<p>2. Do the following:</p> <p>a. Discuss with your counselor the aspects of emergency preparedness:</p> <ol style="list-style-type: none"> 1. Prevention 2. Protection 3. Mitigation 4. Response 5. Recovery <p>Include in your discussion the kinds of questions that are important to ask yourself as you consider each of these.</p> <p>a. Using a chart, graph, spreadsheet, or another method approved by your counselor, demonstrate your understanding of each aspect of emergency preparedness listed in requirement 2a (prevention, protection, mitigation, response, and recovery) for 10 emergency situations from the list below. You must use the first five situations listed below in boldface, plus any other five of your choice. Discuss your findings with your counselor.</p> <ol style="list-style-type: none"> 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 9. Earthquake or tsunami 10. Mountain/backcountry accident 11. Boating or water accident 12. Gas leak in a home or a building 13. Tornado or hurricane 14. Major flooding or a flash flood 15. Toxic chemical spills and releases 16. Nuclear power plant emergency 17. Avalanche (snowslide or rockslide) 18. Violence in a public place <p>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.</p>
Emergency Preparedness	<p>3. Planning for Family Emergencies. Do the following:</p> <p>a. At a family meeting, discuss the situations on the chart you created for requirement 2b and make emergency plans for sheltering-in-place and for evacuation of your home. Discuss your family meeting and plans with your counselor.</p> <p>b. Develop and practice a plan of escape for your family in case of fire in your home. Draw a floor plan with escape routes and a map with a safe meeting place. Discuss your family's home escape plan with your counselor.</p> <p>c. Using a checklist in the Emergency Preparedness Merit Badge pamphlet or one approved by your counselor, prepare or inspect a family disaster kit for sheltering-in-place and for evacuation of your home. Review the needs and uses of the items in a kit with your counselor.</p>	<p>3. Show how you could save a person from the following dangerous situations without putting yourself in danger:</p> <ol style="list-style-type: none"> a. Touching a live household electric wire b. A structure filled with carbon monoxide c. Clothes on fire d. Drowning, using nonswimming rescues (including accidents on ice)
Emergency Preparedness	<p>4. Preventing Accidents and Emergencies. Do ONE of the following:</p> <p>a. Using a home safety checklist included in the Emergency Preparedness Merit Badge pamphlet or one approved by your counselor, inspect a home (or a similar building near where you live or at a camp) for safety hazards with the help of an adult. Present your completed checklist to and discuss your findings with your counselor.</p> <p>b. Develop emergency prevention plans for five family activities outside the home, as approved by your counselor. (Examples are taking a picnic to a park, seeing a movie, attending a worship service, an outing at a beach, traveling to visit a relative, or attending a ball game or concert.) Each plan should include an analysis of possible hazards, proposals to prevent, protect from, mitigate, respond to, and recover from emergencies, and the reasons for the actions that you propose.</p>	<p>4. Show three ways of attracting and communicating with rescue planes/aircraft.</p>

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Emergency Preparedness	<p>5. Dangerous Situations. Show how you could save a person from the following dangerous situations without putting yourself in danger:</p> <ol style="list-style-type: none"> Live household electric wire A structure filled with carbon monoxide Clothes on fire Drowning, using nonswimming rescues (including accidents on ice). 	<p>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.</p>
Emergency Preparedness	<p>6. Signaling for Help. Do the following:</p> <ol style="list-style-type: none"> Show three ways of attracting and communicating with rescue aircraft or drones. Show ways to attract attention of searchers on the ground if you are lost in the wilderness. Show ways to attract attention of searchers on the water if you are stranded with a capsized or disabled motorboat or sailboat. 	<p>6. Do the following:</p> <ol style="list-style-type: none"> Describe the National Incident Management System (NIMS)/Incident and the Incident Command System (ICS). Identify the local government or community agencies that normally handle and prepare for emergency services similar to those of the NIMS or ICS. Explain to your counselor ONE of the following: <ol style="list-style-type: none"> How the NIMS/ICS can assist a Scout troop when responding in a disaster How a group of Scouts could volunteer to help in the event of these types of emergencies Find out who is your community's emergency management director and learn what this person does to prevent, protect, mitigate, respond to, and recover from emergency situations in your community. Discuss this information with your counselor, utilizing the information you learned from requirement 2b.
Emergency Preparedness	<p>7. Moving an Injured Person. With another person, show two good ways to transport an injured person out of a remote area using improvised stretchers to conserve the energy of rescuers while ensuring the well-being and protection of the injured person.</p>	<p>7. Do the following:</p> <ol style="list-style-type: none"> Take part in an emergency service project, either a real one or a practice drill, with a Scouting unit or a community agency. 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.
Emergency Preparedness	<p>8. National Incident Management System (NIMS) and Incident Command System (ICS). Do the following:</p> <ol style="list-style-type: none"> Describe the National Incident Management System (NIMS) and the local Incident Command System (ICS). Find out how your community and its leaders work to manage and to train for disasters. Discuss this information with your counselor, using the information you learned from requirement 1b. Discuss how a Scout troop can help in an emergency situation using ICS. 	<p>8. Do the following:</p> <ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> Crowd and traffic control Messenger service and communication Collection and distribution services Group feeding, shelter, and sanitation 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.
Emergency Preparedness	<p>9. Emergency Service. Do the following:</p> <ol style="list-style-type: none"> Discuss with your counselor the duties that a Scout troop should be prepared to do, the training they need, and the safety precautions they should take for the following emergency services: <ol style="list-style-type: none"> Crowd and traffic control Messenger service during an incident Collection and distribution services Group feeding, shelter, and sanitation. Prepare a written plan for mobilizing your troop when needed to do emergency service. If your troop already has a mobilization plan, present the plan to your counselor and tell your part in making the plan work. Using a checklist in this pamphlet or one approved by your counselor, prepare or inspect a personal emergency service pack for a mobilization call. Explain the needs and uses of the contents to your counselor. Take part in an emergency service project, either a real one or a practice exercise, with a Scouting troop or a community agency or at Scout camp or at a school. Review what you learned and practiced with your counselor. 	<p>9. Do ONE of the following:</p> <ol style="list-style-type: none"> 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. Review or develop a plan of escape for your family in case of fire in your home. 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.
Emergency Preparedness	<p>10. Do ONE of the following:</p> <ol style="list-style-type: none"> Interview an emergency services coordinator or a civil servant about their work in disaster management. Learn about how they chose this career and about their duties. Discuss what you learned with your counselor and whether you might be interested in this career. Identify three career opportunities that would use skills and knowledge in emergency services. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities, and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career. Identify how you might use the skills and knowledge in the field of emergency preparedness to pursue a personal hobby and/or healthy lifestyle. Research the additional training required, expenses, and affiliation with organizations that would help you maximize the enjoyment and benefit you might gain from it. Discuss what you learned with your counselor and share what short-term and long-term goals you might have if you pursued this. 	

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Energy	2a. Explain how THREE of the following devices use energy, and explain their energy conversions: toaster, greenhouse, lightbulb, bow drill, cell phone, nuclear reactor, sauna, electric vehicles.	2a. Explain how THREE of the following devices use energy, and explain their energy conversions: toaster, greenhouse, lightbulb, bow drill, cell phone, nuclear reactor, sweat lodge.
Energy	8. Identify three career opportunities that would use skills and knowledge in energy. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities, and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.	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.
Environmental Science	1. Describe the meaning of environmental science in your own words. Explain how you think we can use science to understand, conserve, and improve our environment.	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.
Environmental Science	2. Ecology. Do the following and discuss with your counselor: a. Choose an area approved by your counselor and observe (sight, sound, and smell) its ecosystem over a two-day period. b. Make notes about the living, nonliving (e.g. rocks) and formerly living components. Include information about interactions among the components, including the food chain, predators, native species, and invasive species) and identify how human activities have affected the ecosystem.	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.
Environmental Science	3. Air Pollution. Do ONE of the following and discuss with your counselor: a. Learn what Particulate Matter (PM) is, how PM gets into the air, what the harmful effects of PM are, and what is being done to reduce PM in the air. Then, perform an experiment to test for particulates that contribute to air pollution. b. Discuss how air pollution and transportation affect each other by giving at least three examples. Then, compare two modes of transportation (e.g., gasoline-powered v. electric vehicles, gasoline-powered car v. bicycle, etc.). c. Learn about the Clean Air Act. Make notes on when it was passed, its environmental goals, what progress has been made and what remains to be done to achieve the law's goals. Describe the impact, benefits, and costs of the law as well as what is required to implement and enforce the law.	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.
Environmental Science	4. Water Pollution. Do ONE of the following and discuss with your counselor: a. Identify where your community sources water, how it is treated, and disposed. Obtain and review a water quality report from your area. b. Identify a local or regional area that experiences periodic flooding and/or drought. Collect facts on prior event(s) and investigate the environmental impacts of these extreme events. c. Learn about the Clean Water Act. Make notes on when it was passed, its environmental goals, what progress has been made and what remains to be done to achieve the law's goals. Describe the impact, benefits, and costs of the law as well as what is required to implement and enforce the law.	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.
Environmental Science	5. Land Pollution. Do ONE of the following and discuss with your counselor: a. In an area (yard, park, golf course, farm, etc.) approved by your counselor, make a list of the pesticides, herbicides, and fertilizers used and how often they are applied. Identify the benefits of their use and the environmental impact, including effects on non-target species (including humans), what happens if the chemicals infiltrate into the groundwater, and what happens to any runoff of the chemicals. b. Learn about the erosion process and identify an example of where erosion occurs. Determine where the eroded material ends up and how erosion can be minimized. c. Learn about a land pollution incident that led to a site being listed on Environmental Protection Agency's Superfund National Priority List. Identify what caused the incident, what the effects were on the environment, what remediation has been done, and the current condition of the site.	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.
Environmental Science	6. Rare, Threatened, or Endangered Species. Do ONE of the following and discuss with your counselor: a. Do research on one endangered species found in your state. Learn about its natural habitat, why it is endangered, what is being done to preserve it, and how many individual species are left in the wild. Prepare a 100-word report about the species and include a drawing or photo. Present your report to your patrol or troop. b. Do research on one species that was endangered or threatened but that has now recovered. Learn about how the species recovered, and what its new status is. Prepare a 100-word report on the species and include a drawing or photo. Present your report to your patrol or troop. c. With your parent or guardian and counselor's approval, work with a natural resource professional to identify a completed project that has been designed to improve the habitat for a threatened or endangered species in your area. Visit the site and report on what you saw to your patrol or troop.	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 that 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.

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Environmental Science	<p>7. Pollution Prevention, Resource Recovery, and Conservation. Do ONE of the following and discuss with your counselor:</p> <p>a. Determine five ways to conserve resources or use resources more efficiently in your home, school, or camp. Practice at least two of these methods for at least one week.</p> <p>b. Explain Resource Recovery and why it is important to reduce pollution. Collect samples or take photos of ten items that can demonstrate the principle of Reduce, Reuse, Recycle. Explain your collection, how these materials are currently handled, and potential improvements.</p> <p>c. Identify five items in your household that will become hazardous waste. Explain how they should be properly stored, what special care is needed for disposal, and proper disposal options available in your area.</p>	<p>F. Pollution Prevention, Resource Recovery, and Conservation</p> <p>(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.</p> <p>(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.</p> <p>(3) Perform an experiment on packaging materials to find out which ones are biodegradable. Discuss your conclusion with your counselor.</p>
Environmental Science	<p>8. Pollination. Do ONE of the following and discuss with your counselor:</p> <p>a. Investigate pollination and its importance to our environment and ecosystems. Make a list of five pollinators and the plants that attract them in your region. Explain the importance of pollinators and what Scouts can do to support pollinators in their area.</p> <p>b. Visit an area with flowering plants during pollination season for an hour to observe pollination. Record which pollinators are attracted to which plant. Explain the importance of pollinators and what Scouts can do to support pollinators in their area.</p> <p>c. Learn about the importance of pollination to agriculture, including the economic costs and benefits. Identify four crop-pollinator pairs. Explain the relationship of pollinators to agriculture.</p>	<p>G. Pollination</p> <p>(1) Using photographs or illustrations, point out the differences between a drone and a worker bee. Discuss the stages of bee development (eggs, larvae, pupae). Explain the pollination process, and what propolis is and how it is used by honey bees. Tell how bees make honey and beeswax, and how both are harvested. Explain the part played in the life of the hive by the queen, the drones, and the workers.</p> <p>(2) Present to your counselor a one-page report on how and why honey bees are used in pollinating food crops. In your report, discuss the problems faced by the bee population today, and the impact to humanity if there were no pollinators. Share your report with your troop or patrol, your class at school, or another group approved by your counselor.</p> <p>(3) Hive a swarm OR divide at least one colony of honey bees. Explain how a hive is constructed.</p>
Environmental Science	<p>9. Invasive Species. In your community or camp, investigate two invasive plant or animal species. Learn where the species originated, how they were transported to this ecosystem, their life history, how they are spread, how they impact the native ecosystem, and the recommended means to eradicate or control their spread. Discuss what you learned with your counselor.</p>	<p>H. Invasive Species</p> <p>(1) Learn to identify the major invasive plant species in your community or camp and explain to your counselor what can be done to either eradicate or control their spread.</p> <p>(2) Do research on two invasive plant or animal species in your community or camp. Find out where the species originated, how they were transported to the United States, their life history, how they are spread, and the recommended means to eradicate or control their spread. Report your research orally or in writing to your counselor.</p> <p>(3) Take part in a project of at least one hour to eradicate or control the spread of an invasive plant species in your community or camp.</p>
Environmental Science	<p>10. Identify the environmental impact topics that would need to be addressed for a construction project such as building a house, adding a new building to your Scout camp, or one you create on your own that is approved by your counselor. Evaluate the purpose and benefit of the proposed project, alternatives (including a no-action alternative), and any environmental consequences. Discuss with your counselor.</p>	<p>5. Identify the items that would need to be included in an environmental impact statement for a construction project such as building a house, adding a new building to your Scout camp, or one you create on your own that is approved by your counselor.</p>
Environmental Science	<p>11. Identify three career opportunities that would use skills and knowledge in the environmental science field. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.</p>	<p>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.</p>
Family Life	<p>4. With the approval of your parent or guardian and your counselor, decide on and carry out an individual project that you would do around the home that would benefit your family. After completion, discuss the objective or goal and the results of the project with your family and then your counselor.</p>	<p>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.</p>
Family Life	<p>6b2. The greatest dangers and addictions facing youth in today's society (examples include mental health challenges, use of tobacco products, alcohol, or drugs and other items such as debts, social media, etc.)</p>	<p>6b2. The greatest dangers and addictions facing youth in today's society (examples include use of tobacco products, alcohol, or drugs and other items such as debts, social media, etc.)</p>
Family Life	<p>6b3. The growing-up process and how the body changes, and making responsible decisions dealing with sex. This conversation may take place with only one parent or guardian.</p>	<p>6b3. Understanding the growing-up process and how the body changes, and making responsible decisions dealing with sex[‡] [‡]This conversation may take place with only one or both of your parents or guardians.</p>
Family Life	<p>6b5. A crisis situation within your family and who you can turn to for support during these situations.</p>	<p>6b5. A crisis situation within your family</p>
Fingerprinting	<p>2. Do the following:</p> <p>a. Explain the difference between the automated fingerprint identification systems (AFIS) now used by law enforcement agencies and the biometric fingerprint systems used to control access to computers and places like buildings and airports.</p> <p>b. Discuss how our society uses identification systems based on tokens, passwords, and biometrics.</p>	<p>2. Explain the difference between the automated fingerprint identification systems (AFIS) now used by law enforcement agencies and the biometric fingerprint systems used to control access to computers and places like buildings and airports.</p>
Fingerprinting	<p>(new) 6. Identify three career opportunities that would use skills and knowledge in the areas of biometrics and/or fingerprinting. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities, and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.</p>	

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MERIT BADGE	UPDATED REQUIREMENT	ORIGINAL REQUIREMENT
Fire Safety	<p>1. Science of and Hazards of Fire. Do the following:</p> <ul style="list-style-type: none"> a. Explain the concept of fire. b. Name the parts of the fire tetrahedron and the products of combustion. c. Describe the life cycle of a fire. d. Explain the three methods of heat transfer. 	<p>1. Do the following:</p> <ul style="list-style-type: none"> a. Demonstrate the technique of stop, drop, cover, roll, cover your face, and cool. Explain how burn injuries can be prevented. b. List the most frequent causes of burn injuries. c. Explain how to safely store flammable and combustible liquids. Describe the options available for safely disposing of unwanted hazardous substances in your community.
Fire Safety	<p>2. Fire Extinguishers. Do the following:</p> <ul style="list-style-type: none"> a. Explain the different classes of fires. b. Identify the different classes of fire extinguishers and which should be used for each class of fire. c. Demonstrate how to use a fire extinguisher and a fire blanket. 	<p>2. Explain the concept of fire and name the parts of the fire tetrahedron. Name the by-products of combustion. Describe the life cycle of a fire.</p>
Fire Safety	<p>3. Fire-related Injuries. Do the following:</p> <ul style="list-style-type: none"> a. Explain and demonstrate the technique of stop, drop, roll, cool, and call. b. Describe how clothing fires occur, how to prevent them, and how clothing can prevent or contribute to burn injuries. c. Identify the most frequent causes of burn injuries and how to prevent them. d. Review the prevention of, symptoms and signs of, and treatment of airway burns and carbon monoxide (CO) poisoning. 	<p>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.</p>
Fire Safety	<p>4. Origins of Fires. Do the following:</p> <ul style="list-style-type: none"> a. Explain the four classifications of fire origin (natural, accidental, incendiary, or undetermined) and give an example of each. b. Describe how a fire classified as incendiary might lead to criminal prosecution of a person charged with arson. 	<p>4. Do the following:</p> <ul style="list-style-type: none"> a. Explain the four classifications of fire origin (accidental, natural, incendiary, or undetermined) and give an example of each. b. Describe how a fire classified as incendiary might lead to criminal prosecution of a person charged with arson. c. Explain some of the social, economic and environmental consequences that result from incendiary fires that damage or destroy structures and wildlands.
Fire Safety	<p>5. Fire Safety at Home. Do the following:</p> <ul style="list-style-type: none"> a. Describe how to prevent the frequent causes of home fires, including unattended cooking, electricity, smoking, clothes dryers, and rechargeable batteries. b. Describe how to prevent frequent causes of seasonal and holiday-related home fires, including fires related to home heating, holiday trees, candles, and fireworks. c. Demonstrate how to safely light and extinguish a candle. Discuss with your counselor, then with your family, how to safely use candles. d. Using the Home Fire Safety Checklist in this pamphlet or one approved by your counselor, and with the help of an adult, inspect a home (or a similar building near where you live or at a camp) for fire safety hazards. Present your completed checklist to your counselor and discuss your findings. e. Determine if, and what types of, smoke and CO alarms are required in homes in your community. List what types of smoke and CO alarms your home has, their locations, and their expiration dates. f. Demonstrate maintenance of smoke and CO alarms to your counselor and review plans to replace expired alarms. g. Develop a home fire-escape plan and a fire-drill schedule with your family, draw a floor plan of your home with exits marked and a map showing your family meeting point, and conduct a home fire drill. h. Explain what to do and what not to do if you smell natural gas and if you smell smoke. i. Explain how you would report a fire to have the fire department respond. 	<p>5. List the actions and common circumstances that cause seasonal and holiday-related fires. Explain how these fires can be prevented.</p>
Fire Safety	<p>6. Safety with Flammable and Combustible Liquids. Do the following:</p> <ul style="list-style-type: none"> a. Explain what flammable and combustible liquids are commonly used in homes and how to safely store them. b. Describe the safe way to refuel a liquid-fueled engine, such as a lawn mower, outboard motor, farm machine, or automobile with fuel from an approved container. c. Describe the options available for safely disposing of unwanted flammable, combustible, and hazardous substances in your community. 	<p>6. Conduct a home safety survey with the help of an adult. Then do the following:</p> <ul style="list-style-type: none"> a. Draw a home fire-escape plan, create a home fire-drill schedule, and conduct a home fire drill. b. Identify the location of all smoke alarms in your home and confirm that none are more than 10 years old. Test each smoke alarm and demonstrate regular maintenance of a smoke alarm. c. Explain what to do when you smell natural gas and when you smell smoke. d. Explain how you would report a fire to have the fire department respond. 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 stovetop pan fire. h. Explain what fire safety precautions you should take when you are in a public building.
Fire Safety	<p>7. Fire Safety in Public Buildings. Do the following:</p> <ul style="list-style-type: none"> a. Explain how public buildings are designed for fire safety. b. Explain what fire safety systems and equipment can be found in public buildings. c. Explain what fire safety precautions you should take when you are in a public building. 	<p>7. Do the following:</p> <ul style="list-style-type: none"> a. Demonstrate lighting a match safely, the proper way to extinguish it and to dispose of it. b. Demonstrate the safe way to start a charcoal fire. c. Demonstrate how to safely light a candle. Discuss with your counselor how to safely use candles.

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Fire Safety	<p>8. Fire Safety at Camp. Do the following:</p> <p>a. Explain how the Leave No Trace Seven Principles apply to camping fires.</p> <p>b. Demonstrate lighting a match safely, the proper way to extinguish it, and to dispose of it. Explain the similarities and differences between safety matches and strike-anywhere matches.</p> <p>c. Explain and demonstrate making sparks with flint and steel or with a ferro rod and catching a spark to create a flame. Extinguish the flame safely using one of principles of the fire tetrahedron.</p> <p>d. Demonstrate the safe way to start a charcoal fire.</p> <p>e. Describe three common campsite fire lays. Collect, prepare, and set up tinder, kindling, and fuel for a campfire following the Leave No Trace Seven Principles. Ignite your fire lay and safely extinguish your fire.</p> <p>f. Demonstrate using a camp stove.</p> <p>g. Explain how to set up and keep a campsite safe from fire.</p> <p>h. Develop a lesson plan to teach a fire safety skill or topic, such as lighting a candle or a match or a charcoal fire or a lantern or a camp stove or using flint and steel or setting up a fire lay. Review your lesson plan with your counselor. Teach your skill or topic to one or more Scouts using the EDGE method.</p>	<p>8. Explain the difference between combustible and noncombustible liquids and between combustible and noncombustible fabrics.</p>
Fire Safety	<p>9. Wildland Fires. Do the following:</p> <p>a. List causes of wildland fires and ways to prevent them.</p> <p>b. Explain the social, economic, and environmental consequences of wildland fires.</p>	<p>9. Do the following:</p> <p>a. Describe for your counselor the safe way to refuel a liquid fueled engine, such as a lawn mower, weed eater, outboard motor, farm machine, or automobile with fuel from an approved gasoline container.</p> <p>b. Demonstrate the safety factors, such as proper ventilation, for auxiliary heating devices and the proper way to fuel those devices.</p>
Fire Safety	<p>10. Careers. Do ONE of the following:</p> <p>a. Visit a fire station in-person. Identify the various types of fire service vehicles. From the firefighters you meet during your visit, learn about the fire prevention activities in your community and about their careers. Discuss with your counselor what you learned during your tour and interviews.</p> <p>b. Identify three career opportunities that would use skills and knowledge in the field of fire safety. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.</p>	<p>10. Do the following:</p> <p>a. Explain the costs associated with outdoor and wildland fires and how they can be prevented.</p> <p>b. Demonstrate setting up and putting out a cooking fire.</p> <p>c. Demonstrate using a camp stove and lantern.</p> <p>d. Explain how to set up a campsite safe from fire.</p>
Fire Safety	(delete requirement 11)	<p>11. Visit a fire station. Identify the various types of fire trucks and describe the functions of each. Find out about the fire prevention activities in your community during your visit.</p>
Fire Safety	(delete requirement 12)	<p>12. Determine if smoke detectors are required in all dwellings within your municipality. If so, explain which specific types are required. Tell your counselor what type of smoke detectors your house has or needs.</p>
Fire Safety	(delete requirement 13)	<p>13. 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.</p>
First Aid	<p>1. Handling a First Aid Emergency. Do the following:</p> <p>a. Explain the steps necessary to assess and handle a first aid emergency, including a safety evaluation of the scene.</p> <p>b. Tell how you would obtain emergency medical assistance from your home and from a remote location on a wilderness camping trip.</p> <p>c. Demonstrate the precautions you must take to reduce the risk of transmitting an infection between you and the victim while administering first aid, including the safe disposal of used first aid supplies.</p> <p>d. Demonstrate evaluation of and management of a patient's airway and breathing.</p> <p>e. Demonstrate a thorough examination of an accident victim.</p> <p>f. Discuss why shock is an emergency.</p> <p>g. Define the term triage and describe examples of triage situations that you may encounter.</p>	<p>1. Demonstrate to your counselor that you have current knowledge of all first-aid requirements for Tenderfoot, Second Class, and First Class ranks.</p>
First Aid	<p>2. Preparing for First Aid Emergencies. Do the following:</p> <p>a. Obtain a copy of the Scout Annual Health and Medical Record and discuss the importance of the form including information on immunizations, allergies, medications, health history, and medical examinations to providing first aid at Scouting events.</p> <p>b. Using checklists provided in the First Aid Merit Badge pamphlet or ones approved by your counselor, do the following:</p> <p>1. Assemble a personal first-aid kit for hiking and backpacking. Demonstrate the proper use of each item in your first-aid kit to your counselor.</p> <p>2. With your counselor, inspect a unit, home, vehicle, or camp first-aid kit and discuss your findings.</p>	<p>2. Explain how you would obtain emergency medical assistance from:</p> <p>a. Your home</p> <p>b. A remote location on a wilderness camping trip</p>

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First Aid	<p>3. Wounds with No External Bleeding. Describe the symptoms and signs of, show first aid for, and explain prevention of these wounds:</p> <ul style="list-style-type: none"> a. Closed wounds, such as a bruise (contusion) or a hematoma b. Superficial, partial thickness, and full thickness thermal (heat) burns or scalds c. Chemical burns d. Electrical burns e. Sunburn f. Snow blindness g. Immersion foot, frostnip, frostbite, and ice burns h. Abrasions, such as chafing and rope burns i. Blisters on the hands, feet, buttocks, and shoulders j. Puncture wounds from splinters, rope splinters, nails, and fish hooks k. Rash from poisonous plants l. Bug bites of chiggers, ticks, mosquitoes, and biting gnats m. Bee stings n. Bites of spiders o. Sting of a scorpion p. Bite of a pet or wild mammal or human q. Bite of a venomous snake. 	<p>3. Define the term triage. Explain the steps necessary to assess and handle a medical emergency until help arrives.</p>
First Aid	<p>4. Bleeding Wounds. Describe the symptoms and signs of, show first aid for, and explain prevention of these wounds:</p> <ul style="list-style-type: none"> a. A nosebleed. b. An open wound with mild or moderate bleeding, such as a scratch or a scrape (abrasions), or a shallow cut (laceration). c. An open wound with severe bleeding such as a deep cut on an arm or leg. d. Explain when it is appropriate and is not appropriate to use one or more tourniquets. List some of the benefits and dangers of using a tourniquet. Demonstrate the application of a tourniquet without tightening it. 	<p>4. Explain the precautions you must take to reduce the risk of transmitting an infection between you and the victim while administering first aid.</p>
First Aid	<p>5. Breathing Emergencies. Describe the symptoms and signs of, show first aid for, and explain prevention of these conditions affecting breathing:</p> <ul style="list-style-type: none"> a. Choking b. Asthmatic attack c. Anaphylaxis from an insect bite or sting or from food or product allergy d. Inhalation injuries e. Altitude sickness. 	<p>5. Do the following:</p> <ul style="list-style-type: none"> a. Prepare a first-aid kit for your home. Display and discuss its contents with your counselor. b. With an adult leader, inspect your troop's first-aid kit. Evaluate it for completeness. Report your findings to your counselor and Scout leader.
First Aid	<p>6. Loss of Consciousness. Describe the symptoms and signs of, show first aid for, and explain prevention of these conditions causing loss of consciousness:</p> <ul style="list-style-type: none"> a. Fainting b. Hypoglycemia c. Seizure d. Drug overdose and alcohol poisoning e. Underwater hypoxic blackout f. Cold water shock and drowning g. Lightning strike and electric shock. 	<p>6. Describe the early signs and symptoms of each of the following and explain what actions you should take:</p> <ul style="list-style-type: none"> a. Shock b. Heart attack c. Stroke
First Aid	<p>7. Heart Attack. Do the following:</p> <ul style="list-style-type: none"> a. Explain what a heart attack is. b. Describe the symptoms and signs of a heart attack and first aid for this condition. c. Describe the conditions that must exist before performing CPR on a person. d. Demonstrate proper CPR technique using a training device approved by your counselor. e. Explain the use of an automated external defibrillator (AED). f. Demonstrate or simulate the proper use of an AED, using an AED training device if available. g. Identify the typical location(s) of one or more AED(s) at public facilities in your community, such as, your school, place of worship, unit meeting place, sports facilities, and/or camp or by using a smart phone app. Discuss the reasons for choosing locations like these. 	<p>7. Do the following:</p> <ul style="list-style-type: none"> a. Describe the conditions that must exist before performing CPR on a person. b. Demonstrate proper CPR technique using a training device approved by your counselor. c. Explain the use of an automated external defibrillator (AED). d. Demonstrate or simulate the proper use of an automated external defibrillator (AED), using an AED training device if available. e. Identify the location of the AED at your school, place of worship, and troop meeting place, if one is present.

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MERIT BADGE	UPDATED REQUIREMENT	ORIGINAL REQUIREMENT
First Aid	<p>8. Muscle and Bone Injuries. Do the following:</p> <p>a. Explain the similarities and differences in a strain, a muscle tear, a tendon rupture, a sprain, a dislocation, a simple fracture, and a compound fracture.</p> <p>b. Describe the symptoms and signs of and first aid for a muscle strain, a muscle tear, and a tendon rupture.</p> <p>c. Describe the symptoms and signs of, and potential complications of, a sprain, a fracture, and a dislocation.</p> <p>d. Demonstrate bandages for these injuries:</p> <ol style="list-style-type: none"> 1. Arm slings for forearm or upper arm or collarbone fractures 2. Elastic wrap and cravat bandages for ankle sprain 3. Elastic wrap and cravat bandages for wrist sprain or hand injury. <p>e. Demonstrate the proper procedures for handling and splinting of suspected closed or open fractures or dislocations of the:</p> <ol style="list-style-type: none"> 1. Finger and toe 2. Forearm or wrist 3. Upper leg 4. Lower leg or ankle. 	<p>8. Do the following:</p> <ol style="list-style-type: none"> a. Show the steps that need to be taken for someone who has a large open wound or cut that is not bleeding severely. b. Show the steps that need to be taken for someone who has a large open wound or cut that is severely bleeding. c. Explain when it is appropriate and not appropriate to use a tourniquet. List some of the benefits and dangers of the use of a tourniquet. d. Demonstrate the application of a tourniquet without tightening it.
First Aid	<p>9. Head and Spine Injuries. Do the following:</p> <p>a. Describe the symptoms and signs of, relationships between, possible complications of, and prevention of head, neck, and back injuries.</p> <p>b. Describe the symptoms and signs of and first aid for a concussion.</p> <p>c. Demonstrate first aid for an open head wound with a triangular or other bandage.</p> <p>d. Demonstrate first aid for someone with a suspected neck or back injury.</p>	<p>9. Explain when an insect or bee sting could be life threatening and what action should be taken for prevention and for first aid.</p>
First Aid	<p>10. Moving a Patient. Do the following:</p> <p>a. Describe the conditions under which an injured person should and should not be moved.</p> <p>b. If a sick or an injured person must be moved, tell how you would decide the best method. Demonstrate these methods.</p> <p>c. By yourself and with a partner, demonstrate how to transport a person from a smoke-filled room.</p> <p>d. By yourself and with a partner, demonstrate how to transport a person with a sprained ankle for at least 25 yards.</p> <p>e. With helpers under your supervision, improvise a stretcher and move a presumably unconscious person for at least 25 yards.</p>	<p>10. Describe the signs, symptoms, and potential complications of a fracture and dislocation.</p>
First Aid	<p>11. Heat- and Cold-related Conditions. Describe the symptoms and signs of, show first aid for, and explain prevention of these conditions associated with exertion and/or heat or cold exposure:</p> <ol style="list-style-type: none"> a. Dehydration and over-hydration b. Heat cramps and muscle pain after exertion c. Heat exhaustion d. Heat stroke e. Chest pains associated with cold exposure f. Hypothermia. 	<p>11. Demonstrate the proper procedures for handling and immobilizing suspected closed or open fractures or dislocations of the:</p> <ol style="list-style-type: none"> a. Finger b. Forearm c. Wrist d. Upper leg e. Lower leg f. Ankle
First Aid	<p>12. Mental Health Conditions. Describe the following:</p> <p>a. Reactions associated with at least three stressful situations, such as mountain backpacking, rappelling, a ropes course, speaking before an audience, making a phone call to an adult, taking a swim test, missing home, lighting a match, trying out for a sports team, meeting someone for the first time, or other stressful circumstances.</p> <p>b. The actions that you and others should take to prepare for and manage these situations.</p> <p>c. The indications that someone might be a danger to themselves or others.</p> <p>d. The actions that you should take if you suspect that someone might be a danger to themselves or others.</p>	<p>12. Describe the signs, symptoms, and possible complications and demonstrate care for someone with a suspected injury to the neck or back.</p>

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First Aid	<p>13. Miscellaneous Conditions. Describe the symptoms and signs of, show first aid for, and explain prevention of the following conditions:</p> <ul style="list-style-type: none"> a. Object in the eye b. Broken, chipped, loosened, or knocked out tooth c. Vomiting and diarrhea associated with food poisoning d. Abdominal pain e. Stroke. 	<p>13. Describe the symptoms, proper first-aid procedures, and possible prevention measures for the following conditions:</p> <ul style="list-style-type: none"> a. Concussion b. Anaphylaxis/allergic reactions c. Asthmatic attack d. Bruises e. Sprains or strains f. Hypothermia g. Frostbite h. Burns—first, second, and third degree i. Convulsions/seizures j. Dehydration k. Muscle cramps l. Heat exhaustion m. Heat stroke n. Abdominal pain o. Broken, chipped, or loosened tooth
First Aid	<p>14. With guidance from your counselor, develop a plan to teach a first-aid skill or topic using the EDGE method. Discuss your skill, topic, and plan with your counselor, and then teach your skill or topic to your family or to one or more Scouts.</p>	<p>14. Do the following:</p> <ul style="list-style-type: none"> a. Describe the conditions under which an injured person should be moved. b. If a sick or an injured person must be moved, tell how you would determine the best method. Demonstrate this method. c. With helpers under your supervision, improvise a stretcher and move a presumably unconscious person.
First Aid	<p>15. Do ONE of the following:</p> <ul style="list-style-type: none"> a. Visit an emergency medical station house or training center in person. From the medical first responders that you meet during your visit, learn about how they serve their community and about their careers. Discuss with your counselor what you learned during your tour and interviews. b. Interview an emergency medical services professional about their work. Learn about how they chose this career and about their duties. Discuss what you learned with your counselor and whether you might be interested in this career. c. Identify three career opportunities that would use skills and knowledge in emergency medical services. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities, and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career. d. Identify how you might use the skills and knowledge in the field of emergency medical services to pursue a personal hobby and/or healthy lifestyle. Research the additional training required, expenses, and affiliation with organizations that would help you maximize the enjoyment and benefit you might gain from it. Discuss what you learned with your counselor and share what short-term and long-term goals you might have if you pursued this. 	<p>15. Describe the following:</p> <ul style="list-style-type: none"> a. The indications that someone might be a danger to themselves or others. b. What action you should take if you suspect that someone might be a danger to themselves or others.
First Aid	(delete requirement 16)	16. Teach another Scout a first-aid skill selected by your counselor.
Fish and Wildlife Management	5b. Construct, erect, and check regularly bird feeders and keep written records daily over a two-week period of the kinds of birds visiting the feeders.	5b. Construct, erect, and check regularly bird feeders and keep written records of the kinds of birds visiting the feeders.
Fish and Wildlife Management	6c. Start a scrapbook of North American fish and 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 or guardian'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.	6c. Start a scrapbook of North American fish and 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.
Fish and Wildlife Management	7b. Conduct a creel census on a small lake to estimate catch per unit effort and report the results to your counselor.	7b. Conduct a creel census on a small lake to estimate catch per unit effort.
Fish and Wildlife Management	7c. Examine the stomach contents of three fish and record the findings. It is not necessary to catch any fish for this option.	7c. Examine the stomach contents of three fish and record the findings. It is not necessary to catch any fish for this option. You may visit a cleaning station set up for fishermen or find another, similar alternative.

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Fish and Wildlife Management	7d. 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. Before completing this requirement, check local laws on releasing these organisms back into the wild, and follow your counselor's direction in disposing of these organisms humanly and safely.	7d. 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.
Fish and Wildlife Management	8. Identify three career opportunities that would use skills and knowledge by fish and wildlife professionals. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.	8. Using resources found at the library and in periodicals, books, and the internet (with your parent or guardian's permission), learn about three different positions held by fisheries and/or wildlife professionals. Find out the education and training requirements for each position.
Fishing	1. Do the following: a. Explain to your counselor the most likely hazards you may encounter while participating in fishing activities, and what you should do to anticipate, help prevent, mitigate, and respond to these hazards. b. Discuss the prevention of and treatment for the following health concerns that could occur while fishing: cuts and scratches, puncture wounds, insect bites, hypothermia, dehydration, heat exhaustion, heatstroke, sunburn. c. Explain how to remove a barbed hook that is lodged in someone's arm. d. Name and explain five safety practices you should always follow while fishing.	1. Do the following: a. Explain to your counselor the most likely hazards you may encounter while participating in fishing activities, and what you should do to anticipate, help prevent, mitigate, and respond to these hazards. b. 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. c. Explain how to remove a hook that has lodged in your arm. d. Name and explain five safety practices you should always follow while fishing.
Gardening	5. Visit your county extension agent's office, local university, agricultural college, nursery, farm, or a botanical garden or arboretum. Report on what you learned.	5. Visit your county extension agent's office, local university, agricultural college, nursery, or a botanical garden or arboretum. Report on what you learned.
Gardening	(new) 8f. Grow a garden of your own using soil from seed or plantings to harvest or for 90 days, whichever is earlier. This can be an outdoor garden or indoors using appropriate containers, and should include at least three types of plants approved by your counselor.	New requirement.
Gardening	9. Do ONE of the following: a. Identify three career opportunities that would use skills and knowledge in gardening. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career. b. Identify how you might use the skills and knowledge in gardening to pursue a personal hobby and/or healthy lifestyle. Research the additional training required, expenses, and affiliation with organizations that would help you maximize the enjoyment and benefit you might gain from it. Discuss what you learned with your counselor and share what short-term and long-term goals you might have if you pursued this.	New requirement.
Horsemanship	2. Name 15 parts of a horse and discuss the function of each with your counselor.	2. Name the 15 main parts of a horse.
Insect Study	1. Safety. Do the following: a. Explain to your counselor the most likely hazards associated with exposure to ants and bees and what you should do to anticipate, help prevent, mitigate, and respond to these hazards. b. Discuss the prevention of and treatment for health concerns that could occur while working with ants and bees, including insect bites and anaphylactic shock.	1. Do the following: a. Explain to your counselor the most likely hazards associated with exposure to ants and bees and what you should do to anticipate, help prevent, mitigate, and respond to these hazards. b. Discuss the prevention of and treatment for health concerns that could occur while working with ants and bees, including insect bites and anaphylactic shock.
Insect Study	2. Anatomy. Do the following: a. Tell how insects are different from other animals. b. Show how insects are different from millipedes and spiders. c. Point out and name the main parts of an insect. d. Describe the characteristics that distinguish the major orders of insects.	2. Tell how insects are different from other animals. Show how insects are different from millipedes and spiders. 3. Point out and name the main parts of an insect. 4. Describe the characteristics that distinguish the major orders of insects.
Insect Study	3. Life Cycles. Do the following: a. Compare the life histories of a butterfly and a grasshopper. Tell how they are different. b. Raise an insect through complete metamorphosis from its larval stage to its adult stage (e.g., raise a butterfly or moth from a caterpillar). (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 prohibite(d) In most cases, all specimens should be returned at the location of capture after the requirement has been met. Check with your counselor for those instances where the return of these specimens would not be appropriate.)	8. Compare the life histories of a butterfly and a grasshopper. Tell how they are different. 9. Raise an insect through complete metamorphosis from its larval stage to its adult stage (e.g., raise a butterfly or moth from a caterpillar).*

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Insect Study	<p>4. Observation and Analysis. Do the following:</p> <p>a. Discuss the importance of the Leave No Trace Seven Principles and the Outdoor Code as they relate to insect study. Explain how you have followed the Leave No Trace Seven Principles and the Outdoor Code during field observation, specimen collection, and identification.</p> <p>b. Observe 20 different live species of insects in their habitat. In your observations, include at least four orders of insects.</p> <p>c. Make a scrapbook of the 20 insects you observe in 5(b) 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.</p> <p>d. From your scrapbook collection, select eight species of insects and identify what role they play in the ecosystem.</p>	<p>5. Do the following:</p> <p>a. Observe 20 different live species of insects in their habitat. In your observations, include at least four orders of insects.</p> <p>b. Make a scrapbook of the 20 insects you observe in 5a. 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.</p> <p>6. Do the following:</p> <p>a. From your scrapbook collection, select eight species of insects and identify what role they play in the ecosystem.</p>
Insect Study	<p>5. Social Insects. Do the following:</p> <p>a. Tell things that make social insects different from solitary insects.</p> <p>b. Do ONE of the following:</p> <p>1. Observe an ant colony in a formicarium (ant farm). Find the queen and worker ants. Explain to your counselor the different chambers found within an ant colony.</p> <p>2. Study a hive of bees. Remove the combs and find the queen. Estimate the amount of brood and count the number of queen cells. Explain how to determine the amount of honey in the hive. (If you are allergic to bee stings, pick option 1 above.)</p>	<p>11. Tell things that make social insects different from solitary insects.</p> <p>10. Do ONE of the following:</p> <p>a. Observe an ant colony in a formicarium (ant farm). Find the queen and worker ants. Explain to your counselor the different chambers found within an ant colony.</p> <p>b. Study a hive of bees. Remove the combs and find the queen. Estimate the amount of brood and count the number of queen cells. Explain how to determine the amount of honey in the hive.</p>
Insect Study	<p>6. Ecology. Do the following:</p> <p>a. Tell how insects fit in the food web of other insects, fish, birds, and mammals.</p> <p>b. Explain the role insects serve as pollinators for plants.</p>	<p>12. Tell how insects fit in the food web of other insects, fish, birds, and mammals.</p>
Insect Study	<p>7. Insects and People. Do the following:</p> <p>a. Explain the symbiotic relationship between bees and humankind(d) Explain what colony collapse disorder (CCD) is and some of the possible causes. Discuss how CCD affects our food supply.</p> <p>b. Describe three alternatives to insecticides as a way of preventing crop injury and subsequent yield loss. Explain the advantages and disadvantages of these alternatives.</p>	<p>7. Explain the symbiotic relationship between bees and humankind. Explain what colony collapse disorder (CCD) is and some of the possible causes. Discuss how CCD affects our food supply.</p> <p>6b. Describe three alternatives to insecticides as a way of preventing crop injury and subsequent yield loss. Explain the advantages and disadvantages of these alternatives.</p>
Insect Study	<p>8. Conservation. Do the following:</p> <p>a. Tell the migration route of an insect (e.g., monarch butterfly). Discuss the challenges they face and how Scouts can contribute to their success.</p> <p>b. Find out about an insect that is a threatened or endangered species. Discuss the challenges they face and how Scouts can contribute to their success.</p>	
Insect Study	<p>9. Careers and Hobbies. Do ONE of the following:</p> <p>a. Identify three career opportunities that would use skills and knowledge in Insect Study. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.</p> <p>b. Identify how you might use the skills and knowledge in Insect Study to pursue a personal hobby. Research the additional training required, expenses, and affiliation with organizations that would help you maximize the enjoyment and benefit you might gain from it. Discuss what you learned with your counselor and share what short-term and long-term goals you might have if you pursued this.</p>	<p>13. 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.</p>
Landscape Architecture	<p>5. Identify three career opportunities that would use skills and knowledge in landscape architecture. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.</p>	<p>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.</p>
Law	<p>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. Report your findings to your counselor.</p>	<p>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.</p>

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Law	<p>11. Discuss with your counselor the importance in our society of TWO of the following areas of the law or process:</p> <ol style="list-style-type: none"> Administrative Alternative Dispute Resolution Bankruptcy Biotechnology Environmental Family Immigration Information Technology Intellectual Property, (Copyright, Patents and Trademarks) International Privacy. 	<p>11. Discuss with your counselor the importance in our society of TWO of the following areas of the law:</p> <ol style="list-style-type: none"> Administrative Bankruptcy Environmental Family Immigration Information Technology Intellectual Property International Privacy
Metalwork	<p>4. Do ONE of the following:</p> <ol style="list-style-type: none"> Identify three career opportunities that would use skills and knowledge in metalworking. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career. Identify how you might use the skills and knowledge in metalworking to pursue a personal hobby. Research the additional training required, expenses, and affiliation with organizations that would help you maximize the enjoyment and benefit you might gain from it. Discuss what you learned with your counselor and share what short-term and long-term goals you might have if you pursued this. 	<p>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.</p>
Motorboating	<p>1b. Explain first aid for injuries or illnesses that could occur while motorboating, including hypothermia, heat reactions, dehydration, motion sickness, bug bites, blisters.</p>	<p>1b. Explain first aid for injuries or illnesses that could occur while motorboating, including hypothermia, heat reactions, dehydration, motion sickness, bugbites, and blisters.</p>
Motorboating	<p>5. With your counselor or other adults on board, demonstrate proper boat-handling procedures and skills by doing the following:</p> <ol style="list-style-type: none"> Board and assist others in boarding. Confirm that all passengers on board are wearing properly fitted life jackets. Fuel the boat and complete a safety check. If equipped, attach the engine cut-off switch link and safely start the motor. Get underway from dockside or from a beach launch. Run a course for at least a mile, showing procedures for overtaking and passing slower vessels, yielding right-of-way, passing oncoming traffic, making turns, reversing direction, and using navigation aids. Stop and secure the boat in position on the open water using anchors. Raise and stow the anchor and get underway. Land or dock the boat, disembark, and assist others in doing the same. Moor, dock, or beach the boat and secure all gear. Demonstrate knots used in boating: cleating hitch, bowline, clove hitch, anchor bend, sheet bend. 	<p>5. With your counselor or other adults on board, demonstrate proper boat-handling procedures and skills by doing the following:</p> <ol style="list-style-type: none"> Board and assist others in boarding. Confirm that all passengers on board are wearing properly fitted life jackets. Fuel the boat and complete a safety check. If equipped, attach a kill switch and safely start the motor. Get underway from dockside or from a beach launch. 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. Stop and secure the boat in position on the open water using anchors. Raise and stow the anchor and get underway. Land or dock the boat, disembark, and assist others in doing the same. Moor, dock, or beach the boat and secure all gear.
Nature	<p>4d Insects and Spiders</p> <p>1. Collect and identify either in the field or through photographs 10 species of insects or spiders. Photos may be taken with your own equipment or gathered from other sources.</p>	<p>4d Insects and Spiders</p> <p>1. Collect and identify either in the field or through photographs 10 species of insects or spiders.*</p> <p>*-Photos may be taken with your own equipment or gathered from other sources.</p>
Nature	<p>5. Discuss the importance of the Leave No Trace Seven Principles and the Outdoor Code and how they relate to nature. Explain how you have followed the Leave No Trace Seven Principles and the Outdoor Code while in natural areas during field observation, specimen collection, and identification.</p>	<p>5. Discuss the principle of Leave No Trace and how it relates to nature.</p>
Nature	<p>(new) 7. Do ONE of the following:</p> <ol style="list-style-type: none"> Identify three career opportunities that would use skills and knowledge in Nature. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career. Identify how you might use the skills and knowledge in Nature to pursue a personal hobby. Research the additional training required, expenses, and affiliation with organizations that would help you maximize the enjoyment and benefit you might gain from it. Discuss what you learned with your counselor and share what short-term and long-term goals you might have if you pursued this. 	

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Plumbing	<p>6. Do FOUR of the following, each under the supervision of a knowledgeable adult:</p> <p>a. Visit the plumbing section of a hardware store or home center and identify:</p> <ol style="list-style-type: none"> 1. PVC pipe and fittings 2. CPVC pipe and fittings 3. PEX pipe and fittings 4. Copper pipe and fittings 5. Steel pipe and fittings 6. Specialty plumbing tools. <p>b. Cut, clean (debur), PVC or CPVC pipe; solvent weld at least three connections to include a coupling, tee, and elbow.</p> <p>c. Cut PEX pipe; make at least one connection using either a quick-connect fitting or a crimp fitting (using specialized tools).</p> <p>d. Solder a copper connection using a gas torch.</p> <p>e. Replace a kitchen or lavatory faucet.</p> <p>f. Remove, clean or replace, and reinstall a sink or lavatory drain trap.</p> <p>g. Properly apply pipe thread tape to a pipe or a plumbing connector.</p>	<p>6. Cut, thread, and connect two pieces of metal pipe.</p> <p>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.</p> <p>8. Do the following:</p> <ol style="list-style-type: none"> a. Replace a washer in a faucet. b. Clean out a sink or lavatory trap.
Plumbing	<p>(new) 7. Identify three career opportunities that would use skills and knowledge in plumbing. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.</p>	
Pottery	<p>2a. Explain the properties and ingredients of a good clay body for the following:</p> <ol style="list-style-type: none"> 1. Making sculpture using the hand-building method. 2. Throwing on the wheel. 	<p>2a. Explain the properties and ingredients of a good clay body for the following:</p> <ol style="list-style-type: none"> 1. Making sculpture 2. Throwing on the wheel
Pottery	<p>5d. Help an experienced adult to load and fire a kiln OR describe in detail how to load and fire a kiln.</p>	<p>5d. Help to fire a kiln.</p>
Programming	<p>2. History. Discuss with your counselor the history of programming and the evolution of programming languages, including at least three milestones related to the advancement or development of programming over time.</p>	<p>2. History. Do the following:</p> <ol style="list-style-type: none"> a. Give a brief history of programming, including at least three milestones related to the advancement or development of programming. b. Discuss with your counselor the history of programming and the evolution of programming languages.
Programming	<p>5. Project. With your counselor's guidance, select three different programming languages and development environments. For each subrequirement below, do the following: Write or modify a program using the indicated programming language and development environment. The program must take input and produce output based on computations and decisions made on the input. Debug and demonstrate the program to your counselor. Explain how each program processes inputs, makes decisions based on those inputs, and provides outputs based on computations and decision making.</p> <ol style="list-style-type: none"> a. In the first language and environment, write or modify a program, debug and demonstrate, and explain as above. b. In the second language and environment, write or modify a program, debug and demonstrate, and explain as above. c. In the third language and environment, write or modify a program, debug and demonstrate, and explain as above. 	<p>5. Project. Do the following:</p> <ol style="list-style-type: none"> a. With your counselor's approval, choose a sample program. Modify the code or add a function or subprogram to it. Debug and demonstrate the modified program to your counselor. b. With your counselor's approval, choose a second programming language and development environment, different from those used for requirement 5a and in a different industry from 5a. Then write, debug, and demonstrate a functioning program to your counselor, using that language and environment. c. With your counselor's approval, choose a third programming language and development environment, different from those used for requirements 5a and 5b and in a different industry from 5a or 5b. Then write, debug, and demonstrate a functioning program to your counselor, using that language and environment. d. Explain how the programs you wrote for requirements 5a, 5b, and 5c process inputs, how they make decisions based on those inputs, and how they provide outputs based on the decision making.
Reptile and Amphibian Study	<p>8a. Take custody of one or more reptiles or amphibians in a manner approved by your counselor. 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). Whichever you chose, keep records of and report to your counselor how you cared for your animal/eggs/larvae to include lighting, habitat, temperature and humidity maintenance and any veterinary care requirements. Unless you are the long-term owner, at the conclusion of this study, turn the animal(s) over to another responsible party approved by your counselor.</p>	<p>8a. 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). Whichever you chose, keep records of and report to your counselor how you cared for your animal/eggs/larvae to include lighting, habitat, temperature and humidity maintenance and any veterinary care requirements.</p>

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Reptile and Amphibian Study	<p>8b. Choose a reptile or amphibian that you can observe or foster at a local zoo, aquarium, nature center, local rescue, or other such exhibit (such as your classroom or school). Study the specimen weekly for a periods 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. Discuss with your counselor how the animal you observed was cared for to include its housing and habitat, how the lighting, temperature, and humidity were maintained, and any veterinary care requirements.</p> <p>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.</p>	<p>8b. 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 periods 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. Discuss with your counselor how the animal you observed was cared for to include its housing and habitat, how the lighting, temperature, and humidity were maintained, and any veterinary care requirements.</p> <p>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.</p>
Rifle Shooting	<p>1. Do the following:</p> <ol style="list-style-type: none"> Explain what a projectile is, and why any device that shoots a projectile at high speed must be handled with care and respect, and used only in approved locations. Explain the basic rules of safe gun handling that apply to all firearms. Describe how you would react if a friend visiting your home asked to see your or your family's firearm. Explain the need for, types, and use of eye protection and hearing protection. Explain the main points of the laws for owning and using guns in your community and state. Explain how hunting is related to the wise use of renewable wildlife resources. Successfully complete a state hunter education course, or obtain a copy of the hunting laws for your state, then do the following. <ol style="list-style-type: none"> Explain the main points of hunting laws in your state, and any special laws on the use of guns and ammunition, AND List the kinds of wildlife that can be legally hunted in your state. Explain to your counselor the proper hygienic guidelines followed while shooting. Identify places in your community where you can join or be a part of range and target activities. Discuss with your counselor a list of sources you could contact for information on firearms and their use. 	<p>1. Do the following:</p> <ol style="list-style-type: none"> Explain why BB and pellet air guns must always be treated with the same respect as firearms. Describe how you would react if a friend visiting your home asked to see your or your family's firearm(s). Explain the need for, and use and types of, eye and hearing protection. Demonstrate their proper use. Give the main points of the laws for owning and using guns in your community and state. Explain how hunting is related to the wise use of renewable wildlife resources. Successfully complete a state hunter education course or obtain a copy of the hunting laws for your state, then do the following: <ol style="list-style-type: none"> Explain the main points of hunting laws in your state and give any special laws on the use of guns and ammunition. List the kinds of wildlife that can be legally hunted in your state. Identify and explain how you can join or be a part of shooting sports activities. Explain to your counselor the proper hygienic guidelines used in shooting. Give your counselor a list of sources that you could contact for information on firearms and their uses.
Rifle Shooting	<p>2. Working under the supervision of a certified National Rifle Association (NRA) Rifle instructor and a certified range safety officer, at a nationally authorized camp property or at a commercial firearm range (as defined in the Scouting America National Range and Target Activities Manual), do ONE of the following Options:</p>	<p>2. Do ONE of the following options:</p>
Rifle Shooting	<p>2 Option A: Rifle Shooting (Modern Cartridge Type)</p> <ol style="list-style-type: none"> Identify the three main parts of a rifle, and explain how they function. Identify and demonstrate the rules for safely storing and handling a rifle. Identify the two types of cartridges, their parts, and how they function. Explain to your counselor what a misfire, hangfire, and squib fire are. Explain and demonstrate proper preventive measures, and the procedures to follow in response to each. Explain and demonstrate the five fundamentals of shooting a rifle: aiming, breath control, hold control, trigger control, and follow-through. Demonstrate the knowledge, skills, and attitude necessary to safely shoot a rifle on a range, including understanding and following range procedures and commands. Explain the basic safety rules for cleaning a rifle, and identify the materials needed. Demonstrate how to clean a rifle properly and safely. Discuss what points you would consider in selecting a rifle. Using a bolt-action .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 touched by a quarter. Using these targets, explain how to adjust sights to zero a rifle. Adjust sights to center the group on the target and fire five groups (five shots per group). In the event that your instructor determines it is not practical to adjust the sights -- for instance, on a borrowed rifle -- you may explain (rather than doing) how to adjust the sights, and then fire five groups (five shots per group) in which all shots can be touched by a quarter. According to the target used, each shot in the group must meet the following minimum score: A-32 targets: 9; A-17 or TQ-1 targets: 7; A-36 targets: 5. 	<p>2 Option A—Rifle Shooting (Modern cartridge type)</p> <ol style="list-style-type: none"> Identify the three main parts of a rifle, and tell how they function. Identify and demonstrate the three fundamental rules for safe gun handling. Identify the two types of cartridges, their parts, and how they function. Explain to your counselor what a misfire, hangfire, and squib fire are, and explain the procedures to follow in response to each. Identify and demonstrate the five fundamentals of shooting a rifle safely. 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. Explain the range commands and range procedures. 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. Identify the basic safety rules for cleaning a rifle, and identify the materials needed. Demonstrate how to clean a rifle properly and safely. Discuss what points you would consider in selecting a rifle. 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. 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.

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MERIT BADGE	UPDATED REQUIREMENT	ORIGINAL REQUIREMENT
Rifle Shooting	<p>2 Option B: Air Rifle Shooting (BB or Pellet)</p> <p>a. Identify the three main parts of an air rifle, and explain how they function.</p> <p>b. Identify and demonstrate the rules for safely storing and handling an air rifle.</p> <p>c. Identify the two most common types of air rifle ammunition.</p> <p>d. Explain and demonstrate the five fundamentals of shooting an air rifle: aiming, breath control, hold control, trigger control, and follow-through.</p> <p>e. Demonstrate the knowledge, skills, and attitude necessary to safely shoot on a range, including understanding and following range procedures and commands.</p> <p>f. Explain the basic safety rules for cleaning an air rifle, and identify the materials needed.</p> <p>g. Demonstrate how to clean an air rifle properly and safely.</p> <p>h. Discuss what points you would consider in selecting an air rifle.</p> <p>i. Using a BB gun or pellet rifle and shooting from a benchrest or supported prone position at 15 feet for BB guns or 33 feet for pellet rifles, fire five groups (three shots per group) that can be touched by a quarter.</p> <p>j. Adjust sights to center the group on the target and fire five groups (five shots per group). In the event that your instructor determines it is not practical to adjust the sights -- for instance, on a borrowed air rifle -- you may explain (rather than doing) how to adjust the sights, and then fire five groups (five shots per group) in which all shots can be touched by a quarter. According to the target used, each shot in the group must meet the following minimum score: BB rifle at 15 feet (or 5 meters) using TQ-5 targets: 8; Pellet rifle at 25 feet using TQ-5 targets: 8; Pellet rifle at 33 feet (or 10 meters) using AR-1 targets: 6.</p>	<p>2 Option B—Air Rifle Shooting (BB or pellet)</p> <p>a. Identify the three main parts of an air rifle, and tell how they function.</p> <p>b. Identify and demonstrate the three fundamental rules for safe gun handling.</p> <p>c. Explain the range commands and range procedures.</p> <p>d. Identify the two most common types of air rifle ammunition.</p> <p>e. Identify and demonstrate the five fundamentals of shooting a rifle safely.</p> <p>f. Identify and explain each rule for shooting an air rifle safely.</p> <p>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.</p> <p>h. Identify the basic safety rules for cleaning an air rifle, and identify the materials needed.</p> <p>i. Demonstrate how to clean an air rifle safely.</p> <p>j. Discuss what points you would consider in selecting an air rifle.</p> <p>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.</p> <p>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.</p>
Rifle Shooting	<p>2 Option C: Muzzleloading Rifle Shooting</p> <p>a. Discuss with your counselor a brief history of the development of muzzleloading rifles.</p> <p>b. Identify principal parts of muzzleloading rifles and discuss how they function.</p> <p>c. Identify and demonstrate the rules for safely storing and handling a muzzleloading rifle.</p> <p>d. Identify the various grades of black powder and explain their proper and safe use.</p> <p>e. Discuss proper safety procedures pertaining to black powder storage.</p> <p>f. Discuss proper components of a load.</p> <p>g. Identify proper procedures and accessories used for safely loading a muzzleloading rifle.</p> <p>h. Identify the causes of a muzzleloading rifle’s failure to fire, and explain what a misfire, hangfire, and squib fire are. Explain and demonstrate proper preventive measures, and the procedures to follow in response to each.</p> <p>i. Demonstrate the knowledge, skills, and attitude necessary to safely shoot a muzzleloading rifle on a range, including understanding and following range procedures and commands.</p> <p>j. Explain the basic safety rules for cleaning a muzzleloading rifle, and identify the materials needed.</p> <p>k. Demonstrate how to clean a muzzleloading rifle properly and safely.</p> <p>l. Discuss what points you would consider in selecting a muzzleloading rifle.</p> <p>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.</p> <p>n. Adjust the sights to center the group on the target and fire three groups (five shots per group). In the event that your instructor determines it is not practical to adjust the sights -- for instance, on a borrowed muzzleloading rifle -- you may explain (rather than doing) how to adjust the sights, and then fire three groups (five shots per group) in which all shots can be covered by the base of a standard-size soft drink can. According to the target used, each shot in the group must meet the following minimum score: at 25 yards using NRA A-23 or NMLRA 50-yard targets: 7; at 50 yards using NRA A-25 or NMLRA 100-yard targets: 7.</p>	<p>2 Option C—Muzzleloading Rifle Shooting</p> <p>a. Give a brief history of the development of muzzleloading rifles.</p> <p>b. Identify principal parts of percussion rifles and discuss how they function.</p> <p>c. Demonstrate and discuss the safe handling of muzzleloading rifles.</p> <p>d. Identify the various grades of black powder and black powder substitutes and explain their proper use.</p> <p>e. Discuss proper safety procedures pertaining to black powder use and storage.</p> <p>f. Discuss proper components of a load.</p> <p>g. Identify proper procedures and accessories used for loading a muzzleloading rifle.</p> <p>h. Demonstrate the knowledge, skills, and attitude necessary to safely shoot a muzzleloading rifle on a range, including range procedures. Explain what a misfire, hangfire, and squib fire are, and explain the procedures to follow in response to each.</p> <p>i. Shoot a target with a muzzleloading rifle using the five fundamentals of firing a shot.</p> <p>j. Identify the materials needed to clean a muzzleloading rifle safely. Using these materials, demonstrate how to clean a muzzleloading rifle safely.</p> <p>k. Identify the causes of a muzzleloading rifle’s failure to fire and explain or demonstrate proper correction procedures.</p> <p>l. Discuss what points you would consider in selecting a muzzleloading rifle.</p> <p>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.</p> <p>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.</p>
Rifle Shooting	<p>(new) 3. Identify how you could apply the skills and knowledge of safe and responsible use of firearms you learned in this merit badge to pursue a career or personal hobby. Research the additional training and experience you would need, expenses you may incur, and the affiliation with organizations that could help you maximize the positive impact and enjoyment you gain from it. Discuss what you learned with your counselor, and share what short-term and long-term goals you might have if you pursued this.</p>	

SCOUTS BSA MERIT BADGE COMMITTEE
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MERIT BADGE	UPDATED REQUIREMENT	ORIGINAL REQUIREMENT
Shotgun Shooting	<p>1. Do the following:</p> <ul style="list-style-type: none"> a. Explain what a projectile is, and why any device that shoots a projectile at high speed must be handled with care and respect, and used only in approved locations. b. Explain the basic rules of safe gun handling that apply to all firearms. c. Describe how you would react if a friend visiting your home asked to see your or your family's firearm. d. Explain the need for, types, and use of eye protection and hearing protection. e. Explain the main points of the laws for owning and using guns in your community and state. f. Explain how hunting is related to the wise use of renewable wildlife resources. g. Successfully complete a state hunter education course, or obtain a copy of the hunting laws for your state, then do the following. <ul style="list-style-type: none"> 1. Explain the main points of hunting laws in your state, and 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. h. Explain to your counselor the proper hygienic guidelines followed while shooting. i. List and explain three shotgun sports. Identify places in your community where you could practice these sports, and explain how you can join or be a part of range and target activities. j. Discuss with your counselor a list of sources you could contact for information on firearms and their use. 	<p>1. Do the following:</p> <ul style="list-style-type: none"> 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. <ul style="list-style-type: none"> 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.
Shotgun Shooting	<p>2. Working under the supervision of a certified National Rifle Association (NRA) Shotgun instructor and a certified range safety officer, at a nationally authorized camp property or at a commercial firearm range (as defined in the Scouting America National Range and Target Activities Manual), do ONE of the following Options:</p>	<p>2. Do ONE of the following options:</p>
Shotgun Shooting	<p>2 Option A: Shotgun Shooting (Modern Shotshell Type)</p> <ul style="list-style-type: none"> a. Identify and explain the principal parts of a shotgun, action types, and how they function. b. Identify and demonstrate the rules for safely storing and handling a shotgun. c. Identify the parts of a shotgun shell and their functions. d. Identify the various gauges of shotguns. Explain which you would choose for a particular use and why. e. Identify the causes of a shotgun's failure to fire, and explain what a misfire, hangfire, and squib fire are. Explain and demonstrate proper preventive measures, and the procedures to follow in response to each. f. Demonstrate the knowledge, skills, and attitude necessary to safely shoot a shotgun on a range, including understanding and following range procedures and commands. g. Explain the basic safety rules for cleaning a shotgun, and identify the materials needed. h. Demonstrate how to clean a shotgun properly and safely. i. Discuss what points you would consider in selecting a shotgun. j. Shoot a moving target with a shotgun using the four fundamentals of firing a shot --position, mount, vision, and movement. k. Shooting score required: Hit at least 12 out of 25 targets (48 percent) in two 25-target groups. The two groups need not be shot in consecutive order. A minimum of 50 shots must be fired. Shooting skill rules: <ul style="list-style-type: none"> -Targets may be thrown by a hand trap, manual mechanical trap, or on any trap or skeet field. If using a hand trap or manual mechanical trap, the trap operator should be at least 5 feet to the right and 3 feet to the rear of the shooter. If throwing left-handed with a hand trap, the trap operator should be at least 5 feet to the left and 3 feet to the rear of the shooter. -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, but only under approved supervision and at an approved range as noted in the Scouting America National Range and Target Activities Manual. -Modern, age-appropriate, target shotgun models, 12-, 16- or 20-gauge, may be used. -Only commercially manufactured ammunition may be used. Reloads may not be used in Scouting America range and target activities. -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. -If using a trap field, shoot station 3 with traps set to throw straightaway targets. -If using a skeet field, shoot station 7 low house. 	<p>2 Shotgun Shooting (Modern Shotshell Type) Option A</p> <ul style="list-style-type: none"> 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. Explain what a misfire, hangfire, and squib fire are, and explain the procedures to follow in response to each. 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 properly and safely. j. Discuss what points you would consider in selecting a shotgun. k. Shooting score required—Hit at least 12 out of 25 targets (48 percent) in two 25-target groups. The two groups need not be shot in consecutive order. A minimum of 50 shots must be fired. Shooting skill rules: <ul style="list-style-type: none"> -Targets may be thrown by a hand trap, manual mechanical trap, or on any trap or skeet field. Note: If using a hand trap or manual mechanical trap, the trap operator should be at least 5 feet to the right and 3 feet to the rear of the shooter. If throwing left-handed with a hand trap, the trap operator should be at least 5 feet to the left and 3 feet to the rear of the shooter. -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. -Only commercially manufactured ammunition may be used. Reloads may not be used in BSA shooting sports programs. -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). -If using a trap field, shoot station 3 with traps set to throw straightaway targets. -If using a skeet field, shoot station 7 low house.

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Shotgun Shooting	<p>2 Option B: Muzzleloading Shotgun Shooting</p> <p>a. Discuss with your counselor a brief history of the development of the muzzleloading shotgun.</p> <p>b. Identify principal parts of muzzleloading shotguns and discuss how they function.</p> <p>c. Identify and demonstrate the rules for safely storing and handling a muzzleloading shotgun.</p> <p>d. Identify the various grades of black powder and explain their proper and safe use.</p> <p>e. Discuss proper safety procedures pertaining to black powder storage.</p> <p>f. Discuss proper components of a load.</p> <p>g. Identify proper procedures and accessories used for safely loading a muzzleloading shotgun.</p> <p>h. Identify the causes of a muzzleloading shotgun's failure to fire, and explain what a misfire, hangfire, and squib fire are. Explain and demonstrate proper preventive measures, and the procedures to follow in response to each.</p> <p>i. Demonstrate the knowledge, skills, and attitude necessary to safely shoot a muzzleloading shotgun on a range, including understanding and following range procedures and commands.</p> <p>j. Explain the basic safety rules for cleaning a muzzleloading shotgun, and identify the materials needed.</p> <p>k. Demonstrate how to clean a muzzleloading shotgun properly and safely.</p> <p>l. Discuss what points you would consider in selecting a muzzleloading shotgun.</p> <p>m. Shoot a moving target with a muzzleloading shotgun using the four fundamentals of firing a shot -- position, mount, vision, and movement.</p> <p>n. Shooting score required: Hit at least 5 out of 15 targets in each of two 15-target groups. The two groups need not be shot in consecutive order. A minimum of 30 shots must be fired. Shooting skill rules:</p> <ul style="list-style-type: none"> -Targets may be thrown by a hand trap, manual mechanical trap, or on any trap or skeet field. If using a hand trap or manual mechanical trap, the trap operator should be at least 5 feet to the right and 3 feet to the rear of the shooter. If throwing left-handed with a hand trap, the trap operator should be at least 5 feet to the left and 3 feet to the rear of the shooter. -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, but only under approved supervision and at an approved range as noted in the Scouting America National Range and Target Activities Manual. -A 10 gauge or smaller muzzleloading rifle in appropriate size for the participant may be used. Matchlock, wheellock, or flintlock firearms are not approved. -Standard clay targets customarily used for trap and skeet are to be used. -On a standard trap field, the shooter should be positioned 8 yards behind the trap house. -The trap should be set to throw only straightaway targets. -If using a skeet field, shoot station 7 low house. 	<p>2 Muzzleloading Shotgun Shooting Option B</p> <p>a. Discuss a brief history of the development of the muzzleloading shotgun.</p> <p>b. Identify principal parts of percussion and flintlock shotguns and discuss how they function.</p> <p>c. Demonstrate and explain the rules of safely handling a muzzleloading shotgun.</p> <p>d. Identify the various grades of black powder and their proper and safe use.</p> <p>e. Discuss proper safety procedures pertaining to black powder use and storage.</p> <p>f. Discuss proper components of a load.</p> <p>g. Identify proper procedures and accessories used for safely loading a muzzleloading shotgun.</p> <p>h. Demonstrate the knowledge, skills, and attitude necessary to safely shoot a muzzleloading shotgun on a range, including range procedures. Explain what a misfire, hangfire, and squibfire are, and explain the procedures to follow in response to each.</p> <p>i. Shoot a moving target with a muzzleloading shotgun using the five fundamentals of firing the shot.</p> <p>j. Identify the materials needed to clean a muzzleloading shotgun properly and safely.</p> <p>k. Demonstrate how to clean to clear a muzzleloading shotgun's failure to fire and explain or demonstrate proper correction procedures.</p> <p>l. Identify the causes of a muzzleloading shotgun's failure to fire and explain or demonstrate proper preventive procedures.</p> <p>m. Discuss what points you would consider in selecting a muzzleloading shotgun.</p> <p>n. Shooting score required—Hit at least 5 out of 15 targets in each of two 15-target groups. The two groups neednot be shot in consecutive order. A minimum of 30 shots must be fired. Shooting skill rules:</p> <ul style="list-style-type: none"> -Targets may be thrown by a hand trap, manual mechanical trap, or on any trap or skeet field. Note: If using a hand trap or manual mechanical trap, the trap operator should be at least 5 feet to the right and 3 feet to the rear of the shooter. If throwing left-handed with a hand trap, the trap operator should be at least 5 feet to the left and 3 feet to the rear of the shooter. -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. -On a standard trap field, the shooter should be positioned 8 yards behind the trap house. The trap should be set to throw only straightaway targets. -On a skeet field, use station 7 low house.
Shotgun Shooting	<p>(new) 3. Identify how you could apply the skills and knowledge of safe and responsible use of firearms you learned in this merit badge to pursue a career or personal hobby. Research the additional training and experience you would need, expenses you may incur, and the affiliation with organizations that could help you maximize the positive impact and enjoyment you gain from it. Discuss what you learned with your counselor, and share what short-term and long-term goals you might have if you pursued this.</p>	
Skating	<p>1b. Show that you know first aid for injuries or illnesses that could occur while skating, including hypothermia, frostbite, lacerations, abrasions, fractures, sprains and strains, concussions, blisters, heat-related reactions, and shock.</p>	<p>1b. Show that you know first aid for injuries or illnesses that could occur while skating, including hypothermia, frostbite, lacerations, abrasions, fractures, sprains and strains, blisters, heat-related reactions, and shock.</p>
Skating	<p>2 Ice Skating b1. Skate forward at least 40 feet and come to a complete stop. Use either a two-foot snowplow stop or a one-foot snowplow stop.</p>	<p>2 Ice Skating b1. 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.</p>
Skating	<p>2 Roller Skating c1. Perform the forward crossover.</p>	<p>2 Roller Skating c1. Perform the crosscut.</p>
Snow Sports	<p>1b. Discuss first aid and prevention for the types of injuries or illnesses that could occur while participating in snow sports, including hypothermia, frostbite, shock, dehydration, sunburn, concussion, fractures, bruises, sprains, strains. Tell how to apply splints.</p>	<p>1b. Discuss first aid and prevention for the types of injuries or illnesses that could occur while participating in snow sports, including hypothermia, frostbite, shock, dehydration, sunburn, fractures, bruises, sprains, and strains. Tell how to apply splints.</p>
Sports	<p>1a. Explain to your counselor the most likely risks you may encounter while participating in sports and what you should do to anticipate, help prevent, mitigate, and respond to these risks.</p>	<p>1a. Explain to your counselor the most likely risks you may encounter during athletic activities and what you should do to anticipate, help prevent, mitigate, and respond to these risks.</p>
Sports	<p>1b. Show that you know first aid or understand the treatment for injuries that could occur while participating in sports, including sprains; strains; muscle cramps; contusions; abrasions; blisters; dehydration; heat reactions; fractures; injured teeth; head, neck, and back injuries; and concussions.</p>	<p>1b. Show that you know first aid or understand the treatment for injuries that could occur while participating in athletics, including sprains, strains, muscle cramps, contusions, abrasions, blisters, dehydration, heat reactions, and concussions.</p>

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Sports	<p>4. Select TWO of the following sports and discuss with your counselor how you will complete the requirements in 5a through 5h for each sport: badminton, baseball, basketball, bowling, cross-country, diving, field hockey, flag football, flag team, golf, gymnastics, ice hockey, lacrosse, soccer, softball, spirit/cheerleading, swimming, tackle football, table tennis, tennis, track and field, volleyball, water polo, and/or wrestling. Your counselor may approve in advance other recognized sports, but not any sport that is prohibited by Scouting America. The sports you choose must include regular practice sessions and at least four structured, officiated, scored games, meets, or contests against other competitive individuals or organized teams during the period of participation.</p>	<p>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, golf, gymnastics, ice hockey, lacrosse, soccer, softball, swimming, table tennis, tennis, track and field, volleyball, water polo, wrestling, cheerleading, and/or badminton. Your counselor may approve in advance other recognized sports, but not any sport that is restricted and not authorized by the BSA:</p> <p>Then with your chosen sports do the following:</p> <ol style="list-style-type: none"> Give the rules and etiquette for the two sports you picked. 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. Draw diagrams of the playing area for your two sports.
Sports	<p>5. Do the following:</p> <ol style="list-style-type: none"> With guidance from your counselor, establish a suitable personal training program that you will follow throughout your competition season (or for three months). Create a chart or other tracking system, and document your training, practice, and development during this time. Demonstrate proper technique to play each sport effectively and avoid injury. List and describe the equipment needed for each sport, including protective equipment and any specialized clothing. List and explain the rules and proper etiquette of each sport. Draw and explain a diagram of the playing area for each sport. Participate in each sport as a competitive individual or as a member of an organized team for one season (or for three months). 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. 	<p>5. With guidance from your counselor and before beginning requirement 4, establish a personal training program suited to the activities you chose for requirement 4.</p> <p>Do the following:</p> <ol style="list-style-type: none"> Organize a chart and track your training, practice, and development in the sports for one season or four months Demonstrate proper technique for your two chosen sports. 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. <p>[From old requirement 4 above, reordered to match new 5.]</p> <ol style="list-style-type: none"> 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. Give the rules and etiquette for the two sports you picked. Draw diagrams of the playing area for your two sports. <p>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:</p>
Sports	<p>(new) 6. Do ONE of the following:</p> <ol style="list-style-type: none"> Identify three career opportunities that would use skills and knowledge related to a sport. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career. Identify how you might use skills and knowledge related to a sport to pursue a personal hobby and/or healthy lifestyle. Research the additional training required, expenses, and affiliation with organizations that would help you maximize the enjoyment and benefit you might gain from it. Discuss what you learned with your counselor and share what short-term and long-term goals you might have if you pursued this. 	

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