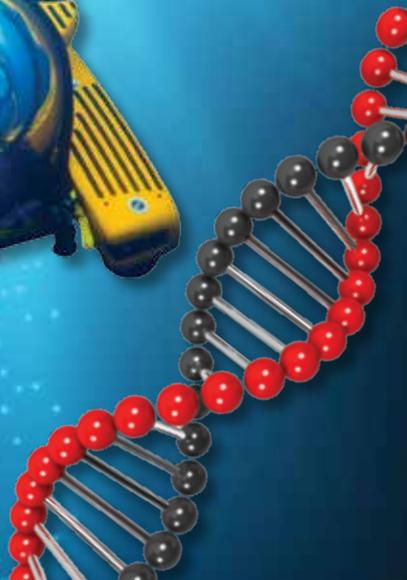


MERIT BADGE SERIES



EXPLORATION



BOY SCOUTS OF AMERICA®

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EXPLORATION



"Enhancing our youths' competitive edge through merit badges"

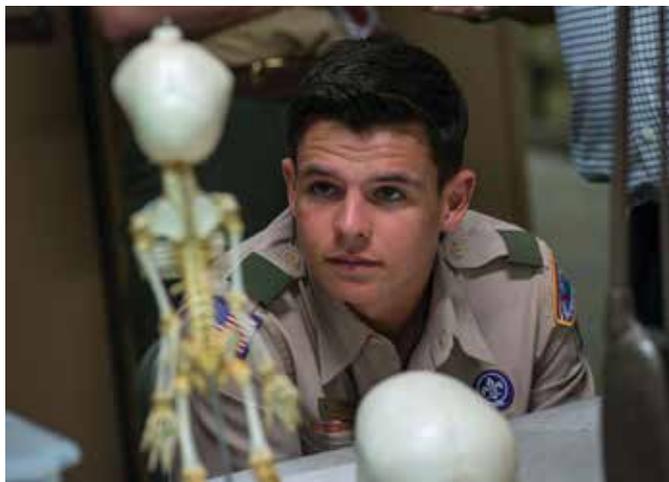


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Requirements

1. **General Knowledge.** Do the following:
 - a. Define exploration and explain how it differs from adventure travel, trekking or hiking, tour-group trips, or recreational outdoor adventure trips.
 - b. Explain how approaches to exploration may differ if it occurs in the ocean, in space, in a jungle, or in a science lab in a city.
2. **History of Exploration.** Discuss with your counselor the history of exploration. Select a field of study with a history of exploration to illustrate the importance of exploration in the development of that field (for example, aerospace, oil industry, paleontology, oceanography, etc.).
3. **Importance of Exploration.** Explain to your counselor why it is important to explore. Discuss the following:
 - a. Why it is important for exploration to have a scientific basis
 - b. How explorers have aided in our understanding of our world
 - c. What you think it takes to be an explorer
4. **Real-Life Exploration.** Do ONE of the following:
 - a. Learn about a living explorer. Create a short report or presentation (verbal, written, or multimedia slide presentation) on this individual's objectives and the achievements of one of the explorer's expeditions. Share what you have learned with your counselor and unit.
 - b. Learn about an actual scientific exploration expedition. Gather information about the mission objectives and the expedition's most interesting or important discoveries. Share what you have learned with your counselor and unit. Tell how the information gained from this expedition helped scientists answer important questions.

- c. Learn about types of exploration that may take place in a laboratory or scientific research facility (medicine, biology, chemistry, physics, astronomy, etc.). Explain to your counselor how laboratory research and exploration are similar to field research and exploration.



5. **Exploration in Lab and Field.** Do ONE of the following, and share what you learn with your counselor:
- With your parent's permission and counselor's approval, visit either in person or via the internet an exploration sponsoring organization (such as The Explorers Club, National Geographic Society, Smithsonian Institution, Alpine Club, World Wildlife Fund, or similar organization). Find out what type(s) of exploration the organization supports.
 - With permission and approval, visit either in person or via the internet a science lab, astronomical observatory, medical research facility, or similar site. Learn what exploration is done in this facility.

As you work on the Exploration merit badge, remember to always use the buddy system. Whether you are out in the field or meeting with your merit badge counselor, having a buddy will help ensure everyone's safety. You and your buddy can watch out for each other wherever you may be or whatever you may be doing.

6. **Expedition Planning.** Discuss with your counselor each of the following steps for conducting a successful exploration activity. Explain the need for each step.
 - a. Identify the objectives (establish goals).
 - b. Plan the mission. Create an expedition agenda or schedule. List potential documents or permits needed.
 - c. Budget and plan for adequate financial resources. Estimate costs for travel, equipment, accommodations, meals, permits or licenses, and other expedition expenses.
 - d. Determine equipment and supplies required for personal and mission needs for the length of the expedition.
 - e. Determine communication and transportation needs. Plan how to keep in contact with your base or the outside world, and determine how you will communicate with each other on-site.
 - f. Establish safety and first aid procedures (including planning for medical evacuation). Identify the hazards that explorers could encounter on the expedition, and establish procedures to prevent or avoid those hazards.
 - g. Determine team selection. Identify who is essential for the expedition to be successful and what skills are required by the expedition leader.
 - h. Establish detailed recordkeeping (documentation) procedures. Plan the interpretation and sharing of information at the conclusion of the expedition.
7. **Prepare for an Expedition.** With your parent's permission and counselor's approval, prepare for an actual expedition to an area you have not previously explored; the place may be nearby or far away. Do the following:
 - a. Make your preparations under the supervision of a trained expedition leader, expedition planner, or other qualified adult experienced in exploration (such as a school science teacher, museum representative, or qualified instructor).
 - b. Use the steps listed in requirement 6 to guide your preparations. List the items of equipment and supplies you will need. Discuss with your counselor why you chose each item and how it will be of value on the expedition. Determine who should go on the expedition.

- c. Conduct a pre-expedition check, covering the steps in requirement 6, and share the results with your counselor. With your counselor, walk through the Sweet Sixteen of BSA Safety for your expedition. Ensure that all foreseeable hazards for your expedition are adequately addressed.

Expeditions are widely variable. You do not have to climb Mount Everest or go to a jungle to be an explorer. For this merit badge, an expedition should be viewed like a field trip or science project. While you cannot just hike some place and call it an expedition, you can hike to a location and study an aspect that interests you.

The major difference between an expedition and a field science trip is that you (with your counselor's guidance) have to plan everything. You have to formulate objectives and plan an agenda. As needed, you will need to do things like confirm transportation, arrange communication, plan for food and medical supplies, acquire all food and other supplies, construct safety and possible evacuation procedures, manage any adverse events, and prepare a report after the expedition.

Evaluating the effects of a storm on the local forest or nature preserve, the effects of a drought on a field used by birds and mammals, changes in butterfly populations due to loss of wildflower habitat, incursions by invasive plant or animal species, insect diversity, and presence or absence of amphibians or fish are just some of the examples that can be studied and reported. Your imagination is your only limitation.

8. **Go on an Expedition.** Complete the following:
 - a. With your parent's permission and under the supervision of your merit badge counselor or a counselor-approved qualified person, use the planning steps you learned in requirement 6 and the preparations you completed in requirement 7 to personally undertake an actual expedition to an area you have not previously explored.
 - b. Discuss with your counselor what is outdoor ethics and its role in exploration and enjoying the outdoors responsibly.

- c. After you return, compile a report on the results of your expedition and how you accomplished your objective(s). Include a statement of the objectives, note your findings and observations, include photos, note any discoveries, report any problems or adverse events, and have a conclusion (whether you reached your objective or not). The post-expedition report must be at least one page and no more than three; one page can be photos, graphs, or figures.
9. **Career Opportunities.** Identify three career opportunities in exploration. Pick one and explain to your counselor how to prepare for such a career. Discuss what education and training are required, and why this profession might interest you.



Eagle Scout Alex Houston joined this 2014 expedition in Antarctica as part of the National Eagle Scout Association's World Explorer program.

Exploration Resources

Scouting Literature

Boy Scout Handbook; Fieldbook; Archaeology, Astronomy, Aviation, Bird Study, Chemistry, Environmental Science, First Aid, Fish and Wildlife Management, Forestry, Geology, Insect Study, Inventing, Mammal Study, Medicine, Mining in Society, Nature, Nuclear Science, Oceanography, Photography, Plant Science, Reptile and Amphibian Study, Robotics, Scuba Diving, Signs, Signals, and Codes, Soil and Water Conservation, Space Exploration, Veterinary Medicine, Weather, and Wilderness Survival merit badge pamphlets

Visit the Boy Scouts of America's official retail website (with your parent's permission) at <http://www.scoutstuff.org> for a complete listing of all merit badge pamphlets and other helpful Scouting materials and supplies.

Books

- Aronson, Marc, and John W. Glenn. *The World Made New: Why the Age of Exploration Happened and How It Changed the World*. National Geographic Children's Books, 2007.
- Ballard, Robert D., and Rick Archbold. *The Lost Ships of Robert Ballard: An Unforgettable Underwater Tour by the World's Leading Deep-Sea Explorer*. Thunder Bay Press, 2005.
- Dickmann, Nancy. *Exploring Beyond the Solar System*. Rosen Central, 2015.
- Douglas, Ed. *Mountaineers: Great Tales of Bravery and Conquest*. DK Publishing, 2011.
- Hanbury-Tenison, Robin. *The Great Explorers*. Thames & Hudson, 2010.
- . *The Modern Explorers*. Thames & Hudson, 2013.
- . *The Seventy Great Journeys in History*. Thames & Hudson, 2006.
- Knauer, Kelly. *Great Discoveries: Explorations That Changed History*. Time, 2009.
- Lansing, Alfred. *Endurance: Shackleton's Incredible Voyage*. Basic Books, 2014.
- MacLeod, Alasdair. *Explorers: Great Tales of Adventure and Endurance*. DK Publishing, 2010.
- Manyak, Michael J., M.D., Joyce J. Johnson, D.O., and Warren J. Young. *Lizard Bites & Street Riots*. WindRush Publishers, 2014.

Matthews, Rupert. *DK Eyewitness Books: Explorer*. DK Publishing, 2012.

Miller, Ron. *Curiosity's Mission on Mars: Exploring the Red Planet*. 21st Century, 2014.

Porti, Andrea. *Explorers: The Most Exciting Voyages of Discovery—From the African Expeditions to the Lunar Landing*. Firefly Books, 2011.

Ross, Stewart. *Into the Unknown: How Great Explorers Found Their Way by Land, Sea, and Air*. Candlewick, 2014.

Multimedia

Alien Deep with Bob Ballard (DVD). National Geographic, 2012.

Burns, Ken. *Lewis & Clark: The Journey of the Corps of Discovery* (DVD). PBS, 1997.

NASA Videos (various topics), <http://www.nasa.gov/multimedia/videogallery/>

National Geographic Live! *The Explorers: Paul Sereno & Phillip Manning* (DVD), National Geographic, 2008.

Nautilus Live (live streaming). Ocean Exploration Trust, <http://www.nautiluslive.org>

NOVA: The Vikings (DVD). PBS, 2006.
The Polar Explorer (DVD). PBS Home Video, 2012.

Organizations and Websites

American Alpine Club

710 10th St., Suite 100
Golden, CO 80401
Telephone: 303-384-0110
Website:
<http://www.americanalpineclub.org>

American Museum of Natural History

Central Park West at 79th Street
New York, NY 10024-5192
Toll-free telephone: 800-462-8687
Website: <http://www.amnh.org>

The Explorers Club

46 E. 70th Street
New York, NY 10021
Telephone: 212-628-8383
Website: <http://explorers.org>

National Aeronautics and Space Administration

NASA Headquarters
300 E. Street SW, Suite 5R30
Washington, DC 20546
Telephone: 202-358-0001
Website: <http://www.nasa.gov>

National Eagle Scout Association (NESA)

Boy Scouts of America
1325 West Walnut Hill Lane
P.O. Box 152079
Irving, TX 75015-2079
Telephone: 972-580-2000
Website: <http://www.nesa.org>

Visit the NESA website to learn more about its exciting **World Explorers Program** for Eagle Scouts.

National Geographic Society

1145 17th Street NW
Washington, DC 20036-4688
Toll-free telephone: 800-647-5463
Website:
<http://www.nationalgeographic.com/explorers>

National Oceanic and Atmospheric Administration

1401 Constitution Avenue, NW
Room 5128
Washington, DC 20230
Telephone: 301-713-1208
Website: <http://www.noaa.gov>

National Science Foundation

4201 Wilson Blvd.
Arlington, VA 22230
Telephone: 703-292-5111
Website: <http://www.nsf.gov>

Smithsonian Institution

P.O. Box 37012
SI Building, Room 153, MRC 010
Washington, DC 20013-7012
Telephone: 202-633-1000
Website: <http://www.si.edu>

World Wildlife Fund

P.O. Box 97180
Washington, DC 20090-7180
Telephone: 202-293-4800
Website: <http://www.worldwildlife.org>

Acknowledgments

The Boy Scouts of America is extremely grateful to the following individuals who helped develop the Exploration merit badge and pamphlet, and for providing many of the photos herein. We appreciate their time, expertise, and involvement very much.

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Paleoanthropology: Lee R. Berger, Ph.D., Exploration merit badge co-developer; Distinguished Eagle Scout; professor and director, Institute for Human Evolution, University of the Witwatersrand, Johannesburg, South Africa; National Geographic Explorer-in-Residence; Fellow, The Explorers Club

Aerial forensics: Harry Brooks, attorney and aircraft accident investigator; former U.S. Marine fighter pilot; Fellow, The Explorers Club

Aerospace: Scott Parazynski, M.D., Distinguished Eagle Scout; astronaut with seven space shuttle flights and five space walks, and the only astronaut who has both flown in space and summited Mount Everest; Fellow, The Explorers Club

Anthropology: Andrew Harvey, Ph.D., linguist, The George Washington University; Fellow, The Explorers Club; William Thomas, Ph.D., director, New Jersey School of Conservation; noted for ethno-ecology, conservation, and traditional ecological wisdom of indigenous peoples; Lowell Thomas Awardee and Fellow, The Explorers Club

Archaeology: Kathryn Ranhorn, Ph.D., Paleolithic archaeologist, The George Washington University; Fellow, The Explorers Club

Dive medicine: R. Craig Cook, M.D., dive medicine specialist and explorer, specializing in pristine seas; medical director, *Sport Diver* magazine

Diving technology: D. Karin Lynn, captain, Civil Engineer Corps, U.S. Navy (retired); trustee and member, Women Divers Hall of Fame; Fellow, The Explorers Club