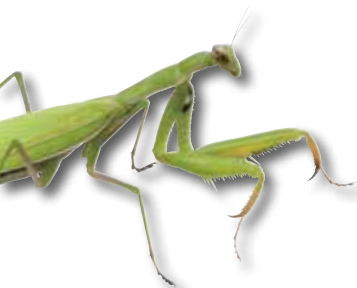
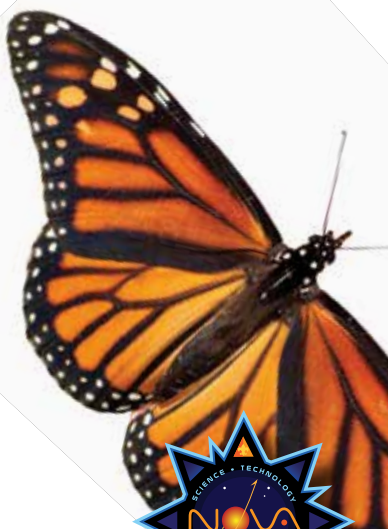


MERIT BADGE SERIES



INSECT STUDY



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Insect Study

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.
2. Tell how insects are different from all other animals. Show how insects are different from centipedes and spiders.
3. Point out and name the main parts of an insect.
4. Describe the characteristics that distinguish the principal families and orders of insects.
5. Do the following:
 - (a) Observe 20 different live species of insects in their habitat. In your observations, include at least four orders of insects.
 - (b) Make a scrapbook of the 20 insects you observe in 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.
6. Do the following:
 - (a) From your scrapbook collection, identify three species of insects helpful to humans and five species of insects harmful to humans.
 - (b) Discuss the use of integrated pest management vs. chemical methods of insect control. What are the advantages and disadvantages of each?
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.

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).*
10. Do ONE of the following:
 - (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.
 - (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.
11. Tell things that make social insects different from solitary insects.
12. Tell how insects fit in the food chains of other insects, fish, birds, and mammals.
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.

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

Insect Study Resources

Scouting Literature

Slugs and Bugs pocket guide; *Animal Science*, *Bird Study*, *Collections*, *Environmental Science*, *Forestry*, *Gardening*, *Mammal Study*, *Medicine*, *Nature*, *Plant Science*, *Public Health*, *Reptile and Amphibian Study*, *Soil and Water Conservation*, and *Veterinary Medicine* merit badge pamphlets

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

Books and Brochures

- Arnett Jr., Ross H. *American Insects: A Handbook of the Insects of America North of Mexico*, 2nd ed. CRC Press, 2000.
- Arnett Jr., Ross H., and Richard L. Jacques Jr. *Simon and Schuster's Guide to Insects*, 2nd ed. Fireside Books, 1981.
- Berenbaum, May R. *Ninety-Nine Gnats, Nits, and Nibblers*. University of Illinois Press, 1989.
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- Bland, Roger G., et al. *How to Know the Insects*. McGraw-Hill, 1978.
- Chu, H.F., and Laurence K. Cutkomp. *How to Know the Immature Insects*. McGraw-Hill, 1992.
- Dashefsky, H. Steven. *Insect Biology: 49 Science Fair Projects*. Tab Books, 1992.
- Dunkle, Sidney W. *Dragonflies Through Binoculars: A Field Guide to Dragonflies of North America*. Oxford University Press, 2000.
- Eisner, Thomas. *For Love of Insects*, 2nd ed. Belknap Press, 2005.
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- Evans, Howard E. *The Pleasures of Entomology*. Smithsonian, 1985.
- Holldobler, Bert, and Edward O. Wilson. *The Ants*. Belknap Press, 1990.
- Lehmkuhl, Dennis M., et al. *How to Know the Aquatic Insects*. McGraw-Hill, 1979.

- Milne, Lorus J. *National Audubon Society Field Guide to North American Insects and Spiders*. Knopf, 1980.
- Mound, Laurence, and Stephen Brooks. *Insects*. Sagebrush, 2003.
- National Audubon Society. *National Audubon Society Field Guide to North American Butterflies*. Chanticleer Press, 1981.
- Opler, Paul A. *Peterson First Guides: Butterflies and Moths*. Houghton Mifflin, 1998.
- Peterson, Roger Tory. *Peterson First Guides: Insects*, 2nd rev. ed. Houghton Mifflin, 1998.
- Turpin, Tom. *Insect Appreciation*, 3rd ed. Kendall Hunt Publishing Co., 2002.
- West, Larry, and Julie Ridl. *How to Photograph Insects and Spiders*. Stackpole Books, 1994.
- White, Richard E. *A Field Guide to the Beetles of North America*. Houghton Mifflin, 1998.
- Wilsdon, Christina, et al. *National Audubon Society First Field Guide: Insects*. Scholastic, 1998.
- Winston, Mark L. *The Biology of the Honey Bee*. Harvard University Press, 1991.
- Wright, Amy Bartlett. *Peterson First Guides: Caterpillars*. Houghton Mifflin, 1998.
- Zim, Herbert S. *Insects*, rev. and updated ed. St. Martin's Press, 2001.

Organizations and Websites

American Beekeeping Federation

Telephone: 404-760-2875

Website: <http://www.abfnet.org>

American Entomological Society

Telephone: 215-561-3978

Website:

<http://www.ansp.org/hosted/aes/index.html>

Bee Culture

Toll-free telephone: 800-289-7668

Website: <http://www.beeculture.com>

BugGuide.net

Telephone: 515-294-7400

Website: <http://www.bugguide.net>

Carolina Biological Supply Company

Toll-free telephone: 800-334-5551

Website: <http://www.carolina.com>

Entomological Foundation

Telephone: 608-232-1410

Website: <http://www.entfdn.org>

Entomological Society of America

Telephone: 301-731-4535

Website: <http://www.entsoc.org>

Monarch Watch

Toll-free telephone: 888-TAGGING

Website: <http://www.monarchwatch.org>

National Museum of Natural History

Department of Entomology

P.O. Box 37012, Smithsonian Institution

Washington, DC 20013-7012

Website: <http://entomology.si.edu>