

Aviation Merit Badge

For most of history, people have dreamed of flying, imagining how it would feel to soar through the sky like an eagle or hover in midair like a hummingbird, to float on unseen currents, free of Earth's constant tug, able to travel great distances and to rise above any obstacle. Today, through aviation, we can not only join the birds but also fly farther, faster, and higher than they ever could.

Requirements

1. Do the following:
 - a. Define "aircraft." Describe some kinds and uses of aircraft today. Explain the operation of piston, turboprop, and jet engines.
 - b. Point out on a model airplane the forces that act on an airplane in flight.
 - c. Explain how an airfoil generates lift, how the primary control surfaces (ailerons, elevators, and rudder) affect the airplane's attitude, and how a propeller produces thrust.
 - d. Demonstrate how the control surfaces of an airplane are used for takeoff, straight climb, level turn, climbing turn, descending turn, straight descent, and landing.
 - e. Explain the following: the recreational pilot and the private pilot certificates; the instrument rating.
2. Do TWO of the following:
 - a. Take a flight in an aircraft, with your parent's permission. Record the date, place, type of aircraft, and duration of flight, and report on your impressions of the flight.
 - b. Under supervision, perform a preflight inspection of a light airplane.
 - c. Obtain and learn how to read an aeronautical chart. Measure a true course on the chart. Correct it for magnetic variation, compass deviation, and wind drift. Arrive at a compass heading.
 - d. Using one of many flight simulator software packages available for computers, "fly" the course and heading you established in requirement 2c or another course you have plotted.
 - e. On a map, mark a route for an imaginary airline trip to at least three different locations. Start from the commercial airport nearest your home. From timetables (obtained from agents or online from a computer, with your parent's permission), decide when you will get to and leave from all connecting points. Create an aviation flight plan and itinerary for each destination.
 - f. Explain the purposes and functions of the various instruments found in a typical single-engine aircraft: attitude indicator, heading indicator, altimeter, airspeed indicator, turn and bank indicator, vertical speed indicator, compass, navigation (GPS and VOR) and communication radios, tachometer, oil pressure gauge, and oil temperature gauge.
 - g. Create an original poster of an aircraft instrument panel. Include and identify the instruments and radios discussed in requirement 2f.
3. Do ONE of the following:
 - a. Build and fly a fuel-driven or battery-powered electric model airplane. Describe safety rules for building and flying model airplanes. Tell safety rules for use of glue, paint, dope, plastics, fuel, and battery pack.
 - b. Build a model FPG-9. Get others in your troop or patrol to make their own model, then organize a competition to test the precision of flight and landing of the models.
4. Do ONE of the following:
 - a. Visit an airport. After the visit, report on how the facilities are used, how runways are numbered, and how runways are determined to be "active."
 - b. Visit a Federal Aviation Administration facility—a control tower, terminal radar control facility, air route traffic control center, flight service station, or Flight Standards District Office. (Phone directory listings are under U.S. Government Offices, Transportation Department, Federal Aviation Administration. Call in advance.) Report on the operation and your impressions of the facility.
 - c. Visit an aviation museum or attend an air show. Report on your impressions of the museum or show.
5. Find out about three career opportunities in aviation. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.



Aviation
BSA Supply No. 35862

Resources

Scouting Literature

Auto Mechanics, Electronics, Engineering, Model Design and Building, Orienteering, and Space Exploration merit badge pamphlets

Books

- Echaore-McDavid, Susan. *Career Opportunities in Aviation and the Aerospace Industry: A Guide to 80 Careers in Aviation and the Aerospace Industry*. Checkmark Books, 2005.
- Eichenberger, Jerry A. *Your Pilot's License*. McGraw Hill, 1999.
- Goldstein, Avram. *The Right Seat: An Introduction for Would-Be Pilots*. AirGuide Publications, 1996.
- Gunston, Bill. *Aviation: The First 100 Years*. Barron's, 2002.
- Lopez, Donald S. *Aviation: A Smithsonian Guide*. Macmillan, 1995.
- Nahum, Andrew. *Flying Machine*. DK Publishers, 2004.
- Rabinowitz, Harold. *Conquer the Sky: Great Moments in Aviation*. Metro Books, 1996.

Periodicals

Flying HFM Inc. 1633 Broadway, 45th Floor New York, NY 10019 Telephone: 212-767-6000 Web site:
<http://www.flyingmagazine.com>

Model Airplane News Air Age Media 100 East Ridge Ridgefield, CT 06877-4606 Toll-free telephone: 800-877-5169 Web site:
<http://www.modelairplanenews.com>

Plane & Pilot Werner Publishing Corp. 12121 Wilshire Blvd., 12th Floor Los Angeles, CA 90025-1176 Telephone: 310-820-1500
 Web site: <http://www.planeandpilotmag.com>

Organizations and Web Sites

Academy of Model Aeronautics 5161 East Memorial Drive Muncie, IN 47302 Toll-free telephone: 800-435-9262 Web site:
<http://www.modelaircraft.org>

ALLSTAR Network Aeronautics Learning Laboratory for Science, Technology, and Research Web site:
<http://www.allstar.fiu.edu>

The Aviation History Online Museum Web site: <http://www.aviation-history.com>

AvStop Magazine Online Web site: <http://www.avstop.com>

Chasing the Sun The History of Commercial Aviation Seen through the Eyes of Its Innovators Web site:
<http://www.pbs.org/kcet/chasingthesun>

Federal Aviation Administration 800 Independence Ave. SW Washington, DC 20591 Toll-free telephone: 866-835-5322 Web site:
<http://www.faa.gov>

Flight-History.com Web site: <http://www.flight-history.com>

National Aeronautics and Space Administration Suite 1M32 Washington, DC 20546-0001 Telephone: 202-358-0001 Web site:
<http://www.nasa.gov>

National Oceanic and Atmospheric Administration 14th Street and Constitution Avenue, NW Room 6217 Washington, DC 20230
 Telephone: 202-482-6090 Web site: <http://www.noaa.gov>

University Aviation Association 3410 Skyway Drive Auburn, AL 36830-6444 Telephone: 334-844-2434 Web site:
<http://uaa.auburn.edu>

Videos and DVDs

- *Sporty's Airships*. VHS, 50 min.
- *Larry Bartlett's Flying the Alaska Highway*. VHS, 75 min.
- *Wonderful World of Flying's Have Plane, Will Travel*. VHS, 70 min.
- *Sporty's Learning to Fly*. VHS, 55 min.
- *Sporty's Non-Flier's Guide to the Cockpit*. VHS, 75 min.
- *Sporty's So You Want to Fly Helicopters?* VHS, 110 min.