



Aviation

Merit Badge Workbook

This workbook can help you but you still need to read the merit badge pamphlet (book). No one can add or subtract from the Boy Scout Requirements #33215. Merit Badge Workbooks and much more are below: [Online Resources](#).

Send comments to: craig@craiglincoln.com. Requirements revised: 2006, Workbook updated: February 2008.

Scout's Name: _____ Unit: _____

Counselor's Name: _____ Counselor's Ph #: _____

1. Do the following:

a. Define "aircraft." _____

Describe some kinds and uses of aircraft today.

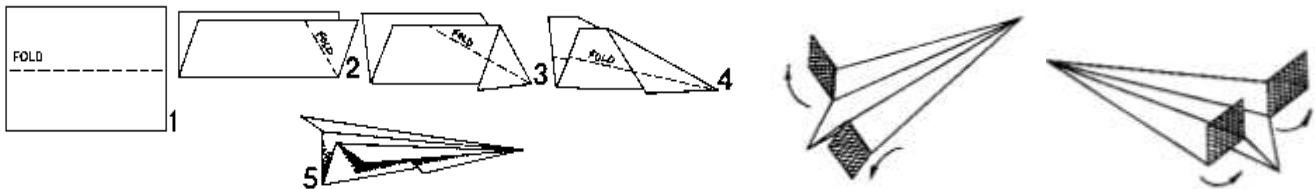
Kind:	Uses:
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Explain the operation of piston, _____

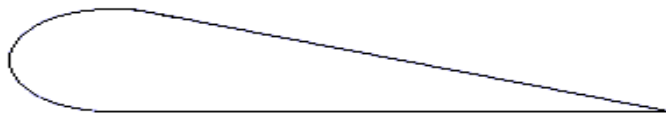
turboprop, _____

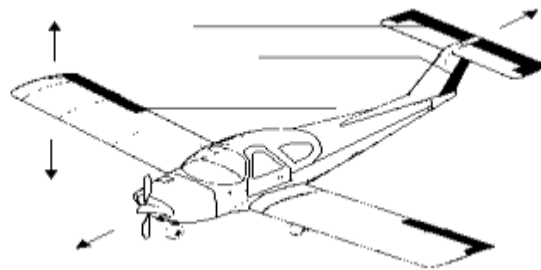
and jet engines. _____

b. Point out on a model airplane the forces that act on an airplane in flight. (Hint: To make a model airplane out of paper...)



c. Explain how an airfoil generates lift,





how the primary control surfaces (ailerons, elevators, and rudder) affect the airplane's attitude,

Ailerons: _____

Elevators: _____

Rudder: _____

and how a propeller produces thrust. _____

d. *Demonstrate* how the control surfaces of an airplane are used for

	Ailerons	Elevators	Rudder	Flaps
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.



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.

Depart	Flight Time	Arrive	Time	Depart	Flight Time	Arrive	Time
1 _____	_____	_____	_____	4 _____	_____	_____	_____
2 _____	_____	_____	_____	5 _____	_____	_____	_____
3 _____	_____	_____	_____	6 _____	_____	_____	_____

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, and 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. _____

Online Resources (Use any Internet resource with caution and only with your parent's or guardian's permission.)

Merit Badge Workbooks: usscouts.org -or- merithub.org ▶ Merit Badge Books: www.scoutstuff.org

Boy Scouts of America: <http://www.scouting.org/> ▶ [Requirements](#) ▶ [Intro to Merit Badges](#) ▶ [Guide to Safe Scouting](#)

Online Videos: <http://www.expertvillage.com/>

 [Type of Planes](#)  [Exterior](#)  [Interior](#)  [Pre-flight](#)  [Taking Off](#)  [Flying](#)  [Landing](#)  [more...](#)

Academy of Model Aeronautics: <http://www.modelaircraft.org>

ALLSTAR Network Aeronautics Learning Laboratory: <http://www.allstar.fiu.edu>

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

AvStop Magazine <http://www.avstop.com>

Federal Aviation Administration: <http://www.faa.gov>

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

National Aeronautics and Space Administration: <http://www.nasa.gov>

National Oceanic and Atmospheric Administration: <http://www.noaa.gov>

University Aviation Association: <http://uaa.auburn.edu>