

# Aviation

## Merit Badge Workbook



This workbook can help you but you still need to read the merit badge pamphlet. This Workbook can help you organize your thoughts as you prepare to meet with your merit badge counselor

#### Merit Badge Counselors may not require the use of this or any similar workbooks.

You still must satisfy your counselor that you can demonstrate each skill and have learned the information. You should use the work space provided for each requirement to keep track of which requirements have been completed, and to make notes for discussing the item with your counselor, not for providing full and complete answers. If a requirement says that you must take an action using words such as "discuss", "show", "tell", "explain", "demonstrate", "identify", etc, that is what you must do. No one may add or subtract from the official requirements found on Scouting.org. The requirements were last issued or revised in 2014 • This workbook was updated in November 2023.

Scout's Name:	UnitDate Started	
Counselor's Name:	Phone No.:	Email:

Please submit errors, omissions, comments or suggestions about this <u>workbook</u> to: <u>Workbooks@USScouts.Org</u> Comments or suggestions for changes to the <u>requirements</u> for the <u>merit badge</u> should be sent to: <u>Merit.Badge@Scouting.Org</u>

### 1. Do the following:

a. Define "aircraft."

Describe some kinds and uses of aircraft today.

Kind:	Uses:	

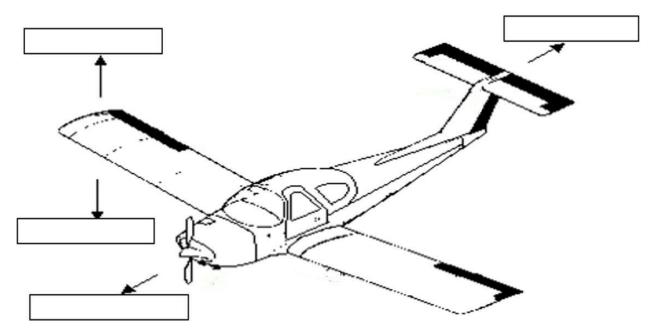
Workbook © Copyright 2023 - U.S. Scouting Service Project, Inc. - All Rights Reserved Requirements © Copyright, Boy Scouts of America (Used with permission.)

This workbook may be reproduced and used locally by Scouts and Scouters for purposes consistent with the programs of the Boy Scouts of America (BSA), the World Organization of the Scout Movement (WOSM) or other Scouting and Guiding Organizations. However it may NOT be used or reproduced for electronic redistribution or for commercial or other non-Scouting purposes without the express permission of the U. S. Scouting Service Project, Inc. (USSSP).

Explain the operation of piston, turboprop, and jet engines.

Piston:	
Turboprop:	
Jet:	

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.

Airfoil:	
Ailerons:	
Elevators:	
Rudder:	
Propeller:	

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.

		Ailerons	Elevators	Rudder	Flaps
	Takeoff				
	Straight climb				
	Level turn				
	Climbing turn				
	Descending turn				
	Straight descent				
	Landing				
e.	Explain the follo	owing: the sport pilot, the	recreational pilot and the pri	vate pilot certificates; the i	instrument rating.
	Sport pilot certificate				
	certificate				
	Descritions				
	Recreational pi certificate:				
	Private pilot certificate:				
	certificate:				

2.

Ins	trument rating:		
Do TWO of the following:			
00111			
a.	Take a flight in a	an aircraft with your parent or guardian's permission. Record the date, place, type of aircraft, and , and report on your impressions of the flight.	
_	Take a flight in a	an aircraft with your parent or guardian's permission. Record the date, place, type of aircraft, and	
_	Take a flight in a duration of flight	an aircraft with your parent or guardian's permission. Record the date, place, type of aircraft, and	
_	Take a flight in a duration of flight Date:	an aircraft with your parent or guardian's permission. Record the date, place, type of aircraft, and , and report on your impressions of the flight.	
_	Take a flight in a duration of flight Date: Place:	an aircraft with your parent or guardian's permission. Record the date, place, type of aircraft, and , and report on your impressions of the flight.	
_	Take a flight in a duration of flight Date: Place: Type of aircraft:	an aircraft with your parent or guardian's permission. Record the date, place, type of aircraft, and , and report on your impressions of the flight.	

	b.	Under su	pervision.	perform a	prefliaht in	spection of	a light airplane	).
- L					P. P. S.			-

- 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.
- Explain the purposes and functions of the various instruments found in a typical single-engine aircraft: attitude Пе. indicator, heading indicator, altimeter, airspeed indicator, turn and bank indicator, vertical speed indicator, compass, navigation (GPS and VOR) communication radios, tachometer, oil pressure gauge, and oil temperature gauge.

Attitude indicator:	
Heading indicator:	

Altimeter:	
Airspeed indicator:	
indicator:	
Turn and bank	
indicator:	
Vertical speed indicator:	
mulcator.	
Compass:	
Navigation (GPS and VOR):	
VOR):	
0	
Communication radios:	
Tachometer:	
rachometer.	

3.

4.

	Oil pressure gauge:	
	Oil temperature gauge:	
	in requirement 2e.	poster of an aircraft instrument panel. Include and identify the instruments and radios discussed
	of the following:	drives as hottom, neveral electric second la similar s
		driven or battery powered electric model airplane. es for building and flying model airplanes.
	Tell safety rules for	use of glue, paint, dope, plastics, fuel, and battery pack.
		9. Get others in your troop or patrol to make their own model, then organize a competition to flight and landing of the models.
	of the following:	5 5
🗌 а.	-	er the visit, report on how the facilities are used, how runways are numbered, and how runways be "active."
	How the facilities are used	

	How runways are numbered,		
	How runways are determined to be "active."		
☐ b.	center, or Flight Star Transportation Depa	I ion Administration facility - a control tower, terminal radar control facility, air route traffic control ndards District Office. (Phone directory listings are under U.S. Government Offices, artment, and Federal Aviation Administration. Call in advance.) tion and your impressions of the facility.	
	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.

1.	
2.	
3.	
Pick one and	find out the education, training, and experience required for this profession.
Education:	
Training:	
0	
Experience:	
Discuss this v	l with your counselor, and explain why this profession might interest you.

When working on merit badges, Scouts and Scouters should be aware of some vital information in the current edition of the *Guide to Advancement* (BSA publication 33088).Important excerpts from that publication can be downloaded from <a href="http://usscouts.org/advance/docs/GTA-Excerpts-meritbadges.pdf">http://usscouts.org/advance/docs/GTA-Excerpts from that publication can be downloaded from <a href="http://usscouts.org/advance/docs/GTA-Excerpts-meritbadges.pdf">http://usscouts.org/advance/docs/GTA-Excerpts from that publication can be downloaded from <a href="http://usscouts.org/advance/docs/GTA-Excerpts-meritbadges.pdf">http://usscouts.org/advance/docs/GTA-Excerpts-meritbadges.pdf</a>. You can download a complete copy of the *Guide to Advancement* from <a href="http://www.scouting.org/filestore/pdf/33088.pdf">http://www.scouting.org/filestore/pdf/33088.pdf</a>.