



# Aviation

## Merit Badge Workbook

This workbook can help you but you still need to read the merit badge pamphlet.

The work space provided for each requirement should be used by the Scout to make notes for discussing the item with his counselor, not for providing the full and complete answers. Each Scout must do each requirement.

No one may add or subtract from the official requirements found in Boy Scout Requirements (Pub. 33216 – SKU 34765).

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

1. Do the following:

- a. Define “aircraft.” An aircraft is a \_\_\_\_\_ than enables people (or cargo) to fly through the air.

From the pictures below, describe the type of aircraft and its possible uses:



\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_

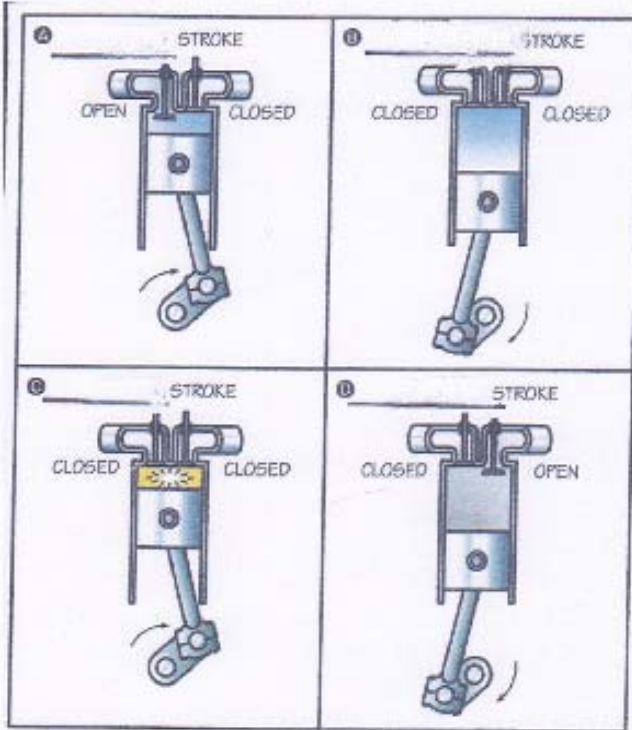


\_\_\_\_\_



\_\_\_\_\_

1. a. i. Describe and label the following aircraft engines:



1 a ii. Describe and label the following aircraft engines:

\_\_\_\_\_ engine.

A) \_\_\_\_\_ stroke.

B) \_\_\_\_\_

C) \_\_\_\_\_ stroke.

D) \_\_\_\_\_ stroke

\_\_\_\_\_ engine

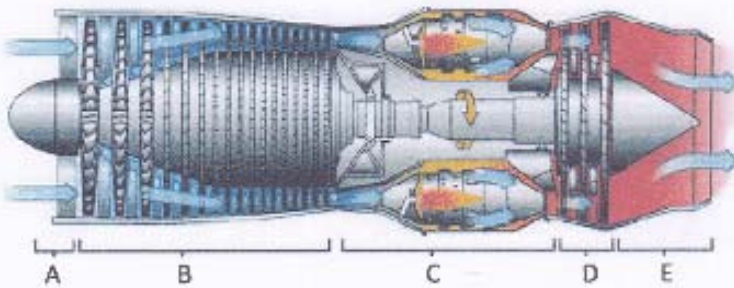
A) \_\_\_\_\_ inlet

B) \_\_\_\_\_

C) \_\_\_\_\_ chamber

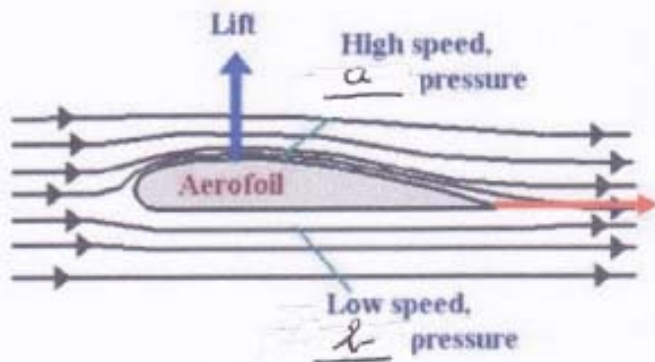
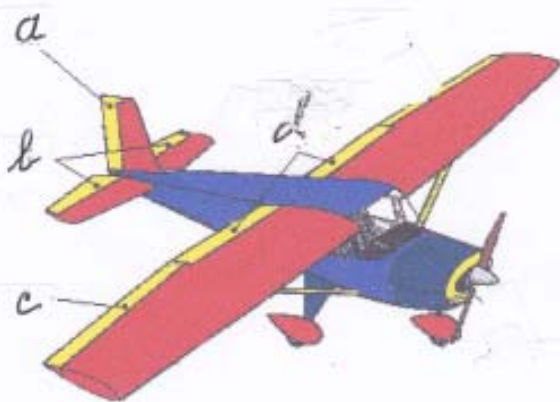
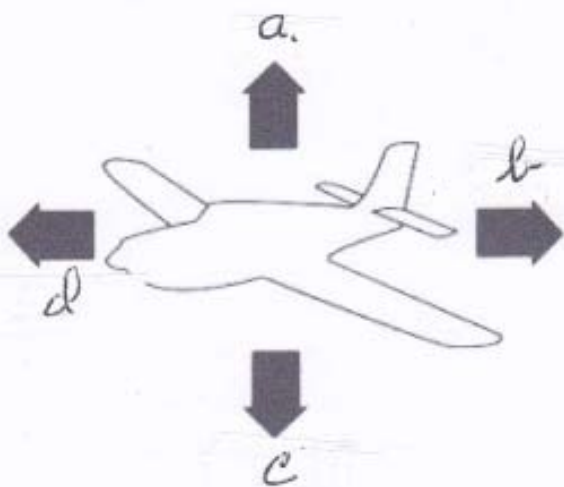
D) \_\_\_\_\_

E) \_\_\_\_\_



\_\_\_\_\_ This jet engine has a separate portion of compressor blades that bypasses the combustions chamber providing greater thrust for its weight.

\_\_\_\_\_ This variation of the turbojet engine turns a propeller. This combination allows aircraft to land and takeoff on shorter airfields.



1 B. Point out on a model airplane the forces that act on an airplane in flight.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_

1 C. Explain how an airfoil generates lift, how the primary control surfaces affect the airplane's attitude, and how a propeller produces thrust.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_

How an airfoil produces lift

- a. \_\_\_\_\_
- b. \_\_\_\_\_

**1 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.**

	<b>Ailerons</b>	<b>Elevators</b>	<b>Rudder</b>	<b>Flaps</b>
Takeoff	Lf up neutral Rt up	Up Neutral Down	Left neutral right	Down Retracted
Straight Climb	Lf up neutral Rt up	Up Neutral Down	Left neutral right	Down Retracted
Right Level Turn	Lf up neutral Rt up	Up Neutral Down	Left neutral right	Down Retracted
Left Climbing Turn	Lf up neutral Rt up	Up Neutral Down	Left neutral right	Down Retracted
Left Descending turn	Lf up neutral Rt up	Up Neutral Down	Left neutral right	Down Retracted
Straight descent	Lf up neutral Rt up	Up Neutral Down	Left neutral right	Down Retracted
Landing	Lf up neutral Rt up	Up Neutral Down	Left neutral right	Down Retracted

**1 E. Explain the following: the sport pilot, the recreational pilot, and the private pilot certificates; the instrument rating:**

<b>Certificate/Rating</b>	<b>Minimum hours</b>	<b>Number of Passengers</b>	<b>Visibility VFR/IFR</b>	<b>Flight Max Distance</b>	<b>Night Flights</b>	<b>Fly for Hire</b>
<b>Sport Pilot Certificate</b>						
<b>Recreational Pilot Certificate</b>						
<b>Private Pilot Certificate</b>						
<b>Instrument Pilot Rating</b>						

**2. Do the following:**

**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 to determine a compass heading.**

From \_\_\_\_\_ to \_\_\_\_\_ the true course is: \_\_\_\_\_<sup>0</sup>

Correct for wind drift + / - \_\_\_\_\_<sup>0</sup> Gives you a True Heading of \_\_\_\_\_<sup>0</sup>

Correct for variation + / - \_\_\_\_\_<sup>0</sup> Gives you a Magnetic Heading of \_\_\_\_\_<sup>0</sup>

Correct for compass deviation + / - \_\_\_\_\_<sup>0</sup> Gives you a Compass Heading of \_\_\_\_\_<sup>0</sup>

3. Do the following:

- 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 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." \_\_\_\_\_

How the facilities are used \_\_\_\_\_

\_\_\_\_\_

How runways are numbered, \_\_\_\_\_

\_\_\_\_\_

How runways are determined to be "active." \_\_\_\_\_

\_\_\_\_\_

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: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Experience: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Discuss this with your counselor, and explain why this profession might interest you. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Requirement resources can be found here:**

[http://www.meritbadge.org/wiki/index.php/Aviation#Requirement\\_resources](http://www.meritbadge.org/wiki/index.php/Aviation#Requirement_resources)