



GLEIM

Aviation Merit Badge Workbook



Scout's Name:

Troop:

Counselor's Name:

Date:



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The most efficient method to achieve the Aviation Merit Badge can be achieved by making use of Gleim *Learn to Fly* in the highlighted requirements below.

1. Do the following:

- a. Define ‘aircraft’. Describe some kinds and uses of aircraft today. Explain the operation of piston, turboprop, and jet engines.

Learn to Fly Part 3 Section 3.2 Describes all categories and classes of aircraft.

Aircraft - definition	
Kinds of Aircraft	Uses
Engines Types	Operation
Piston	
Turboprop	
Jet	

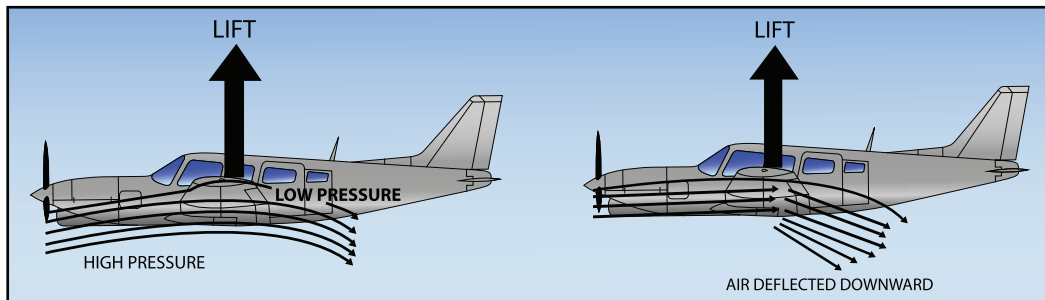
- b. Point out on a model airplane the forces that act on an airplane in flight.

Learn to Fly Part 3 Explains how airplanes fly and the forces acting upon them.

- 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.

Learn to Fly Part 3 Section 3.1 Defines how wings generate lift.

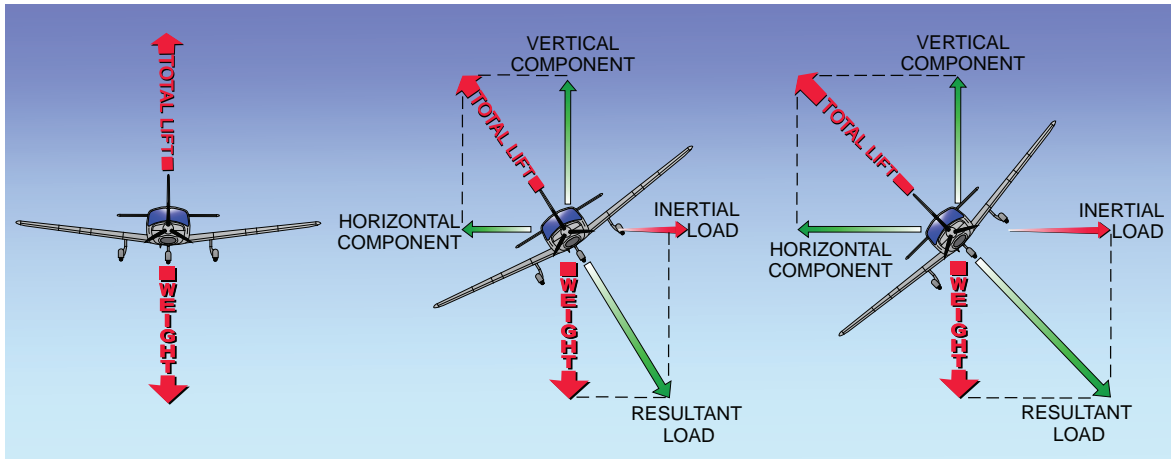
Learn to Fly Part 3 Section 3.5 Explains flight controls and control surfaces.



Airfoil generates lift	
Ailerons, elevators, and rudder affect attitude	
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

Learn to Fly Part 3 Section 3.5 Explains flight controls and control surfaces.
Learn to Fly Part 3 Section 3.6 Describes and show how airplanes turn.



	Ailerons	Elevator	Rudder	Flaps
Takeoff				
Straight climb				
Level turn				
Climbing turn				
Descending turn				
Straight descent				
Landing				

e. Explain the following: the recreational pilot and the private pilot certificates; the instrument rating.

Learn to Fly Part 1 Describes in detail the Sport and Private Pilot Certificate and requirements.
Learn to Fly Part 5 Section 5.1 Outlines how pilots can add an Instrument Rating to their certificate.

Sport Pilot	
Private Pilot	
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.

Gleim Airport Search Tool will help you find and contact your nearest airport.

Date		Airport	
Flight duration		Aircraft	
Impressions			

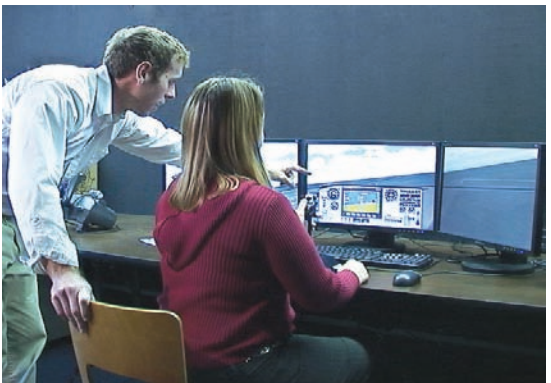
- b.** Under supervision, perform a preflight inspection of a light aircraft.



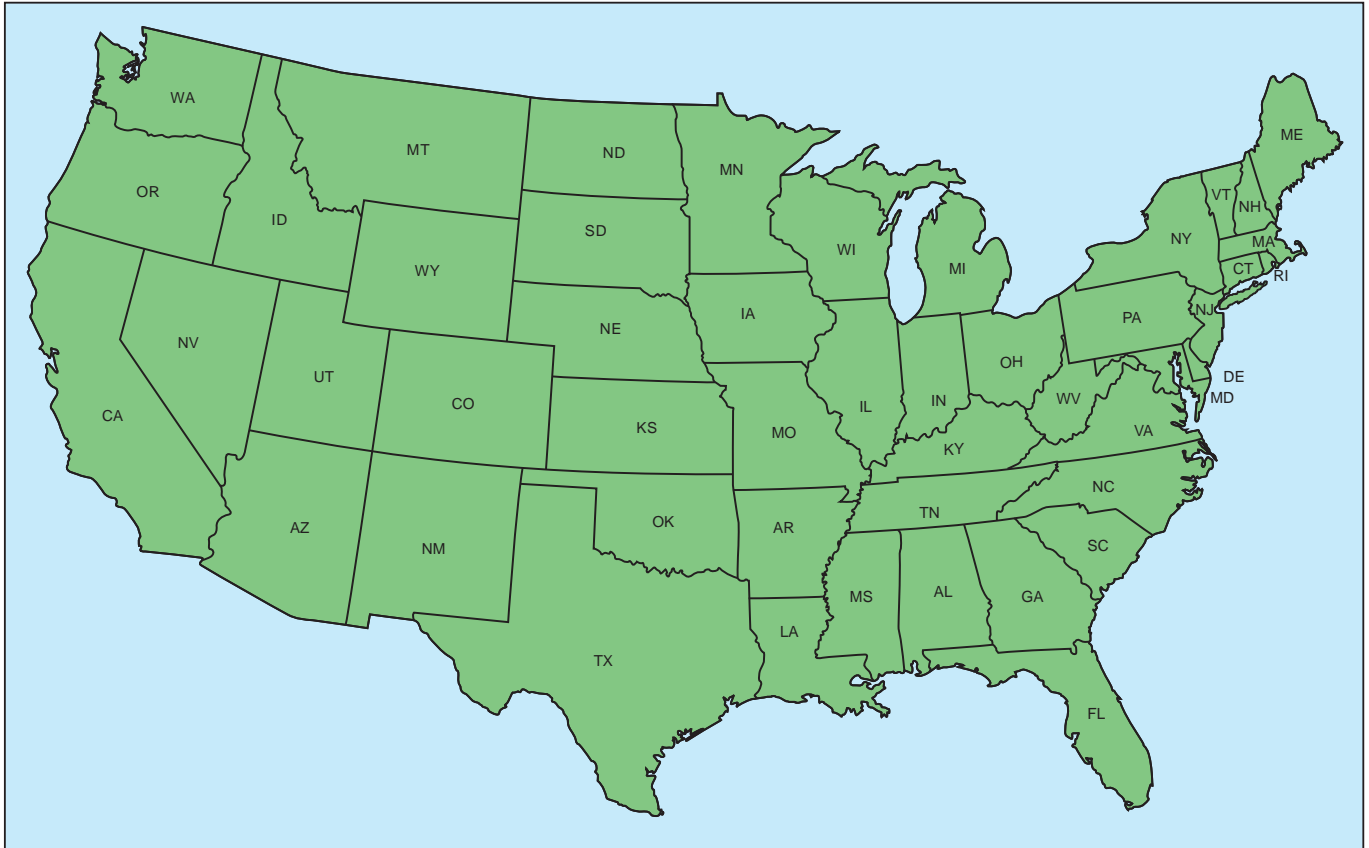
- c.** Obtain and learn how to read an aeronautical chart. Measure a true course on the chart. Correct for magnetic variation, compass deviation, and wind drift. Arrive at a compass heading.

True course (Use your Gleim Navigational Plotter)	
Correct for magnetic variation	
Compass deviation (Ask the flight instructor where this is found on the airplane)	
Wind drift (Use current wind at the airport you visit)	
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.



Departure from	Flight #	Time	Arriving at	Time

f. Explain the purposes and functions of the various instruments found in a typical single-engine aircraft.

Learn to Fly Part 3 Section 3.3 & 3.5 Outlines the purpose and use of each instrument.

Instrument	Purpose	Use
Attitude Indicator 		
Heading Indicator 		
Altimeter 		
Airspeed Indicator 		
Turn Indicator 		
Vertical Speed Indicator (VSI) 		
Compass 		
Navigation Radios (GPS or VOR) 		
Communication Radios 		
Tachometer 		
Oil Pressure Gauge 		
Oil Temperature Gauge 		

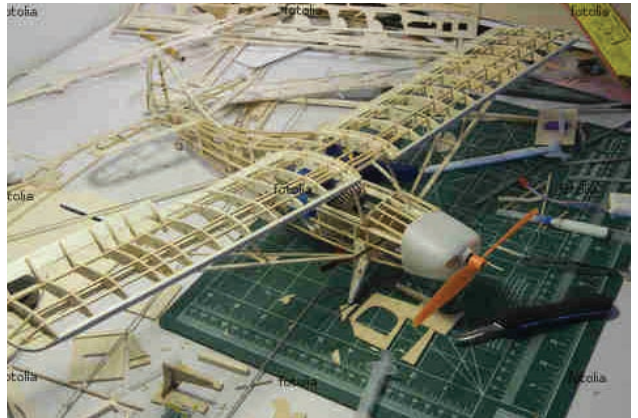
g. Create an original poster of an aircraft instrument panel. Include and identify the instruments and radios discussed in requirement 2f.

Learn to Fly Part 3 Section 3.3 Use this as an example.



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 packs.



- 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. (See next page for pattern.)

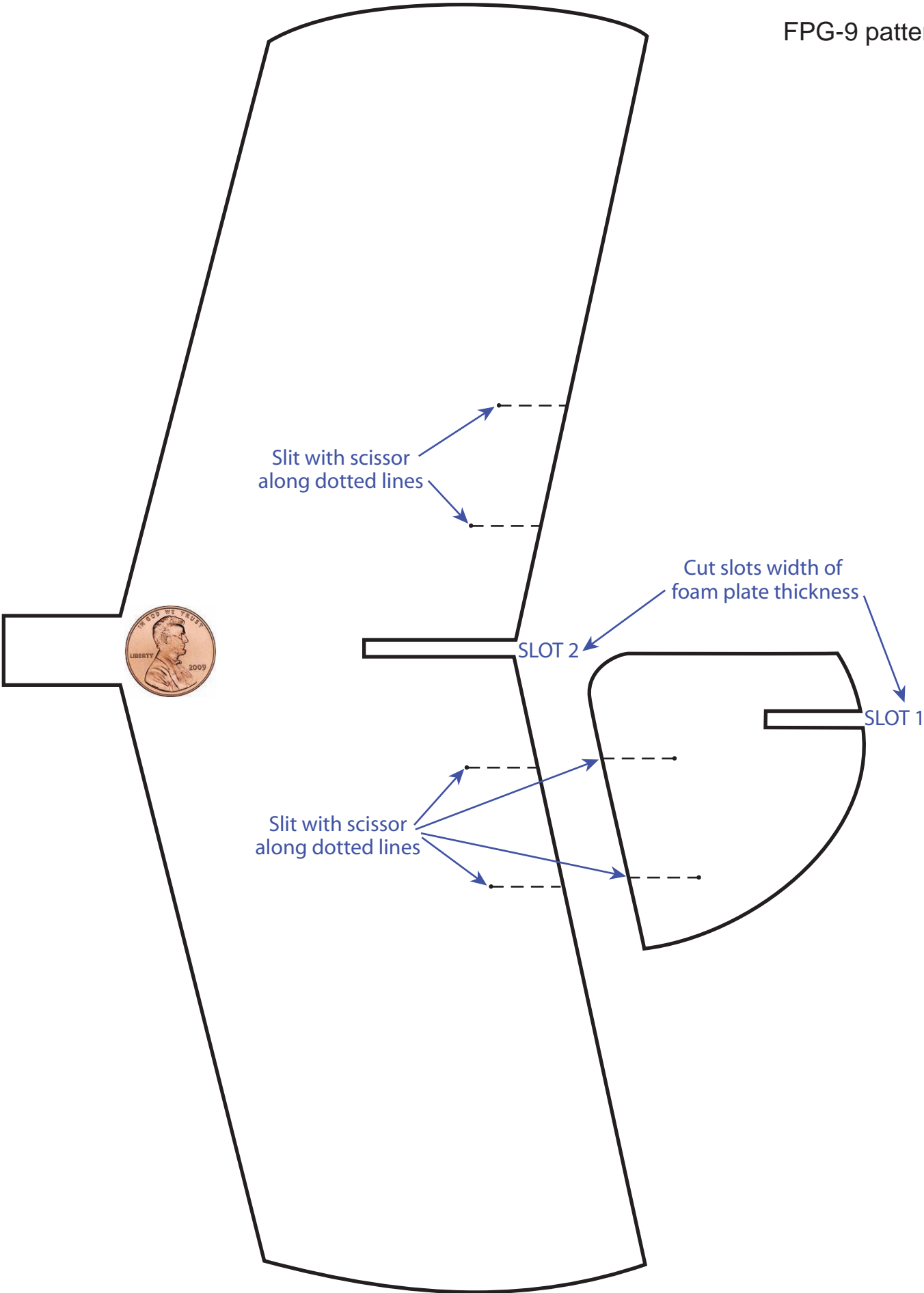
Materials needed:

- FPG-9 pattern
- 9" foam plate
- Scissors
- Clear tape
- Ink pen
- Penny

Instructions:

1. Cut out pattern on next page.
2. Trace pattern onto foam plate. The wings should extend onto the curved edge of the plate. Make sure the tail is on flat part of plate.
3. Cut slots only the thickness of the plate to ensure that it fits snugly when put together.
4. Attach the wings to the tail by sliding Slot 1 into Slot 2. On the bottom, tape tail to wings perpendicular to each other.
5. Attach penny onto wings as shown. Fold tab back over penny and tape down to secure.
6. Bend elevons on wing upward to ensure a flatter glide. Adjust the rudder on the tail fin to make the plane turn.
7. Gently toss the plane directly in front of you. Once it flies reasonably straight ahead and glides well, try throwing it hard with the nose of the glider pointed 30° above the horizon. The FPG-9 should perform a big loop and have enough speed for a glide of 20 – 25 feet after the loop.

FPG-9 pattern



4. Do ONE of the following:

- a.** Visit an airport. After the visit, 1) report on how the facilities are used, 2) how runways are numbered, and 3) how runways are determined to be ‘active.’

Gleim Airport Search Tool will help you find and contact your nearest airport.

1)	
2)	
3)	

- 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.

Operations	
Impression	

- c.** Visit an aviation museum or attend an air show. Report on your impressions of the museum or show.

Impression	
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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.

Learn to Fly Part 5 Section 5.2 & 5.3 Describe what it takes to be a Commercial Pilot and a Certified Flight Instructor.

AMT Requirements Page Explains requirements for becoming an Aviation Maintenance Technician and why someone would want to be.

Careers		

Career chosen	
Education required	
Training required	
Experience required	
Reason for interest	

Congratulations! You have achieved your Aviation Merit Badge. But this should not be the end of your interest in aviation. There are many other ways that you can continue to be a part of aviation. For starters, take the **Gleim Watching Airplanes Course**. Here you will learn about airport operations, learn to understand pilot communication, and even listen to actual communications at your home airport!

This course was designed to be used with the **Gleim Aviation Radio Receiver**. This portable, easy-to-use tool will allow you to monitor aircraft and air traffic control communications - allowing you to see and hear the action at your local airport.

As you have seen from Part 1 in the **Learn to Fly** booklet, it is very easy to start and complete your pilot training with Gleim. With our **Online Ground School**, **Private Pilot Kit**, and **Reference Books**, becoming a pilot has never been easier!

Or, for those more interested in the behind the scenes workings of aviation, look at the **Gleim Aviation Maintenance Technician School Directory**. This site will help you find the AMT school nearest you. Here course descriptions, costs, and contact information will be given for you to make an informed choice.

Thank you for choosing Gleim, where we help your aviation dreams get off the ground!