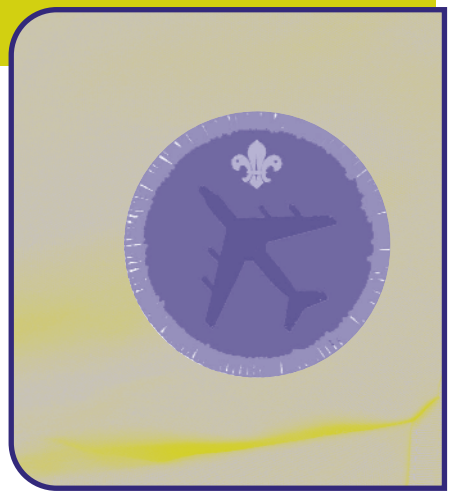
Advanced Aviation Skills



To gain this badge the Explorer Scout must complete all the following requirements.

1. Hold the Advanced Aviation Skills Badge from the Scout Section or the Explorer Scout Aviation Skills Badge.

2. Choose one of the following two activities:

   a. Organise a visit to an airfield and arrange a suitable programme for a group of Scouts, including the necessary briefings.

   b. Either make a video film or take a set of slides on an aviation subject and use it to give a presentation to a group of Scouts.

3. Choose one of the following two activities:

   a. Help a light aircraft pilot in his duties before and after a flight, for example, moving the aircraft, strapping in, starting up and picketing.

   b. Help a glider pilot with ground handling and launching his aircraft, and be able to assist after a field landing.

4. Plan a journey to a destination on the other side of the world of at least three sectors, giving airline, date and time of departure and arrival, and details of stops en route. Times should be in local times and Universal Time. Calculate flying and elapsed times.

5. Explain the workings and errors of aircraft compass and pressure instruments, for example, altimeter and air speed indicator.

6. Choose one of the following two activities:

   a. Explain the principles of a centrifugal or axial compressor jet engine and identify the main components of such an engine.

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b Discuss the relative merits of piston engines, turbojets, turboprops, turbofans, ramjets and rockets.

7 Explain the system of controlled airspace and the air traffic control organisation in the United Kingdom and European Union countries.

8 From the list of training activities complete a further six items from at least four different sections.

Aviation Skills training options

Practical skills

1 Build a solid fuel rocket and launch and recover it successfully.

2 Build and fly a control-line model aircraft, making at least three circuits.

3 Alone or with other Explorer Scouts, build and fly a radio-controlled model aircraft.

4 Choose one of the following activities:

a Build and fly an advanced kite design.

b Fly a stunt kite to perform specific manoeuvres.

5 Know the key design features of a major military or civil airfield and build a model to show these features.

6 Build a diorama, which displays at least one scale aircraft model in a realistic setting.

7 Research the history of Air Scouting and your own or a local Air Scout Group. Present your findings to a suitable interested group.

Aviation Skills training options

8. Receive enough dual instruction to be able to fly a glider or light aircraft from take-off around a circuit and position for landing to the satisfaction of the accompanying qualified instructor.

9. From the air take a series of pictures or a video film of a particular location and identify the key features overflown.

10. Achieve the Scout Paraglider Badge.

11. Achieve one of the following Scout Instructor Badges: Aeronautics, Air Researcher, Air Spotter, Astronomer, Mechanic (Air), Model Maker (Air), Meteorologist, Navigator (Air).

12. Qualify for Scout Wings for Flight Training.

13. Qualify for Scout Wings for Canopy Training.

14. One other activity of a similar nature and level of achievement as agreed by the Section leadership team.

Aviation Skills training options

Flight safety and aviation skills

1. Research in detail the requirements of training for a Private Pilot's Licence. Provide details of a suitable flying school with costings and details of sponsorship schemes available.

2. Explain the procedure for inter-airfield flights. Prepare a navigation plan or plog in draft for a pilot.

3. Choose one of the following two activities:

   a. Help as part of a Scout task force at an organised Air Display.

   b. Work as a member of a service team on an airfield on at least four occasions.

4. Help a light aircraft pilot in his duties before and after a flight, for example, moving the aircraft, strapping in, starting up and picketing.

Aviation Skills training options

5 Help a glider pilot with ground handling and launching his aircraft, and be able to assist after a field landing.

6 Help a balloon pilot in his duties before and after a flight, for example, unpacking, inflating, and recovery after a flight.

7 One other activity of a similar nature and level of achievement as agreed by the Section leadership team.

Aircraft recognition and operations

1 Identify 20 aircraft from pictures seen for not more than ten seconds each. The aircraft should be selected from the list published by Headquarters for this purpose.

2 Identify 40 aircraft from pictures seen for not more than ten seconds each. The aircraft should be selected from the list published by Headquarters for this purpose.

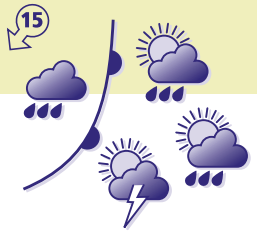
3 Identify the civil and military aircraft of at least ten countries by their national markings.

4 Demonstrate knowledge of aircraft used in a particular military campaign since 1970; the main types of aircraft flown by each side and the weapons used.

5 Discuss a particular air arm with an examiner and give examples of the aircraft used, its history and potential enemies.

6 One other activity of a similar nature and level of achievement as agreed by the Section leadership team.

Aviation Skills training options



Navigation

1. Given track, groundspeed, course and airspeed, work out the type and amount of drift and establish the wind velocity.

2. Demonstrate how the 1 in 60 rule is used for correcting track errors.
   Show how the distance marks and 5° or 10° lines may be used to correct estimated time of arrival and track errors.

3. Illustrate by simple diagram how a fix can be obtained from two position lines. Describe briefly two ways in which bearings can be obtained in an aircraft so position lines can be drawn on a chart.

4. Identify the main features of modern cockpit design and the meanings of terms such as HUDs and CRTs.

5. Understand the main principles of satellite navigation systems.

6. One other activity of a similar nature and level of achievement as agreed by the Section leadership team.

Meteorology

1. Identify the weather associated with frontal systems in the United Kingdom and be able to explain the meaning of the terms used in describing a weather map, such as col, ridge, trough and occlusion.

2. Interpret a synoptic weather map or chart and identify at least two natural signs for weather changes in your area. Set up a simple weather station and keep a logbook of your recordings over a period of one month.

3. Explain the effect on navigation of weather conditions, for example, drift, Buys Ballot's Law, air speed and altimeter errors, changes of wind directions and speed with height or at fronts.

4. Explain the danger of icing to aircraft and the conditions that may result in icing.

5. Explain the advantages of satellite images in modern meteorology.

6. One other activity of a similar nature and level of achievement as agreed by the Section leadership team.

Aviation Skills training options

Aero Engines

1. Explain the effect of altitude on a piston engine, referring particularly to mixture control, carburettor icing and the use of hot air.
2. Explain the purpose of variable pitch and constant-speed propellers.
3. Discuss the theory of propeller design, including limits of blade size and speed, blade numbers and shape and contra-rotating props.
4. Demonstrate a knowledge of the fuel systems used in space rockets or missiles and the means of control when outside the earth's atmosphere.
5. Explain the desirable design features of a modern turbofan engine family and know their applications on different aircraft.
6. One other activity of a similar nature and level of achievement as agreed by the Section leadership team.

Aviation Skills training options

Communications and air traffic control

1. Demonstrate the R/T procedure for a simple cross-country flight. Explain the distress procedure.
2. Demonstrate knowledge of the main aircraft navigational aids and systems, with special reference to their use by private pilots.
3. Explain the basic principles of radar and its uses in aviation.
4. Explain the right of way rules for different types of aircraft. Explain collision avoidance rules for aircraft on converging or head on courses and when overtaking.
5. Demonstrate knowledge of navigation lights, instrument flying conditions and the quadrantal height rule.
6. One other activity of a similar nature and level of achievement as agreed by the Section leadership team.

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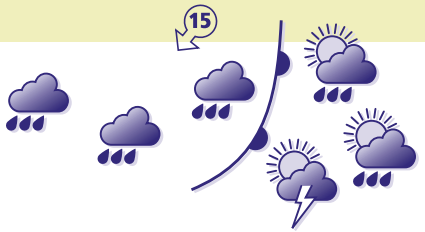

Principles of flight

2 List the forces acting on a glider and explain how soaring flight is obtained, referring to thermals, wave lift and ridge lift.

2 Demonstrate knowledge of the special prolems of supersonic flight.

3 Demonstrate knowledge of the basic principles of helicopters and how they are controlled.

4 Understand the principles of unstable aircraft (civil and military) and fly-by-wire control sytems.

5 Explain the main features of 'stealth' technolgy and its principle uses.

6 One other activity of a similar nature and level of achievement as agreed by the Section leadership team.