

Airmanship Badge Programme (For all 3 sections)

Scout Section

Airman Badge



To gain this badge, Scouts must complete the requirements below:

1. Know the rules relating to access to airfields in Singapore. Draw a diagram/ map or make a model of an airfield to show and name the different areas.
2. Understand the terms: nose, fuselage, tail, main-plane, port and starboard. Know the names of the control surfaces of an aircraft.¹
3. Construct and fly a chuck glider and fly for at least 5 seconds or build and fly a kite.
4. Basic Radio Telephony
5. Choose one of the following activities:
 - a. Collect photographs or pictures of six aircraft that interest you, name them and their operational uses.
 - b. Discuss an airline that you are interested in, or have travelled on, showing pictures of aircraft livery and logos.
6. Take part in a Patrol or Troop visit with other Scouts to a place of aviation interest.
7. From the list of Aviation Skills training activities complete two items, each to be taken from a different section.

Senior Airman Badge



To gain this badge, Scouts must complete the requirements below:

1. Hold the Airman Badge
2. List the main types of aircraft and identify the parts of an aeroplane.
3. Identify 12 aircraft in use today from pictures or in flight. These must include at least two civil commercial aircraft, two military aircraft and two light private aircraft.
4. Explain how wind speed and direction are measured and how weather can affect various air activities. Demonstrate how to obtain a local forecast for an air activity.²
5. Intermediate Radio Telephony.²
6. Demonstrate ability to trim a suitable model glider to perform a straight glide, stall and specified turn. Explain the relationships between lift, drag, thrust and weight.³

¹ Part of Scout Progress Badge (Air) – Airmanship (1)/ Scout Standard

² Part of Scout Progress Badge (Air) – Airmanship (2)/ Advanced Scout Standard

³ Part of Scout Progress Badge (Air) – Air Proficiency (1)/ Advanced Scout Standard

7. Choose one of the following activities:
 - a. Fly in a light aircraft as a passenger and know the rules in Policy, Organisation and Rules relating to flying.
 - b. Help to organise a visit to an airfield or place of aviation history for a group of Scouts. Explain to your assessor what you would need to tell the Scouts prior to the visit.
 8. From the list of Aviation Skills training activities complete a further four items taken from at least four different sections.
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¹ Part of Scout Progress Badge (Air) – Airmanship (1)/ Scout Standard

² Part of Scout Progress Badge (Air) – Airmanship (2)/ Advanced Scout Standard

³ Part of Scout Progress Badge (Air) – Air Proficiency (1)/ Advanced Scout Standard

Master Airman Badge



To gain this badge, Scouts must complete the requirements below:

1. Hold the Senior Airman Badge
2. Name the main control surfaces of an aeroplane; explain how they work and how they are controlled.⁴
3. Explain the duties of an aircraft marshaller and demonstrate marshalling signals.⁵
4. Know the types of air maps and the conventional signs used on them.⁶
5. Choose one of the following activities:
 - a. Explain the basic principles of a piston engine, including the four-stroke cycle, with consideration of valve and ignition timing.
 - b. Compare and contrast the main parts and workings of a piston engine and a jet engine.
6. Explain the difference between ground speed and air speed and how wind is used in take-off and landing. Explain how a wing gives lift. Explain the causes of stalling.⁴
7. Advanced Radio Telephony
8. Take part in an air experience flight and point out on an air map the features that are over flown.⁵
9. From the list of Aviation Skills training activities complete another six items from at least four different sections.

Air Scouts who completed the respective Progress Badges will be exempted from the corresponding sections in the Airmanship Badges.

⁴ Part of Scout Progress Badge (Air) – Airmanship (3)/ 1st Class Scout Badge

⁵ Part of Scout Progress Badge (Air) – Air Proficiency (3)/ Chief Commissioner Award

⁶ Part of Scout Progress Badge (Air) – Air Proficiency (2)/ 1st Class Scout Badge

Venture Scout Section

For Venture Scout Standard

Skills Proficiency Badge

Complete Senior Airman Badge

Activity Proficiency Badge

Instruct a group of Scouts in their Airman Badge

For Venture Scout Cord

Skills Proficiency Badge

Complete Master Airman Badge

Activity Proficiency Badge

Instruct a group of Scouts/Venture Scouts in their Senior Airman Badge

*Ventures who completed the respective proficiency badges will also be allowed to wear the corresponding Air Scout Wings.

Rover Scout Section

For Explorer Badge

Scouting Skills 1

Complete Airman Badge

For Voyager Badge

Scouting Skills 2

Complete Senior Airman Badge

For Pathfinder Badge

Scouting Skills 3

Complete Master Airman Badge

*Rovers who completed the respective proficiency badges will also be allowed to wear the corresponding Air Scout Wings.

List of Aviation Skills Activities (For all 3 Sections)

Practical Skills

1. Build and fly one of the following:
 - a. a rubber-powered model for at least 15 seconds
 - b. a glider for at least 15 seconds
 - c. a model airship
2. Build a scale model aircraft to a satisfactory standard from:
 - a. plastic kit, plans or photographs. Talk about the aircraft's key points and history
OR
 - b. by modifying a standard kit, produce a different but authentic version of the aircraft
3. Make a solid model where all control surfaces operate and can be used to demonstrate their effect.
4. Know the rules in Policy, Organisation and Rules relating to flying and fly in an aircraft as a passenger.
5. Undertake a project to demonstrate a particular aeronautical principle and build a suitable model to illustrate it.
6. Build and fly at least five different designs of paper aeroplane, using published plans if desired.
7. One other activity of a similar nature and level of achievement as agreed by the section leadership team.

Flight Safety & Airmanship

1. Know the dangers posed to aircraft by birds and other wildlife and the methods employed to reduce the problem.
2. Understand the working of an airport fire service or emergency team, the equipment employed and main rescue methods.
3. Know the reasons for airport security, the main threats and means of counteracting these threats.
4. Explain how an aircraft lifejacket works. Demonstrate its use.
5. Draw a runway and its circuit patterns indicating:
 - a. climb-out, cross wind, downwind, base leg, final leg
 - b. runway markings
 - c. taxi-ways over-shoot under-shoot areas
6. Explain and illustrate the purpose and workings of an ejector seat.
7. Understand the physical fitness requirements to fly as a pilot or passenger. Be aware of health concerns such as ear blockage, hypoxia and deep vein thrombosis.
8. Understand the responsibilities of the commander of an aircraft. Examples include briefings, safety of load and passengers, completing relevant paperwork.
9. Demonstrate pre-flight inspection of an aircraft and explain why inspection of each part is important to safe operation.
10. One other activity of a similar nature and level of achievement as agreed by the section leadership team.

Aerospace Operations

1. Describe at least six airlines by their names and markings, completing one of the following:
 - a. Identify the home countries and main operating bases.
 - b. Describe six routes operated by each airline, together with the aircraft used.
 - c. Describe the operations of an all-cargo airline. Know the main types of cargo aircraft and their special applications.
2. Discuss the design characteristics of a chosen aircraft in relation to its operational role.
3. Understand the principles of air launched and ground based anti-aircraft weapons and the systems used to counteract them.
4. Demonstrate knowledge of air and space surveillance systems, their types and applications.
5. Understand the advantages of mid-air refuelling for military aircraft, the main methods of fuel transfer and the main types of tanker employed.
6. Discuss the problem of aerospace flight including acceleration to escape velocity, the reason for weightlessness and re-entry problems.
7. Demonstrate a general knowledge of the progress of space exploration, describing in particular one space programme.
8. Understand the principles of re-usable space vehicles. Know their advantages and disadvantages over conventional rocket systems/launch vehicles.
9. Explain the roles of two recent space probes and two recently launched satellites, giving the main types of instruments used.
10. Demonstrate the scale of the solar system with a drawing or model to show the relative positions of the planets.
11. Any other one activity of a similar nature and level of achievement as agreed by the section leadership team.

Navigation

1. Explain the workings and potential errors of an aircraft compass.
2. For a cross-country flight of at least 80 kilometres, work out the time of flight from an overhead starting point to an overhead destination for a given airspeed, assuming (i) a given headwind, (ii) a given tailwind.
3. Explain the workings of a Global Positioning System (GPS) and be able to demonstrate its usage.
4. Explain the workings of aircraft pressure instruments, for example an altimeter or air speed indicator. Explain the sources of errors.
5. For a cross-country flight of at least 80 kilometres, determine a heading given a track, wind speed and direction.
6. Demonstrate knowledge of conventional symbols used on an aeronautical chart and show how to do simple flight calculations.
7. Illustrate latitude and longitude by simple diagrams. Explain the need for different types of map projections.
8. Show a basic knowledge of Aeronav aids and equipment. Understand the concept of GPS.
9. Any other one activity of a similar nature and level of achievement as agreed by the section leadership team.

Meteorology

1. Identify the basic clouds and explain how they are formed.
2. Explain how wind speed is measured and how weather can affect various air activities.
3. Demonstrate how to get a local forecast for an air activity.
4. Explain the flight conditions that can be expected in various cloud formations and weather conditions.
5. Outline how temperature and pressure are measured, list the units used and demonstrate conversions between different units by use of tables and by calculation.
6. Collect detailed weather maps of the United Kingdom either from the Internet or from a newspaper for a two-week period. Illustrate the development of significant weather features over this period.
7. Demonstrate ability to interpret Met Office reports and forecasts for pilots, such as METAR and TAF.
8. Any other one activity of a similar nature and level of achievement as agreed by the section leadership team.

Aero Engine

1. Explain how jets or rockets obtain thrust. Explain the principle of the ramjet.
2. Explain the principles of a centrifugal or axial compressor type jet engine and identify the main components of such an engine.
3. Discuss the relative merits of piston engines, turbojets, turboprops, turbofans, ramjets and rockets.
4. Identify the main types of aircraft fuels and fuel systems.
5. Demonstrate knowledge of the causes of aircraft noise and disturbance. Know the design methods used to reduce aircraft noise and how the effects on local communities can be reduced.
6. Demonstrate knowledge of the effect of aircraft engine emissions on the atmosphere and how these can be reduced.
7. Any other one activity of a similar nature and level of achievement as agreed by the section leadership team

Communication & Air Traffic Control

1. Identify the signals used on an airfield signals square, together with runway and airfield markings.
2. Identify the lamp and pyrotechnic signals used on an airfield.
3. Understand why Morse code is still transmitted by navigational beacons and be able to recognise six three-letter sequences either from a recording or written copy.
4. Explain the system of air traffic control in use at a small civilian airfield.
5. Demonstrate examples of the ground-to-air emergency code.
6. Understand the need for clearance in areas of military flying.
7. Any other one activity of a similar nature and level of achievement as agreed by the section leadership team.

Principles of Flight

1. Explain the meaning of trim and the importance of weight and balance.
2. Explain the purpose and operation of flaps, slots and slats.
3. Explain how basic aerobatic manoeuvres are carried out.
4. Demonstrate knowledge of the principles of take-off and landing with special reference to light aircraft.
5. Explain the methods by which short or vertical take-off can be achieved.
6. Describe the airflow around a modern square parachute, explaining how it develops lift and how it is controlled.
7. Attain a reasonable standard on a home computer flight simulator programme and understand why the aircraft behaves as it does. The suitability of the programme is to be agreed by the section leadership team.
8. Any other one activity of a similar nature and level of achievement as agreed by the section leadership team.