



Lesson and Activity Ideas

These student activity ideas can be adapted to meet the learning levels and interests of students in lower, middle and upper primary. Following are broad learning outcomes for students participating in an Air Force Balloon school visit and related follow-up activities. Students will:

- learn about hot-air balloons and how they fly
- understand some of the general principles involved in aviation
- gain an understanding of the Air Force, and how it assists and protects the Australian community.

Science / Design & Technology

- Students to collect a variety of objects made from different materials, and of various sizes and shapes. They are then to carefully throw and drop the objects, and observe their behaviour in flight. Discuss with students why movement through the air varies for different objects; for example, why some objects might stay in the air longer than others, or why the path made through the air might vary between objects of different shape.
- Clouds are a visual indicator of what is happening to the air in the atmosphere. Discuss with students how clouds are formed by changes in the temperature, moisture content and movement of air, and why the types of clouds forming in the sky might be important to pilots.
- Hot-air balloons are able to climb, descend and travel great distances without engines. Discuss with students how a combination of heating the air inside the hot-air balloon, releasing warm air from a vent in the top of the balloon, and the nature of the wind in which it is flying, make this possible. What might be some of the advantages and disadvantages of this form of flight in comparison to aircraft that have engines?
- In groups, students to blow up balloons of the same type with different amounts of air and seal them to prevent the air escaping. They are then to observe the different flight characteristics of the balloons when they are dropped and thrown horizontally. Students to investigate why they behave differently and what principles of flight might be involved.
- Students to each design and make a paper model aircraft. Using a stopwatch, they are to record how long each model stays in the air from the time it is thrown. Discuss with students why some models stay in the air longer than others. Students to investigate possible design characteristics that might explain why the performance of different models varied.
- Students to simulate the lift generated by an aircraft wing by holding the top corners of a piece of A4 paper up close to their lips (*lips should not touch the paper*) as if the paper was rigid and they were trying to hold it out horizontally away from themselves. Then, students to blow strongly over the top surface of the paper. They will notice that the air moving over the surface of the paper near their lips draws the other end of the paper upwards. Students to investigate why this experiment demonstrates an important principle used in aircraft wing design.

Mathematics / Mathematics - Numeracy

- Students to each blow up a balloon of the same type with a single breath of air. They are to then measure the circumference of each balloon and graph the results. Discuss with students how the size of the circumference of a hot-air balloon might affect the way in which it flies, and the number of passengers it can carry.
- Students to plan a hot-air balloon flight between two towns found on a map. Assume the wind is blowing at 15 kilometres per hour in the direction of the flight. Students to measure the distance between the towns and, with the knowledge that the balloon will travel at the same speed as the wind, calculate how long it will take, using the formula: $\text{time} = \text{distance} \div \text{speed}$.



SOSE / HSIE / The Humanities / Society & History

- Students to research significant events in the advancement of the aviation industry, from the first powered flight by the Wright brothers in 1903, to the present time. What effect, if any, did these events have on the Australian community? Students to display their findings on a timeline.
- Students to investigate the humanitarian missions undertaken by the Royal Australian Air Force, both in Australia and overseas. In groups, students to present their findings on a poster.

English / English Language / English - Literacy

- Students to work in pairs to conduct an imaginary interview with, or write a diary entry by, one of the first French pilots to fly in a hot-air balloon in 1783.
- Students to create their own KWL chart. It should include: what they Know about how hot-air balloons fly, What they would like to know and then, following some research, what they have Learnt about how hot-air balloons fly.

The Arts / Creative Arts

- Students to imagine taking a hot-air balloon flight. They are to draw or paint what they think they would see as their balloon carried them over the countryside.
- Students to make wind and percussion instruments to create a soundscape that conveys the feeling of being a passenger in a hot-air balloon, from the peacefulness of floating through the air to the loud blast of the gas burners.

Health & Physical Education / Personal Development / Health & Wellbeing

- Students to investigate how the comfort of passengers has improved, from the first passenger flights through to the present time. Students to verbally report their findings to the class.
- Students to investigate what safety features are provided for jet fighter pilots who are required to fly their aircraft to extreme manoeuvrability and performance limits. They are to then draw and label each safety feature.

Languages / LOTE / English - Literacy

- Students to design a safety sign that could be used for an Air Force Balloon display. They are to use symbols and words from at least three different languages.
- Students to investigate the Phonetic Alphabet e.g. A = Alpha, B = Bravo, C = Charlie etc. This alphabet is used in aviation throughout the world to communicate over the radio. Students to discuss why they think pilots would use this special alphabet instead of just saying A, B, C. Students to write a short phrase using the Phonetic Alphabet and then communicate it to a friend (*using the word 'break' between each word or letter group*) to see if it can be accurately interpreted.