



# HOT AIR BALLOONS

## Lesson Ideas

Curriculum-linked lesson ideas and accompanying activity sheets written for primary and middle years students, exploring the topic of hot air balloons and flight.

## Broad learning outcomes

Using this curriculum material will assist students in achieving the following broad learning outcomes:

- Students will learn about hot air balloons and how they fly.
- Students will understand some of the general principles involved in aviation.

## English

- 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 about hot air balloons including what they know, want to know and have learnt.
- Students to find the hidden message by completing '**The Great Hot Air Balloon Word Search**' activity sheet.
- Students to read the information about hot air balloons (in the 'Facts for students' section of the For Teachers for students website) then complete the '**Test Your Knowledge – A Quick Quiz**' activity sheet.

## Mathematics

- Students to each blow up a balloon of the same type with a single breath of air, measure the circumference of each balloon, graph the results then compare the measurements of other students. 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:  $\text{time} = \text{distance} \div \text{speed}$ . Students should show their calculations.



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## Science

- Students to collect a variety of very light objects made from different materials, and of various sizes and shapes. They are then to carefully throw or drop the objects from a height and observe their behaviour in flight. Record results.

Discuss with students why movement through the air varies for different objects. Why do some objects stay in the air longer than others, or why does the path made through the air 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. Students to research several types of cloud and then discuss 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. Students to use the '**PMI**' activity sheet to record advantages, disadvantages and interesting facts about this type of flight.
- 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 or thrown horizontally. Students to investigate why they behave differently and what principles of flight might be involved.
- Students to explore the concept of 'thrust' by making an air engine. Instructions can be found on the '**Make an Air Engine**' activity sheet.
- Students to discover how adjusting the density of the air in and around a hot air balloon causes it to go up or down, by making a Cartesian diver. Instructions can be found on the '**Make a Cartesian Diver**' activity sheet.

## Humanities and Social Sciences (History, Geography, Civics and Citizenship, Economics and Business)

- 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.



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- Students to investigate the history of the hot air balloon. Who invented it? How has it progressed and changed? Students to present their findings to the rest of the class.

### The 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.
- Students to create a unique design for a hot air balloon. As an extension, students could make a papier mache balloon and transfer the design to it.
- Students to make their own hot air balloon following the instructions on the **'Hot Air Balloon 1'** or **'Hot Air Balloon 2'** sheets.

### Technologies

- Students to investigate various materials and decide if they would be appropriate to construct hot air balloon envelopes or baskets. Why or why not?

### Health and Physical Education

- Students to investigate the safety features that are part of a hot air balloon. What rules would passengers have to follow to stay safe on a flight? Students to devise a safety presentation that could be shown to passengers before take-off.

### 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.