



Can it fly? Teacher notes

Key Stage 1

Science:

- Investigative skills
- Forces and movement

Key Stage 1

Design and Technology:

- Developing ideas
- Evaluating processes and products

Overview of the activities

There are three activities described. Each activity is self-contained, and so can be run individually. In sequence, they follow a logical progression. The activities look at:

1. Can it fly?
Children look at a range of items and suggest if they are able to fly or not.
Presentation and card sort activity.
2. Why do balloons fly?
Children investigate helium-filled balloons.
3. Paper aeroplanes
Children make and test-fly paper planes.

NOTE: a suitable risk assessment must be performed before carrying out any practical activity.

Science background notes for teachers

Early flight used 'lighter than air' balloons. Strictly speaking, it is the density of the gas inside the balloon that matters. Less dense than air and the gas will generate uplift. This can be thought of as similar to objects floating in water. Materials less dense than water will float. Those that are more dense will sink.

Hot air balloons fly (or 'float') because the air inside the balloon is heated by the burner and is less dense than the colder air outside. An airship contains helium gas which is less dense than air and so it rises. Early airships contained hydrogen gas but this is too flammable and no longer used.

When considering balloons, also think about the material the balloon is made of and any structures it carries. This will add weight and so inhibit the balloon from rising. The volume of the balloon needs to be sufficient to generate enough lift to overcome the total weight of the balloon.

Powered or heavier than air flight uses wings that are able to 'push' against the air and generate an upward force (lift). To do this, they must be moving and so aeroplanes have propellers or jet engines to generate the movement. A helicopter's rotor blades are effectively moving wings.

Rockets generate upward force from the rocket motor at the base.

Kites and hang gliders effectively 'catch' the force of the wind. In themselves, their 'wings' do not generate lift. They allow the kite or hang glider to ride the air currents and wind that is present.

Gliders need to be towed to altitude to enable them to catch the wind currents and generate lift. Once high enough, their forward motion can be used to generate lift and a skilled pilot can use air currents to fly for great distances. Some birds are able to soar on the wind currents in this way after they have flapped their wings to reach a suitable altitude. For example, a buzzard whilst it is surveying the ground below for food.



Activity 1: Can it fly?

Children examine objects and things that can fly and some that cannot. Are there similarities or differences? Can children predict what will fly and what will not?

Preparation

- Download the PowerPoint presentation, Can it fly? for use with an interactive whiteboard.
- Print and cut cards for card-sort activity.
The images for the card sort can be found following this activity.

Activity Notes

Talk through the Can it fly? presentation.

The presentation contains images of objects. Some can fly and others cannot.

Show the slides in the presentation and use it to get the children thinking about what types of things can fly and which ones cannot. There are 10 examples, not all need to be shown.

Complete the card sort activity. Children group the cards into ones showing things that can fly and ones which cannot.

Have children identify any similarities or differences. In groups, children discuss their ideas and must be able to justify their decisions. Groups share ideas with the class. This could be via group-group conversations or as group-whole class feedback.

Conclude with some general observations. Things that fly:

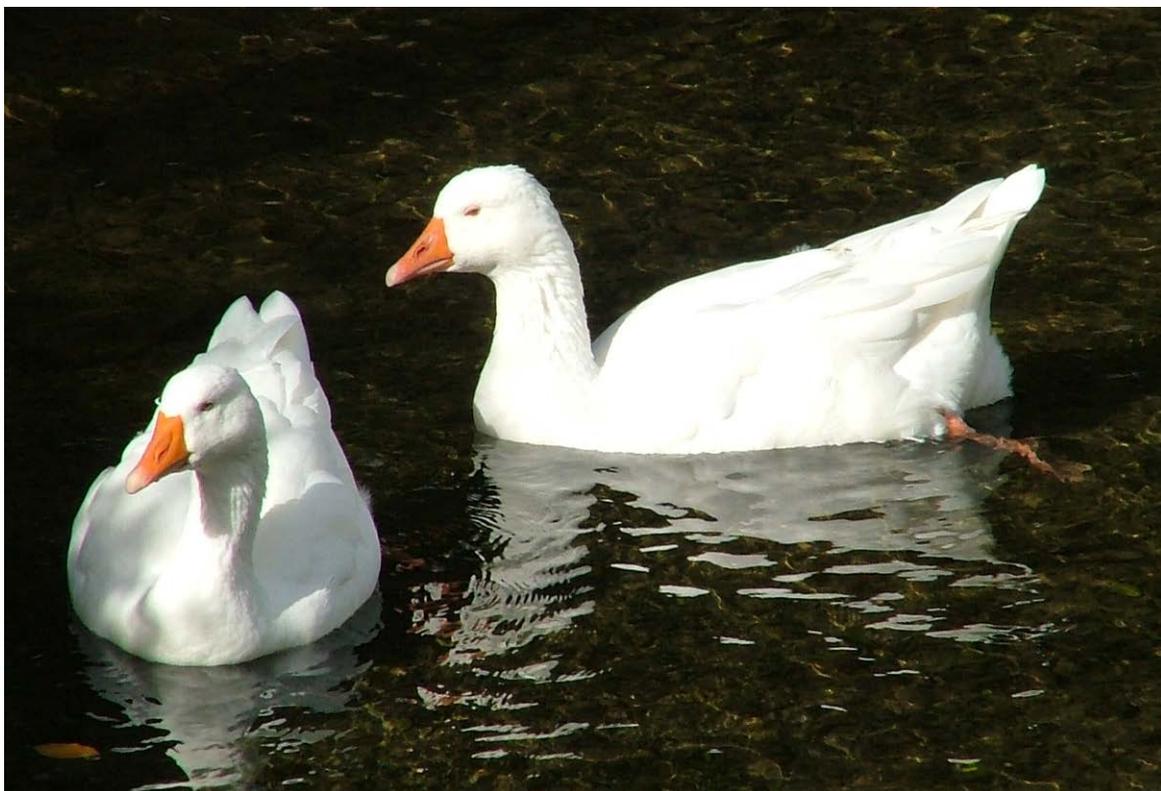
- may be lighter than air
- have wings that can push them upwards
- in some way can catch the wind (kites and hang gliders)

Extension

Have children draw a picture showing a bird's eye view of their school.

TAKE FLIGHT

Exploring our aviation heritage



TAKE FLIGHT

Exploring our aviation heritage



TAKE FLIGHT

Exploring our aviation heritage



TAKE FLIGHT

Exploring our aviation heritage

Aviation Heritage
Lincolnshire
a partnership of Lincolnshire's aviation heritage



TAKE FLIGHT

Exploring our aviation heritage

Aviation Heritage
Lincolnshire
a partnership of Lincolnshire's aviation heritage



TAKE FLIGHT

Exploring our aviation heritage

Aviation Heritage
Lincolnshire
a partnership of Lincolnshire's aviation heritage



TAKE FLIGHT

Exploring our aviation heritage

Aviation Heritage
Lincolnshire
a partnership of Lincolnshire's aviation heritage



TAKE FLIGHT

Exploring our aviation heritage



TAKE FLIGHT

Exploring our aviation heritage





Activity 2: Why do balloons fly?

Children experience the feel of lift caused by a helium-filled balloon. Get over the idea of 'lighter than air' causing the balloon to float.

Preparation

- Helium-filled balloons that float (typically available from card or gift shops). Tie a long cotton thread – long enough so that balloons can be retrieved if they float to the ceiling. One per group of children.
- Rubber balloons filled with air. These will not float. Cotton thread of same length as helium balloon to ensure comparable tests. One per group of children.

Activity Notes

Why do balloons fly?

Draw attention to the helium balloons and airship images on the presentation and cards. These fly because they are 'lighter than air' craft.

Compare helium-filled balloons with air filled balloons.

Have children hold the two types of balloons by their threads. What happens? Which one floats and which one sinks? Can they feel the helium-filled balloon pulling up?

Explain that the balloon filled with helium is 'lighter' than air and so floats upwards. That is, the helium and the balloon material together are lighter than the air around it. The normal balloon is heavier than air (it contains air plus the weight of the balloon).

Extension

Have children investigate what small items can be lifted by the helium-balloon. Can more be lifted if strings from two or three balloons are tied together?

Activity 3: Paper Aeroplane

Children make and fly paper aeroplanes. A template is provided but children can try different designs and materials.

Preparation

- Paper aeroplane template (attached below)
- Download video instructions if required

Activity Notes

Children use the template to make and test paper planes. Take care to launch paper planes safely so that they do not cause any damage or hit other children in the face.

Explain that the planes need a forward motion to fly. They cannot 'take off' on their own. This can be used to link the idea of wings generating lift when there is a forward motion.

Show jet take-off to illustrate need for forward motion (see YouTube video clip at: <http://www.youtube.com/watch?v=1zclkA9PkFQ> for take-off, landing and taxi of commercial passenger jet).

Run a competition to see who can make the paper plane that flies the furthest/fastest/slowest/highest/in a circle etc.

Extension

Test different designs of paper aeroplanes or ones made from different types of paper or card.

TAKE FLIGHT

Exploring our aviation heritage

Aviation Heritage

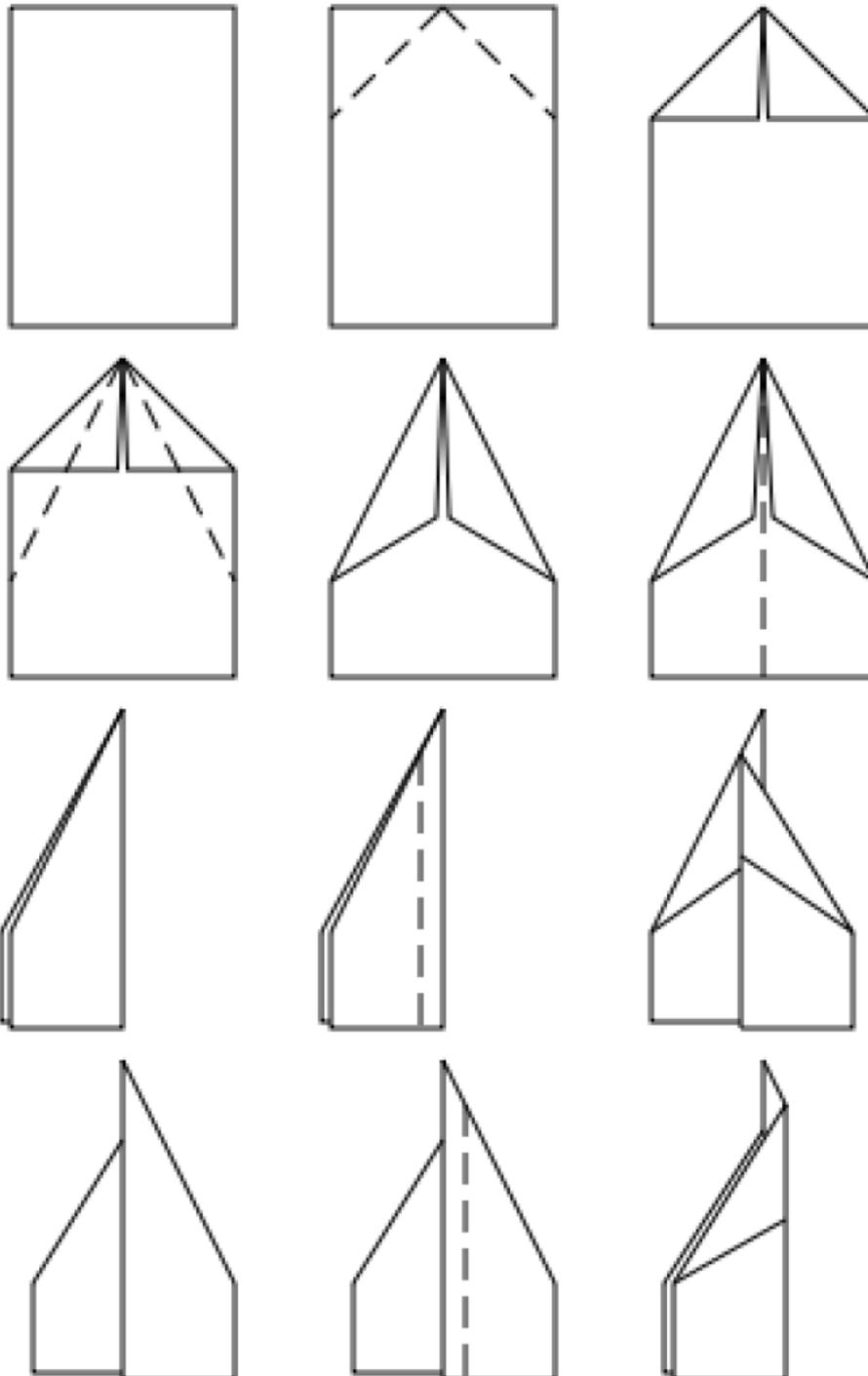
Lincolnshire

a partnership of Lincolnshire's aviation heritage



Paper Aeroplane

Make the folds shown by the dotted lines.



Source: wikipedia