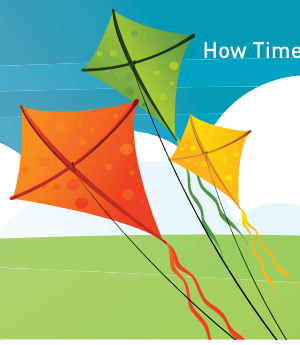
Activity 13
The History of the Kite



New Words and Phrases

accurate
measurement
symmetry
sequence
billow
flexibility

Suggested Learning Intentions

We are learning to:

- research the history of the kite;
- observe the forces involved in the flight of a kite;
- investigate symmetry;
- observe how wind powers a kite;
- research, design and make a model kite; and
- list how we use kites today.

The History of the Kite

Introduce the topic of kites to the children. Ask them what they think kites are used for. Once they have answered, ask them to consider other uses that kites could have had in history.

Split the class into four groups and give each group a topic to research:

- the invention of the kite in China;
- the use of kites in World War II;
- the use of kites in Afghanistan; or
- the use of kites for recreation today.

When they have completed their research, they can make a poster or presentation for the rest of the class.

Forces on a Kite

With the children, recap the different types of forces that they know about, including push, pull, collision, lift, drag, thrust and weight.

Ask the children to consider the structure of a kite and an aeroplane and the forces acting on them. Then ask them to consider what a kite and an aeroplane have in common, and what they need to make them fly.

Some points to note:

- With the exception of thrust, the forces acting on a kite are the same forces that act on an aeroplane.
- Like an aircraft, kites are heavier than air and use aerodynamic forces to fly.
- Kites have a solid frame, normally made of plastic or wood. The frame is covered in plastic, paper or cloth to generate the lift necessary to overcome the kite's weight.
- Like an aeroplane, a kite must be as light as possible for good performance, yet strong enough to withstand high winds.
- A kite is slightly curved at the top, where the material is stretched over the frame. Like the wings on a plane, this creates an aerofoil (see Activity 7).

CONNECTED LEARNING OPPORTUNITIES

Mathematics and Numeracy
Investigate lines of symmetry in regular and irregular shapes.

Language and Literacy
Write about the adventures of a flying kite.

The Arts
Explore music and dance related to kites.

Using ICT
Produce a presentation on the topic of kites and upload to LearningNI.

ASSESSMENT FOR LEARNING OPPORTUNITIES

Make a table to record the children's predictions as they carry out the investigation. Compare and contrast their predictions with the outcomes.

- The air travelling over the top of the curved surface moves faster than the air passing underneath it. Fast moving air creates low pressure. This means there is more pressure underneath the kite, creating lift and forcing the kite upwards.

Kites and Symmetry

Discuss what the children know about 'symmetry'. They may need to revise the subject. Show them a selection of real kites or images from the internet.

Discuss why they think a kite needs to have symmetry and list their ideas. To fly properly, a kite needs to be symmetrical in several ways:

- Sail shape – the shape of the kite needs to be exactly the same on each side. Otherwise it won't fly straight.
- Weight – if the weight is uneven, the kite could tip to one side.
- Flexibility – if one side of the kite bends more than the other, the kite might loop out of control.
- Billow – if the kite material is not attached strongly enough to one side of the frame, it will 'billow' unevenly. This prevents the kite flying smoothly.

Make and Test a Kite

Give each of the children two sheets of A4 paper to make a kite. Ask them to place one page in front of them (landscape) and mark the measurements shown in figure 1. Then, using a ruler, accurately draw folding-lines. Remind them that they need to measure and fold carefully, so that their kite is symmetrical.

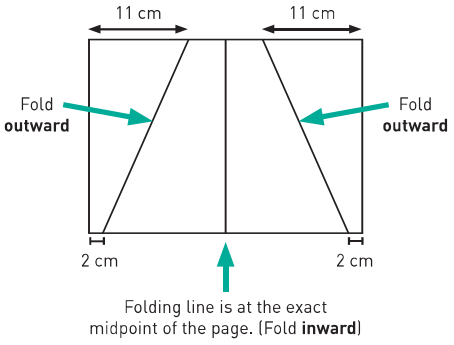
Allow the children to colour and decorate their kites. Then they can fold the sheet to make their kite.

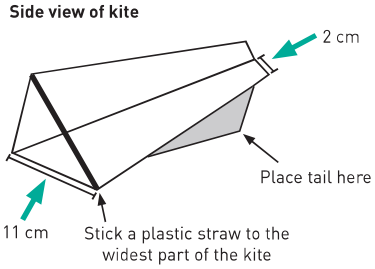
Then ask them to:

- draw lines 2 cms apart on the second page and accurately cut the page into strips;
- join the strips together, lengthways, to create a long tail;
- attach the tail to the base of the kite; and
- tie a string to a paper clip and attach it to the base of the kite.

Allow each child two attempts at flying their kite. Encourage them to consider how to improve their design, if the kite does not work. For example, they could reposition the paper clip holding the tail. Take photographs of the kites flying.

Figure 1





Investigation Time

Let the children design and make a kite. Working in small groups, they can use their research to decide which style of kite, such as diamond or rectangular shape, to make. Photograph the children exploring kites throughout the activities.

1. Using the same measurements as before, let the children create new kites using different materials. For example, they could use plastic or different weights of paper. Let them test each kite to see how long it flies for and how well. They may need a stopwatch to accurately record how long the kite stays in the air. They should record their findings in a table (*Table 1*).
2. Ask the children to make a kite using the same materials as before, but changing the size. They must keep the dimensions the same ratio. For example, if they double the size of the page from A4 to A3, they must double their measurements. Let them test their kites and record their findings in a table (*Table 2*).

When they have completed the tasks, encourage the groups to discuss their findings and draw conclusions about what affects the flight of a kite. As a class, summarise their conclusions and compile a list of agreed statements.

Extension

Upload photographs of the activities into a folder on your computer that the children can access. Ask them to choose which photos they would like to use and copy them into a Word document. They could then use the photographs to create a report called 'How we made our kites'.

Table 1

Type of material	Comments on the material	Comments on the flight of the kite	Time in air (seconds)
plastic	*a strong material*	*It flew high and stayed in the air for 10 seconds.*	
light paper			

Table 2

Type of material	Comments on the material	Comments on the flight of the kite	Comment on the size of kite	Time in air (seconds)
plastic	*a strong material*	*It flew high and stayed in the air for 10 seconds.*	*20 cm*	
light paper				