



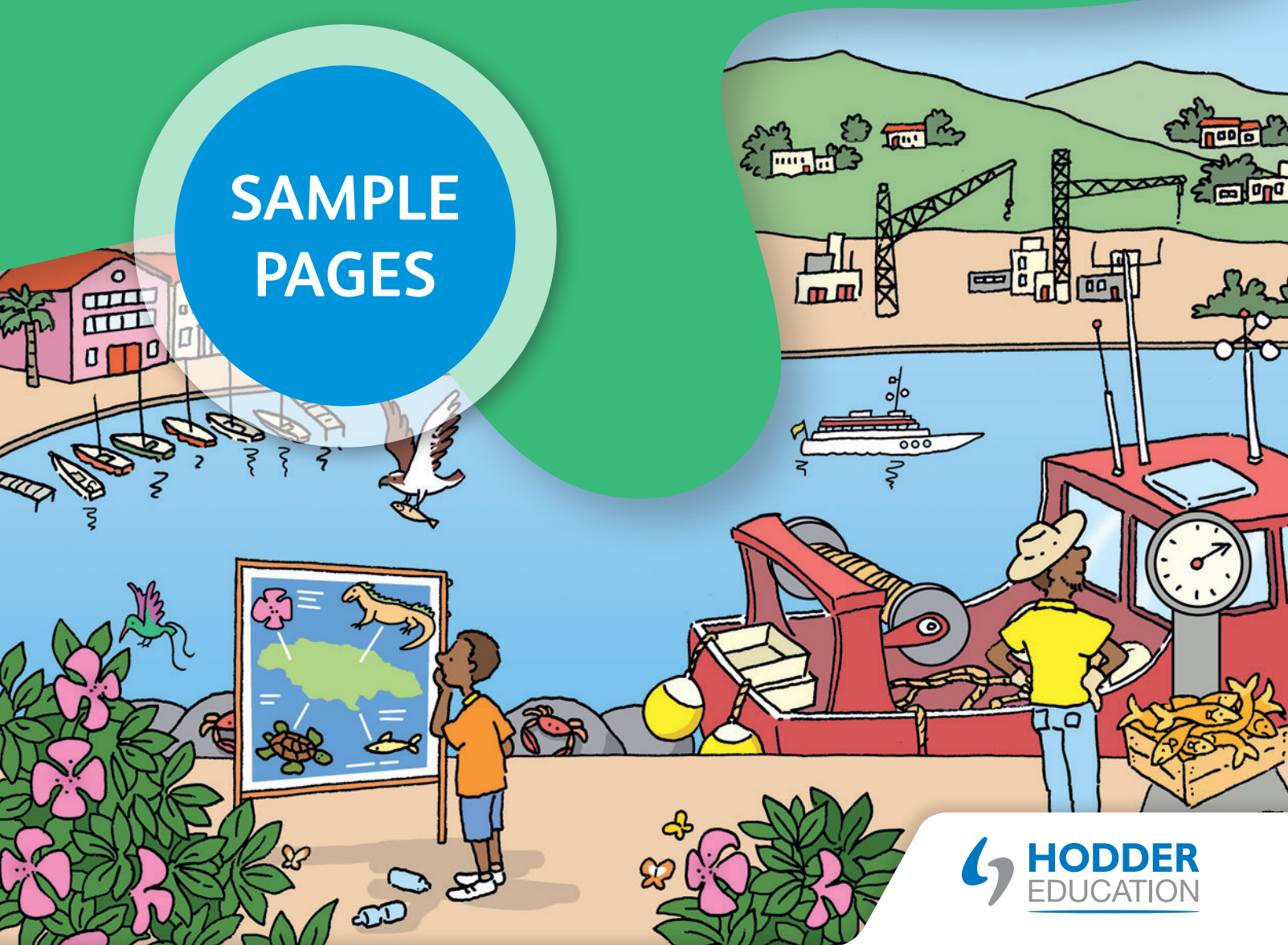
Caribbean *Primary* Science



Level 6



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Being a scientist

This topic develops some of the skills that you will use this year as you do investigations, carry out research and present your findings.

Asking and answering questions

When you ask questions in science and try to find the answers, you are acting as a scientist. Many questions can be answered by doing an experiment or carrying out an investigation (in other words, by carrying out a fair test). Some questions can be answered by making observations or by taking measurements. Some questions might be too complicated to answer without specialised science knowledge.

Here are some useful starting points for questions in science.

- * What happens if ...?
- * How can I cause it to ...?
- * Does it matter if ...?
- * How will I know if it always ...?
- * Where can I find ...?
- * Could I measure ...?
- * How can I find out whether it depends on ...?
- * What kinds of __ are best for __?
- * Will it work better if I change ...?
- * How many ...?
- * Why does it ...?
- * How does it compare with ...?

You cannot answer questions like these with a 'yes' or 'no' answer because they are open-ended questions. In science, open-ended questions are more useful because you should be able to use science to find the answers.

1 Consider these plant seeds.



- a Write down three scientific questions you could ask about these seeds.
- b Show your questions to a partner and talk about how you could find the answer to each of your questions.

- 2 Nikita did some research to answer some questions she had about plants. This is what she found out:

The raffia palm has the longest leaves of any plants. Some of their leaves can be 20 metres long.

The trunks of different kinds of palms vary in size from 1.5 centimetres in diameter to 1.2 metres in diameter.

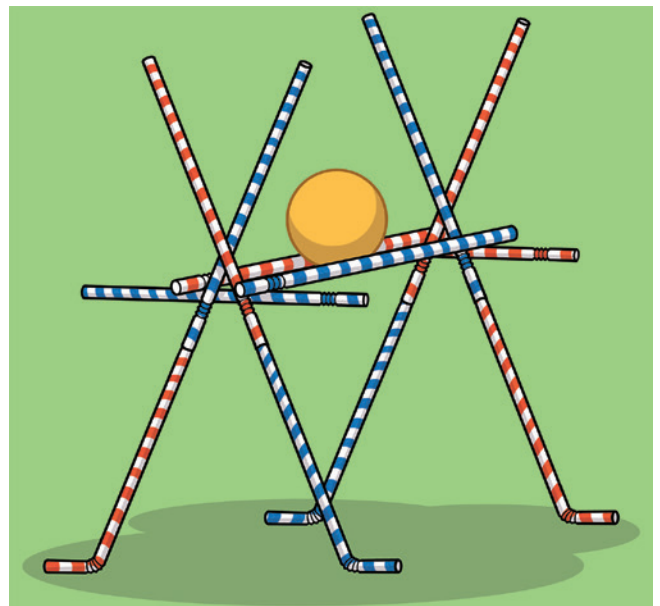
The veins transport water to the different parts of the leaves, and transport food made by the leaves to the other parts of the plant.

If you look closely at leaves you will find small pores (holes) on the back surface. These are called stomata.

Plants in deserts and dry regions have smaller leaves and fewer stomata to prevent water loss.

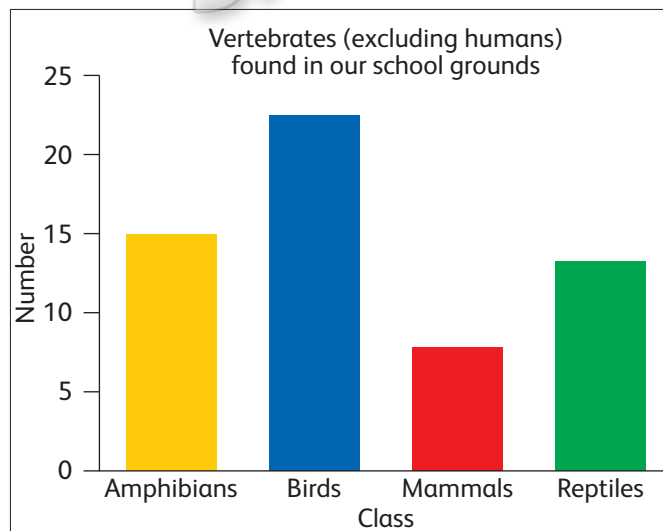
Work with a partner to work out what questions Nikita may have asked to get each of these answers.

- 3 Laura and Mica built a tower to hold a ping-pong ball, but it was not very stable. They wanted to improve their design.
- Make up five questions starting with 'What would happen if we ...'.
 - Choose one question and try to answer it by building your own tower.

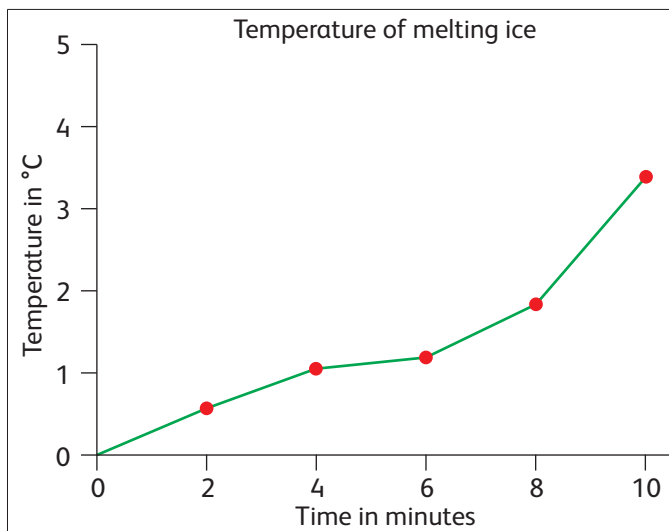


Recording and interpreting results

When you find your answers by counting or measuring, you can use tables and graphs to record and display your answers and results. Graphs make it easier for you to read the information and to see patterns in the results.



Bar graphs are useful for comparing sets of data, or numbers of objects in different groups.



Line graphs are useful for showing changes over time. Line graphs are normally used when you take measurements.

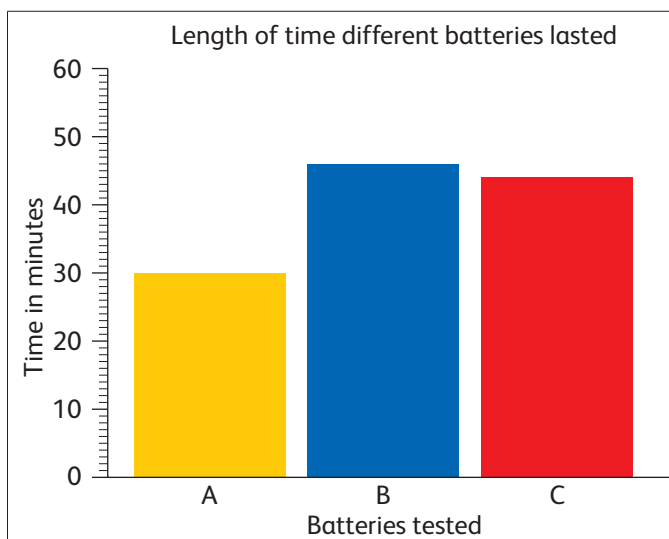
- 4 Make a list of the things you need to include to make a graph clear and useful.

When you read a graph and make sense of the information it shows, you are **interpreting the data**.

You can also use the information on a graph to help you find answers to your questions. This is called **analysing the data**.

You can **draw a conclusion** using what you learn from interpreting and analysing data. For example, if you look at the line graph, you can conclude that the temperature of the ice increases quite slowly at first and then it starts to increase more quickly.

- 5 A class did a test to see which type of battery lasted the longest in a small fan. They drew this graph to show their results.
- Why do you think they drew a bar graph even though they were measuring time?
 - What conclusions can you draw from these results?



Explaining observations

In science, we want to know how and why things happen. Some things are fairly simple to explain. For example, when you stir sugar into a cup of warm tea, it disappears. We can explain why this happens – sugar dissolves in the hot liquid.

Other observations are not as simple to explain. For example, why are plants in one area of the school garden dying while all the others are doing well? To explain why this is happening, you would need to do an investigation, because there are many things that could cause the plants to die. The reasons could be that the soil might be too dry, there may not be enough light, the plants may be getting too much water, the plants could be diseased or have been attacked by pests, the type of plant might not be suitable for the area, or someone might have sprayed weed killer or spilled soapy water in that part of the garden.

- 6 Read these observations. Work in groups to suggest reasons for each observation.

I noticed that a wet rag dries more quickly when there is a breeze blowing on it.

We found that leaves from a succulent that fell on the ground had grown small roots.

We discovered that there is more litter around the tuck shop than in any other area of the school.

We observed that when the wind blows from the east, it often rains in the afternoon.

Making careful observations

Observation involves using your senses to learn about things around you. But some things are difficult to observe because they are too small for us to see using only our eyes.

Scientists use instruments to magnify objects. This makes the object appear larger so that you can see it. One of the instruments you will use to do this is called a hand lens.

Hand lenses are useful for observing the external structure of plants, the minerals in rocks and small organisms.

To use a hand lens, you hold the handle and look at the object through the lens. Move the lens closer or further away until you can see clearly. When the object looks big and clear through the lens, it is in focus.



- 7 Observe a leaf or a rock using a hand lens.
 - a Describe what you can see, then make a labelled sketch of it.
 - b What can you see with the lens that you could not see without it?
- 8 What safety precautions should you take when you are using a hand lens? Discuss this as a class.
- 9 Work in pairs. Use your hand lens to observe and compare your thumbprints. Discuss what you can see and how your thumbprints are similar to and different from each other.

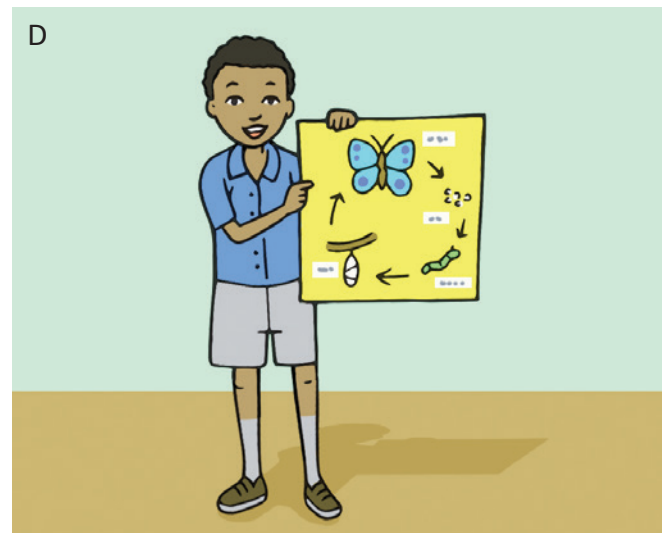
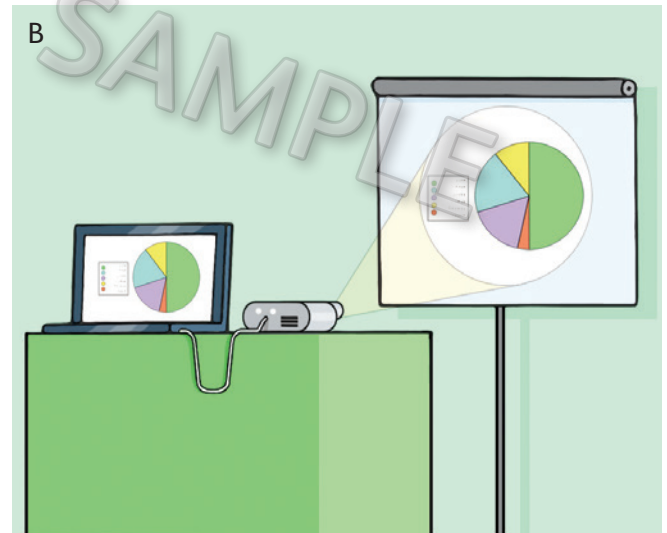
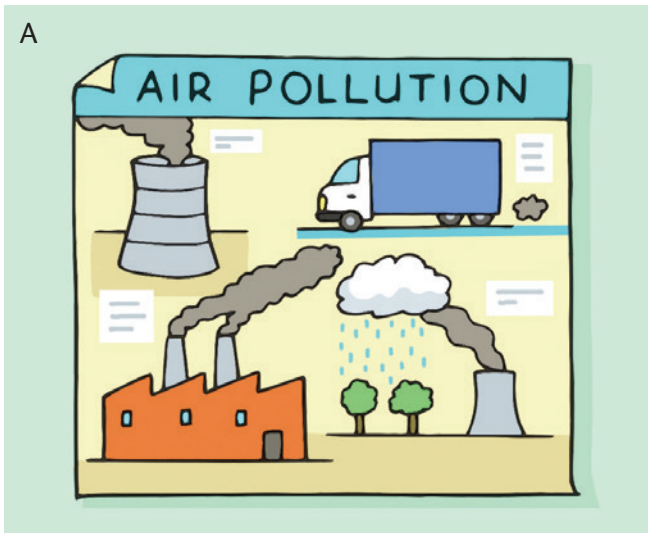
Communicating and presenting your findings

When you do an investigation it is important to communicate your results and observations clearly so that anyone else reading them can make sense of them.

There are many different ways to communicate scientific findings – labelled diagrams, tables, graphs, photographs and even maps can be used to do this.

Sometimes you will be asked to present your findings to your group or to the class.

- 10 Look at each of the methods shown in the illustrations for presenting findings to a group.
 - a Talk about what is involved in each method of presenting.
 - b For each method, talk about the types of investigation that could be presented in this way.



- 11 As a class, make up a list of rules for commenting on each other's presentations in a polite and supportive way. Include how you will give good suggestions for improving each other's presentations.

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