CurriculumVisions 1C Science@School

Sorting and using materials

Teacher's Guide CD

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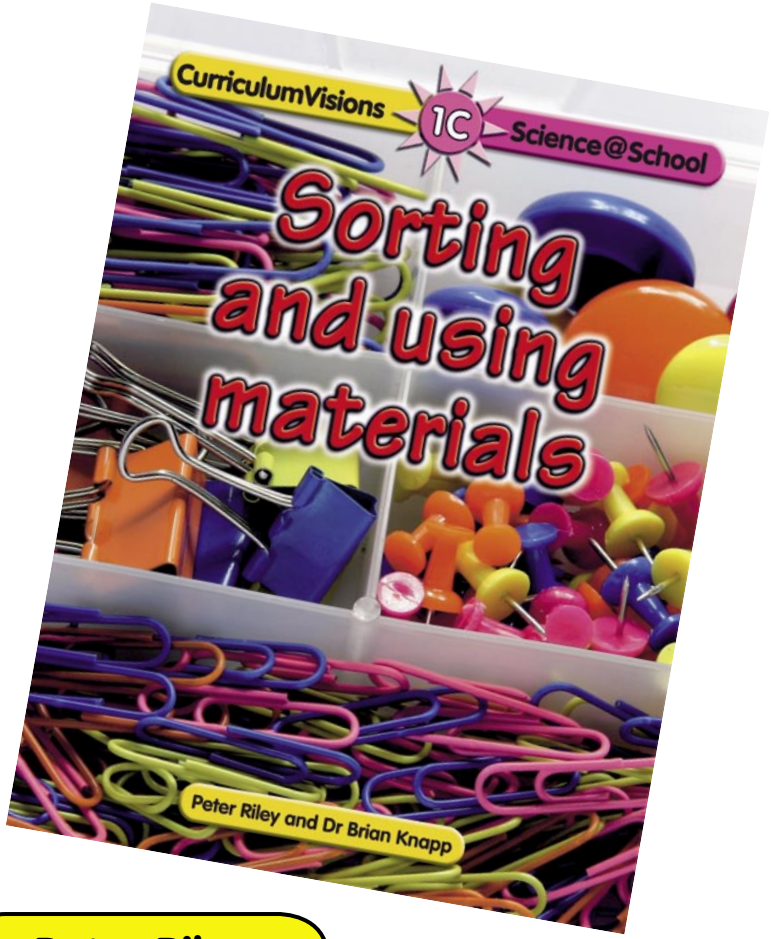

Peter Riley

Curriculum Visions

A CVP Teacher's Guide

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Author
Peter Riley, BSc, C Biol, MI Biol, PGCE

Senior Designer
Adele Humphries, BA, PGCE

Editor
Gillian Gatehouse

Illustrations
David Woodroffe

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Introduction

The pupil's book

The Key stage 1 Science@School series is a series of twelve books. Each one addresses one of the QCA units in the Key Stage 1 science curriculum.

Each spread in the book addresses one or more objectives in a QCA unit by providing photographs, simple text and questions to stimulate discussion.

Each book has an illustrated glossary and a simple index for finding information.

The teacher's guide

It may be that you already have a scheme of work and wish to use the books to support it. Alternatively you could use the books, this CD ROM and the **CurriculumVisions.com** web site, which provides support material in the form of extra text (with audio option), pictures, captions, activities and demonstration videos to build a new scheme. Whichever way you choose, the notes in this teacher's guide have been set out as if you were using each page or spread as the basis for a lesson. You may follow each set of notes in their entirety to build up your lesson or take parts of the notes to fit into your scheme.

The teacher's notes contain information about practical work. You should check your school policies on practical science work and only select activities for which you are confident to take responsibility.

The book *Be Safe!* published by the ASE (ISBN 978–0–86357–324–8) provides useful guidance on carrying out science activities.

The structure of the notes

The notes for each page or spread follow the same structure, which is outlined here.

Objectives

These may be linked to the QCA objectives or build on them to enrich the topic.

Resources and preparation

Suggestions may be made for building on the visual display of the books with posters and models.

There are also pictures (aka flashcards) at the end of the notes to each lesson, which may be printed off and used as triggers to start the lesson or used in the plenary as revision. When the pictures have been used they could be displayed on a wall and others added as the subsequent lessons are completed. This will make a colourful summary of the work which could be used as a final revision resource when the book is completed.

If you are using the **CurriculumVisions.com** web site log in, go to Science, Year 1, Unit 1C Sorting and using materials.

There may be some suggestions for building practical work into the use of the pages in the book and these include a list of requirements (simple, readily available materials) and advice on preparing the requirements for use in the lesson.

Introduction

Starting the lesson

Each lesson begins with a short activity, which helps settle the children and focus them on the work ahead.

Activities with the page

These may be reading activities, observing and discussing the pictures or answering a question. There may also be practical activities which are designed to develop a range of practical science skills from making observations to carrying out fair tests.

Differentiation

There are suggestions for providing help and activities for children of different abilities.

Assessment

There are suggestions for assessing the children's work. There are three assessments for you to print off at the end of this guide. These are for use with lesson 2 (page 61), lesson 3 (page 63) and lesson 9 (page 65), or you could use all three together as an end of unit test. Guidance for the answers is given in the assessment section of the lesson notes.

Plenary

The work done in the lesson is reviewed in this section and there may be a further activity to help secure the children's knowledge.

Outcomes

These may be linked to the QCA objectives or build on them to enrich the topic.

Things around us

Objectives

- To know that there is a wide range of objects in the surroundings.
- To know that an object can be seen and touched.

Resources and preparation

A collection of stones and pebbles, a collection of objects from a garden such as a trowel, a plant pot, a cane, a bird feeder, a garden gnome. Keep the pebbles and gnome for lesson 4.
A recording of 'My favourite things' from the Sound of Music.

Starting the lesson

Ask the children if they have got any collection of things at home. They may have a collection of shells, shiny things or certain toy characters. Show the children your collection of stones and pebbles and ask them to comment on it. They may say they could sort them into white stones, yellow or brown. Introduce the things from your garden collection one at a time. Begin by saying that you are going to show them a group of objects from a special place and you want them to guess what the place is. They must not put their hands up to answer until the last object has been shown. Be prepared for frustration as some children will be keen to answer! Present them with the garden gnome last. When they have concluded that the place is a garden ask the children if they noticed that you had been using the words thing and object. Ask them what an object is and look for answers about something that can be seen and touched. Tell the children that we use the words thing and object to mean things we can see and touch around us.

Activities with pages 4 and 5

- Read the introductory lines with the children and then look at each picture and label and ask the children to hold up their pen, pencil, ruler and the pupil book.
- Let the children read the question at the bottom of the page and look around the classroom to point out other things such as the door, table, chairs, shelves, the whiteboard, a television.
- Move on to page 5 and read the introductory sentence then look at the pictures and the labels with the children.
- Let the children read the question at the bottom of the page and talk about the things that they have at home.

1 Teacher's sheet 1C

Differentiation

Less confident learners could list how many different things they may find in a kitchen. More confident learners could write a list of the biggest things in the world and the smallest things in the world.

Assessment

The children could be assessed on their ideas for the lists of things.

Plenary

Less confident learners could report their list of kitchen things. More confident learners could read out their lists or display them on a wall for all to see. Play the recording of 'My favourite things' once and see if the children can remember any of the favourite things mentioned in the song. Play the song again to check their answers. Ask the children about their favourite things. If several things are mentioned frequently you may be able to make a pictogram of the results. If appropriate the children could be invited to bring in their favourite thing for the next lesson or you could say that you will bring in a few of your favourite things.

Outcomes

The children:

- Know that the word for object can be used to describe something they can feel and touch.
- Know that the word 'thing' may be used for the word 'object'.

2 Teacher's sheet 1C

Materials

Objectives

- To know that materials are used to make objects.
- To know that there are many different kinds of material.

Resources and preparation

A collection of your favourite things or, if appropriate, a collection of the children's favourite things securely stored before and after the lesson. Some objects should show obviously what they are made from – e.g. a wooden spoon, a plastic cup, a metal fork. A collection of footwear featuring leather shoes, plastic sandals, canvas trainers, etc. A collection of blouses and shirts made from cotton, nylon and other materials all with labels.

Starting the lesson

Show the children some of your favourite things (or if the children have brought in theirs let them show them to the class). Hold up one of the things (which shows obviously what it is made of) and ask the class what it is made of. Look at some more things. Point out any which are made of two or more materials.

Activities with pages 6 and 7

- Read the introductory sentence with the children then give each one a ball of modelling clay and ask them to make something.
- Give the children time to think what to make and then make it. Let them display their thing and say what it is.
- Review with the children that they have used a material, modelling clay, to make a thing or object.
- Read the text on page six with the children. Ask them if they know what wood is and look for an answer about it being a hard material made by trees. Ask the children what leather is and be prepared for blank faces. Direct them to the glossary on page 23.
- Look at the mugs and read the caption with the children. Ask them to find out about plastic in the glossary.
- Look at the pencils and read the caption. Ask the children to look around the classroom and see if they can see any other objects made of wood – e.g. chairs, doors, shelves, cupboards.

2 Teacher's sheet 1C

- Move on to page 7 and look at the boots and read the caption. Show the children your collection of footwear and point out those made from leather. Ask the children to look at their footwear and see what it is made of – many may find that their school shoes are made of leather.
- Read the paragraph about the materials around the boy and ask the children to find out more about cotton in the glossary. Hold up a cotton shirt and pass it round so the children can feel it. The children can feel their own shirts and blouses to compare and may find that they are also made of cotton.
- Let the children examine the collection of shirts and blouses and look at the labels.

Differentiation

Less confident children may need help thinking about and making an object with modelling clay. More confident children could use two or more colours of modelling clay to make their object.

Assessment

The children can be assessed on the quality of their models and their contribution to the classroom discussion and readiness to make comparisons about footwear and shirts and blouses. There is an assessment sheet at the end of the guide (page 63).

Assessment guidance

1. a cotton
   b leather
   c glass and plastic
   d metal and plastic
   e plastic, pottery, metal
2. Table, bowl, chair, cupboard.

Plenary

Display the models that children have made and review the materials that they have studied in the lesson.

Outcomes

The children:

- Know that objects are made from one or more materials.
- Know that there are many different kinds of material.

Properties

Objectives

- To know that each material has properties.
- To know you can identify a material by its properties.

Resources and preparation

A wooden ball and a rubber ball. One or more soft plastic toys, one or more toys made from hard, smooth plastic, one or more metal spoons, dough in a tin and a metal knife, one or more pieces of sandpaper, shampoo, a clay teapot, cup and saucer.

Starting the lesson

Show the children the wooden ball and the rubber ball. Ask them what material each ball is made from. If they are unsure tell them that we can also use our sense of touch, as well as our sense of sight, to identify a material and let them touch the balls. They may have seen that the wooden ball is grainy, a property of wood, and felt that it was hard, another property of wood. The rubber ball would not have looked grainy, indicating that it is not wood and when they felt it they would find that it was squashy but returned to its original shape – a property of rubber. Ask them what might happen if you dropped each ball on the ground and then test their predictions. The children should discover that the wooden ball does not bounce much while the rubber ball bounces a great deal more.

Activities with pages 8 and 9

- Read the first two sentences and reflect on the behaviour of the two balls when you dropped them. The children could be asked about how ball games would be different if all materials behaved like wood. Look for answers about hurting feet when kicking a wooden ball or hurting hands when catching it.
- Look at the soft plastic toy and read about it with the children. Pass round a soft plastic toy and let the children feel it. Some children may wish to tell you about their soft plastic toys.
- Look at the mobile phone with the children and read about it. Pass round a hard plastic toy and again be prepared for children telling you about their toys.
- Look at the cutlery and read about them then pass round the spoons. Ask the children how the metal feels like the plastic (it is hard like the hard plastic) and feels different from the plastic (it feels colder than the plastic). (This is due to metal being a better heat conductor than plastic and takes more heat from the skin making it feel colder – the children do not need to know this.)
- Read about dough with the children and ask them to find out more about it in the glossary. Produce a lump of dough out of a tin and let it flop back into it. The children could come out

and touch it and feel that it is soft. You could cut the dough up with a metal knife and point out that the metal is hard and shiny and the dough is dull and soft. Do not use the dough to make food.

- Read about sandpaper and pass around some samples for the children to investigate.
- Read about the shampoo and ask the children to find out what foamy means by using the glossary. Pour some shampoo into a bowl of water and make a lather of tiny bubbles.
- Look at the wooden bowl and read about wood. Remind the children of the wooden ball you used when starting the lesson.
- Look at the teapot and read about it. Show the children the teapot and the cup and saucer in class. Ask them about another object they use that is made from clay, when they have a meal and look for an answer about plates.

Differentiation

Less confident learners could look for plastic being used around the classroom. They may find that it is used to make drawers, window frames, pens and computer cases. More confident learners could look for metals being used around the classroom and find nails, screws, chair and table legs, paperclips and staples.

Assessment

The children can be assessed on the ease at which they can turn to the glossary when instructed. They can be assessed on their observational skills at finding plastic and metal in the classroom. There is an assessment sheet at the end of the guide (page 63).

Answer guidance

Metal - shiny, hard, smooth.
Wood – dull, hard, smooth.
Pottery – hard, smooth, shiny.
Glass – hard, smooth, shiny.
Brick – hard, rough, dull.

Plenary

Read the question on page 9 and look for an answer about it being hard and dull. Point out that a material does not just have one property, it has a few. Ask them to tell you about the properties of wood – and look for answers about it being hard, grainy, dull and does not bounce much.

Ask about metal and look for answers about it being hard, smooth, shiny and feeling cold. Tell the children you are thinking of a material and you are going to tell them its properties. When they hear them they have to guess what the material is. Tell them you are thinking of something that is dull, soft and can be cut up easily and look for an answer about dough. Invite the children to think of a material, describe its properties and challenge the rest of the class to identify it.

Outcomes

The children:

- Know that materials have properties.
- Can recognise the properties of some common materials.

Sorting

Objectives

- To recognise that materials have different properties.
- To be able to sort materials according to their properties.

Resources and preparation

A piece of brick, or concrete block, pebble, shell, (preferably a whelk shell or similar seaside shell which may be available at a fishmongers) a piece of wood, a metal garden ornament, pebbles and gnome from lesson 1. A string of fake pearls and other jewellery, a metal spoon, a piece of plastic sheet, a piece of sponge, a basket.

Starting the lesson

Tell the children that you have been outside and made a collection of materials. Show the children the materials and ask them to guess what they are. Ask the children how you should sort them into groups. Encourage them to think of colour first and several groups may emerge to get the idea of grouping. Ask them to think of another property such as hardness. This may result in just one big group although some children may suggest that wood is comparatively soft and could be in its own group. Ask the children to look around the classroom and see if they can see any other materials they could put in the groups they have just set up. They may find wooden materials in objects such as rulers and stools and the pebbles and garden gnome from lesson 1.

Activities with pages 10 and 11

- Read the introductory line and the two paragraphs on page 10 with the children.
- Look at the hard materials and relate them to the collection in the classroom. See if the children can find a paperclip and pencil sharpener to add to the collection.
- Look at the soft materials and ask the children if there are any soft materials in the classroom. The children may point to the curtains and may need some guidance to suggest that their clothes are made from soft materials. Remind the children about the dough from the last lesson and produce a loaf for the children to squeeze to discover it is a soft material that we eat (but don't let them eat it).
- Move on to look at the smooth materials. Show the children the string of pearls and any other jewellery to emphasise the smoothness of the gems and metals used in their construction. Show them the spoon and the plastic sheet. Ask the children to use the glossary to find out more about pebbles.

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- Look at the rough materials and show the children the brick again. Let the children rub their fingers across a sponge and a basket.

Differentiation

Less confident learners may need extra guidance in looking at and feeling the materials and associating them with the words hard, soft, smooth and rough. More confident learners could think about other materials in the surroundings or at home that they could put in these four groups.

Assessment

The children can be assessed on the speed at which they assign a material such as paper (smooth or soft), sandpaper (rough) and a towel (soft and rough) to a group.

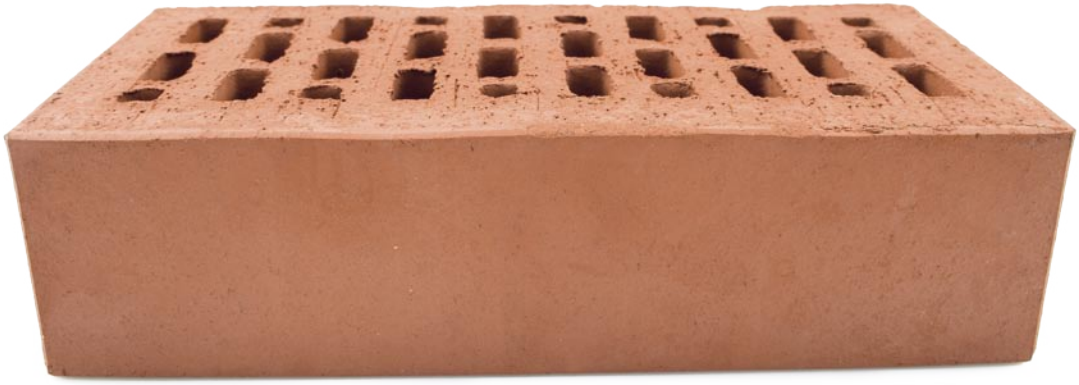
Plenary

Read the question on page 11 with the children and see if they can devise some different groups and allocate the materials to them. For example, shiny group – paperclip, pencil sharpener, pearls and metal lamp; strong group (not easily squashed) – pebble, brick, whelk shell (but not snail shell); weak group (easily squashed group) – gloves, bread, basket, sponge.

Outcomes

The children:

- Recognise that materials have different properties.
- Recognise that materials can be sorted according to their properties.



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Teacher's sheet

1C

Waterproof

Objectives

- To learn that waterproof materials do not let water pass through them.
- To devise a fair test.
- To perform a fair test.

Resources and preparation

The garden gnome or a doll (preferably plastic which dries easily). A large shallow tray, a watering can about a third full of water. Two pieces of paper, a wax crayon, a cup half full of water and a spoon per group.

Starting the lesson

Put the gnome or doll in the tray and say that you want the children to imagine that they are that figure. Tell them that the figure is outside when a large, dark cloud comes overhead, and pick up the watering can. Ask the children what might happen to them. Look for an answer about getting wet then pour the water over the figure. When the children have settled down again ask them what they should do to keep dry. Look for answers about wearing special clothes.

Activities with pages 12 and 13

- Read the introduction with the children and establish that these are the materials used to make special clothing for going out in the rain.
- Read the first two paragraphs with the children then ask them about the clothes they wear to keep them dry when coming to school.
- Read the third paragraph and ask the children about the clothes they wear that are not waterproof.
- Look at the picture of the clothes on the washing line and say that we use water to clean most kinds of materials used for clothing. (If waterproof materials are washed and cleaned they sometimes have to have a special coating sprayed onto them to make them waterproof again).
- Look at the picture about wet hair and read the caption. Tell the children that the hair on our head only makes a thin layer that water can get through. Animals with lots of hair (fur), mammals such as cows and sheep, have a waterproof coating which keeps them dry.
- Look at the picture of the apples and read the caption. Tell the children that the apple has a waxy coat and say that you wonder if it is the wax that helps make the water drops appear like beads. Work with the children to set up a fair test that they can do. They will need two pieces of paper. They must rub a wax crayon on one and cover it thoroughly. They must then collect small amounts of water on the spoon and put small drops on each paper. The children should see that the wax does indeed make the

water form beads as its surface tries to get away from the wax. It simply soaks into the paper without a wax covering.

- Look at the pictures and captions about rainwear. Ask the children who uses an umbrella, Wellingtons, poncho, anorak or other waterproof items and make a pictogram of the results.

Differentiation

The less confident learners may need guidance with the fair tests. The more confident learners could be told that scientists repeat their experiments to check their results and let them repeat their fair tests.

Assessment

The children could be assessed on the amount of guidance they need to carry out their tests. They could be assessed on the oral descriptions of their observations.

Plenary

Read the question on page 13 with the children. Work with them to design a test, which has two sheets of absorbent paper and two materials of similar area placed on top of them. Each material should then receive the same number of drops and after a certain amount of time they should be removed and the area of dampness in each sheet of absorbent paper examined and compared to find which material is the most waterproof. Groups in the class could test different pairs of materials and report and demonstrate their results to the whole class. The children can decide which material should be used to make rainwear for the gnome or doll.

Outcomes

The children:

- Know that waterproof materials do not let water pass through them.
- Can devise a fair test.
- Can perform a fair test.

6 Teacher's sheet 1C

Stretchy and springy

Objectives

- To distinguish between stretchy and springy materials.
- To recognise when a test is not fair.
- To work together in performing an investigation.

Resources and preparation

Each child or group will need a ball of modelling clay. You will need a spring, which can be extended when you pull it, a luggage holder. A cardboard strip stuck vertically down one leg of each table, a selection of balls such as table tennis ball, tennis ball, football, beach ball, solid rubber ball. A stretchy sock, pieces of thin plastic from a plastic bag. A few classroom assistants.

Starting the lesson

Give the children the modelling clay and let them roll it into a ball. Tell them that you want them to make it into a long shape and ask them what they will do. Look for an answer about stretching the material or pulling it into a long shape. Let the children make their shape. Ask the children what happened when they stopped pulling the material and look for an answer about it staying the same length. Tell the children that modelling clay is a stretchy material because it does not go back to its original shape. Show the children a spring and stretch it. Ask the children what will happen when you stop pulling the spring and look for an answer about it springing back to its original size. Tell the children that the spring is made from springy material.

Activities with page 14 and 15

- Read the introduction and remind the children about the modelling clay and the spring they have just seen.
- Read the first sentence with the children, look at the picture of bubble gum and read the caption. Ask the children what would happen if the bubble gum was springy and look for an answer about it thwacking back into the face!
- Read the next two sentences with the children and look at the picture of the trampoline and read the caption. Allow the children to tell about their experiences on a trampoline.
- Move on to page 15 and look at each picture and caption in turn. Demonstrate the stretchiness in a luggage holder as some children may not have seen one.
- Remind the children about bouncing the balls in lesson 3. Tell the children that balls bounce because they are made of a springy material. When the ball hits the floor its lower surface bends in and then springs out again and this pushes the ball back into the air. Ask the children how they could test some balls to see which one was made of the springiest material. Look

for an answer about measuring the heights of the bounce of a ball.

- Let each group of children test each ball in turn and use a pencil to mark on the card how high it bounces.

Differentiation

A classroom assistant could help less confident learners by marking the height of the ball and writing its name on the card. More confident learners could measure the height each ball bounced by taking the card and using a ruler to measure from the bottom of the card to each mark.

Assessment

The children could be assessed on how they worked together in a group to produce their results. They could be assessed on how they reported their results to the class.

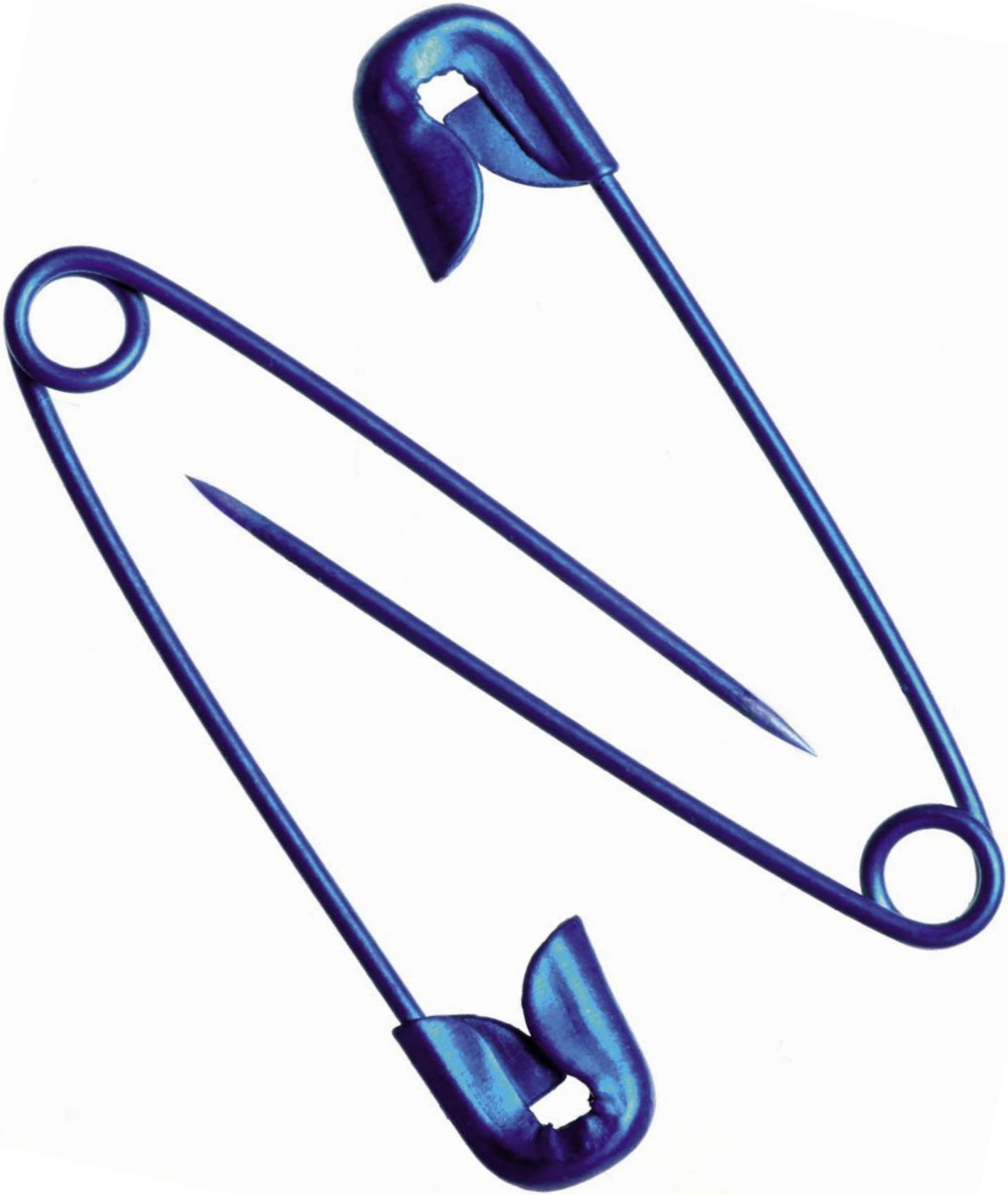
Plenary

The children could present their results to the class. Ask them why the test is not fair and look for an answer about the balls being of different sizes and having different amounts of springy material in them. Return to the book and ask them to answer the question on page 15. The children may suggest that some materials used to make clothing, such as socks, are stretchy but demonstrate that they spring back to their original shape when they are taken off. Some old woollen pullovers do become stretched. Remind children of how a stretchy material behaves by giving them a piece of plastic from a thin plastic bag and asking them to pull it. They should see that the plastic stretches but does not spring back.

Outcomes

The children:

- Can distinguish between stretchy and springy materials.
- Can recognise when a test is not fair.
- Can work together in performing an investigation.



7 Teacher's sheet 1C

Bendy and brittle

Objectives

- To recognise that some materials bend.
- To recognise that bendiness can be a useful property.
- To recognise that some materials are brittle.
- To recognise that brittleness may not be a useful property.

Resources and preparation

A piece of wire such as that used to tie plants to canes as sold at garden centres. A tall plant which needs supporting such as a pea or bean plant, a cane, a piece of dry uncooked spaghetti, a plastic bag. Each child will need a ball of modelling clay.

Starting the lesson

Show the children the plant and say that it needs supporting so all the leaves can get the light they need. Put the cane in the pot next to the plant stem and say that the next job is to attach the stem to the cane and produce the wire. Show them that the wire can be bent into all kinds of shapes and even a simple knot can be tied in it. Attach the stem to the cane with two or three pieces of wire and say how the bendy property of the wire is useful to help the plant grow. Now produce a piece of spaghetti and ask the children if this could be used instead. Look for an answer that it might snap and test the idea by bending and breaking it. Make sure you do this away from the children or place it in a plastic bag before you bend it to prevent bits spreading out over the table.

Activities with pages 16 and 17

- Read the first line and the first paragraph and remind them about the bendiness of the wire.
- Look at the picture of the car with the children and read the caption.
- Look at the other pictures and captions about bendy materials on page 16.
- Give out the balls of modelling clay and ask the children to roll them out into a long thin sausage. Ask them to make a model with as many bends in it as possible and put it to one side for later. They could hide their model in their drawer if they wished.
- Read the second and third paragraphs on page 16 and then move on to page 17 and look at the pictures and captions about brittle materials. Remind the children about the spaghetti being brittle.
- Move on to the question on page 17 and look for answers about bendy rope and string, bendy twigs (but bendy twigs will snap if they are bent too much). The children may also mention that many biscuits are brittle.

7 Teacher's sheet 1C

Differentiation

Less confident learners may need help in making their model and adding only small pieces to give the bent sausage the shape of a Chinese dragon or zigzagging serpent. More confident children could add more parts to their model such as crests and horns.

Assessment

The children can be assessed in the quality of their models.

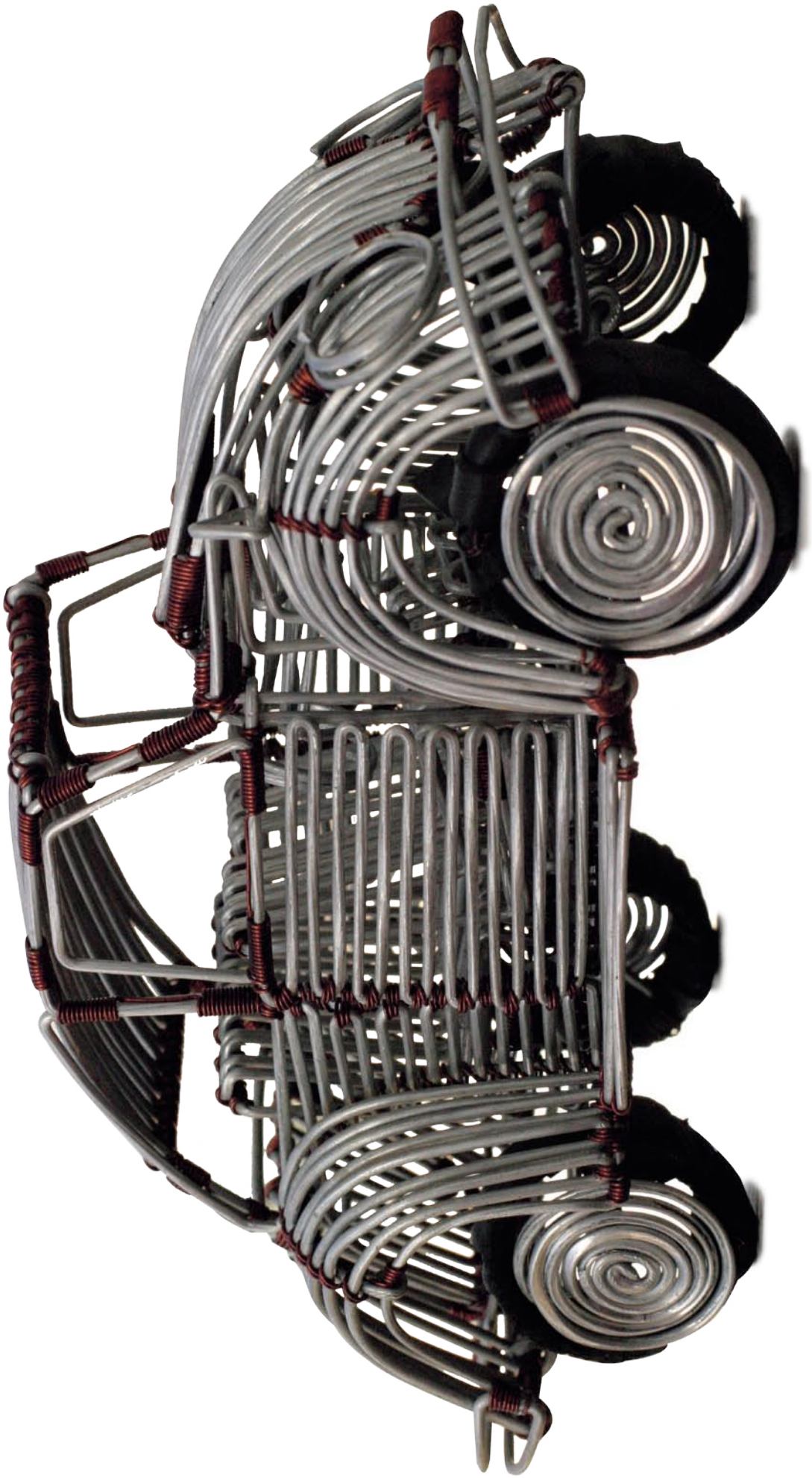
Plenary

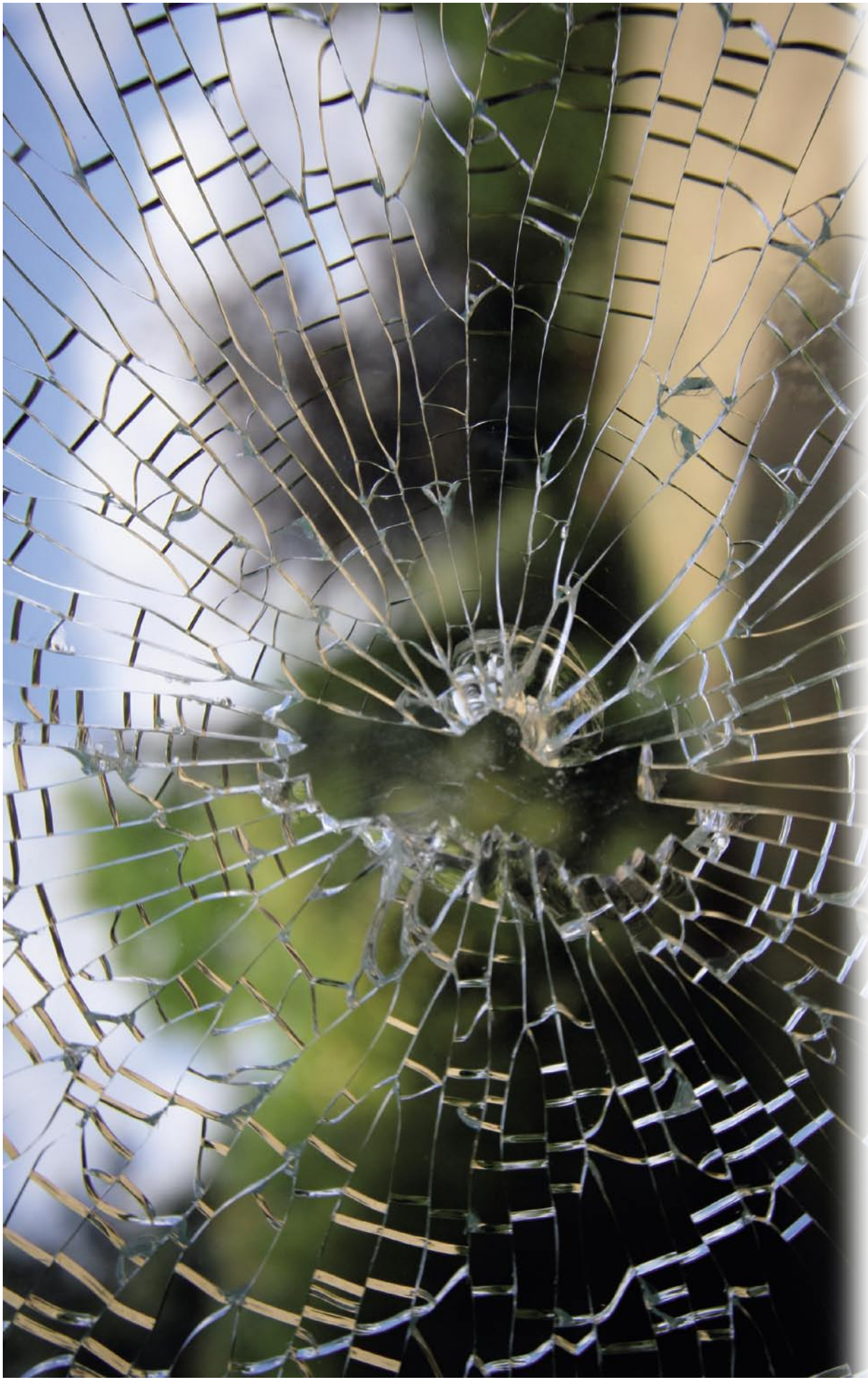
The children can bring their models out of hiding and display them to the class. You can reflect on the idea that the bending property of a material can be useful as in the case of blacksmiths bending hot iron to make horseshoes in the past, or it can be useful in making decorative objects like the car on page 16, or the children's models. By comparison brittleness is not a useful property but the materials that possess it also have other properties, like the transparency of glass, that still make them useful.

Outcomes

The children can:

- Recognise that some materials bend.
- Recognise that bendiness can be a useful property.
- Recognise that some materials are brittle.
- Recognise that brittleness may not be a useful property.





Magnetic materials

Objectives

- To learn that some materials are magnetic and some materials are not magnetic.

Resources and preparation

A bar magnet, steel paperclip, plastic pen top or similar, a small piece of aluminium kitchen foil will be needed by you and each group of children. Each group will need a piece of wood and stone, an iron (or steel) nail and piece of paper and card.

Starting the lesson

Take a bar magnet and hold it up in front of the class. Tell them that it is a magnet and ask the children what they know about magnets. They may tell you about them holding cards and paper on a fridge door but look for an answer about metal objects sticking to it or just things sticking to it. Test the idea by bringing a paperclip to the magnet and let the children see it held in place. Bring a piece of plastic to the magnet and let the children see it fall away. Bring a piece of aluminium foil to the magnet and ask the children what will happen when you let go of it. Look for an answer about it sticking to the magnet then let go and let the children see it fall away.

Activities with page 18

- Before you open the book tell the children that scientists copy the experiments of others to check them. Let them try and pick up a paperclip, piece of plastic and piece of aluminium foil and discover that they have the same results as you.
- Tell the children that we all need to find out more, issue the books and turn to page 18.
- Read the introduction and tell the children that they are going to concentrate on magnets in this lesson. Read the paragraph on the page and ask the children which of the three objects they tested was made of iron or steel. Look for an answer about the paperclip.
- Give the children a piece of wood and stone and let them test them with a magnet to check the text in the book. Tell the children that materials which stick to a magnet are called magnetic materials and materials that do not stick to a magnet are called non-magnetic materials. Get the children to identify the paperclip as being made from a magnetic material and the aluminium, plastic, wood and stone objects being made from non-magnetic materials.

8 Teacher's sheet 1C

- Give the children the iron (or steel) nail and ask them to test it with the magnet. They should find that it is magnetic. They may find that the magnet can hold both the paperclip and the nail at the same time.
- Let the children test objects around the classroom but do not let them go near any computers or television screens. They may find that the magnets stick to chair and table legs, shelf brackets and zips on clothes.

Differentiation

Less confident learners may need to spend time pulling gently on chair legs and other magnetic objects to feel the magnetic force. More confident learners could bring two magnets together and discover that two ends attract each other and two ends push each other apart.

Here is some information about magnets that you may use if appropriate.

At each end of a magnet is a strong region of magnetic force called a magnetic pole. At one end is the north pole and at the other is the south pole. They are named this way because if a magnet is floated on wood on water it will line up with one end pointing north (containing the north pole) and the other end pointing south (containing the south pole). Opposite poles attract each other and similar poles repel.

Assessment

The children can be assessed on the reporting of their discoveries about magnetic and non-magnetic materials.

Plenary

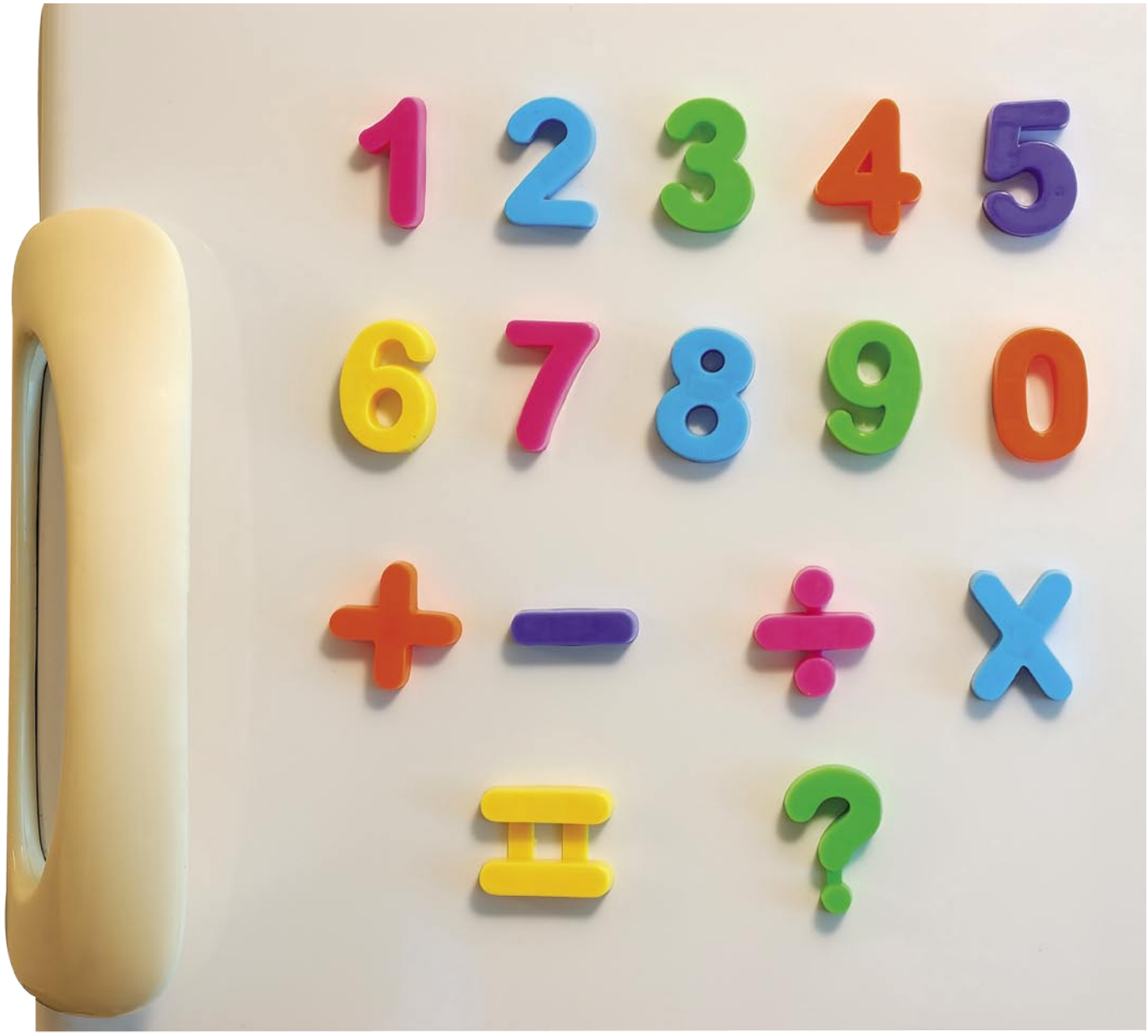
Read the question on page 18 with the children and ask them to answer it. Some children may have already discovered that paper is a non-magnetic material but let them all test a piece of paper to confirm their result. Give the children a piece of card and ask them to predict if it is a magnetic material or a non-magnetic material. Look for an answer about it being a non-magnetic material because it is like paper only thicker. Let the children test their prediction.

Ask the children if the magnet can pull on a magnetic material through a piece of card and give them a paperclip. They should find it will pull on the paperclip and when they move the magnet the paperclip moves too.

Outcomes

The children:

- Know that iron and steel are magnetic materials but most materials are non-magnetic.



Transparent materials

Objectives

- To know that a material which you can see through is called a transparent material.
- To know that most materials are not transparent.
- To know that light can pass through a transparent material.

Resources and preparation

Each child will need a magnifying glass. You may like to practise using the magnifying glass before the lesson.

The magnifying glass should be placed about 15 cm from the object you wish to see and about eight centimetres from your eye. You then move the magnifying glass slowly between the object and your eye to bring the object into focus. You will need a torch, piece of white paper, transparent plastic bottle and a book.

Starting the lesson

Line the children up facing a wall close to a window. Ask them what they can see and look for an answer about the surface of the wall. Ask them what they can see on the other side of the wall and look for an answer about not being able to see anything there. Let the children shuffle along to a window and ask them what they can see on the other side of the window. Let them tell you then tell them they can see all these things because the glass in the window is transparent.

Activities with page 19

- Read the first two lines on page 19 with the children. Look at the picture and read the caption with the children. Ask them what they can see through the window in the picture.
- Look at the picture of the girl and read about the glass of milk. Ask the children about other objects made of transparent glass in their home and look for answers about bowls, dishes, jugs, bottles, light bulbs, the windows in ovens, washing machines and spin driers.
- Look at the picture of the magnifying glass and read about it with the children. Give each child a magnifying glass (but point out that it is made from plastic for safety reasons) and ask them to look at an object such as a paperclip on the table top. Show the children how to use the magnifying glass as explained in the preparation section for this lesson.
- Let the children look at a range of objects including the skin on the back of their hand and their fingerprints.

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- Point out that the magnifying glass is made of plastic and so some types of plastic are transparent. Ask the children to name some objects in the home made from transparent plastic and look for answers which include bottles and cups. Some slices of meat are packaged in transparent plastic trays.
- Show the children a torch shining on a piece of white paper. Ask the children what would happen if you put a transparent object in the way of the light. Look for an answer about the light passing through it. Let a child put a plastic cup or bottle in the way and see that the light passes through. Ask the children what would happen if a material that was not transparent was put in the way and look for an answer about the light being blocked. Let a child put a book in the way to test the prediction.

Differentiation

Less confident learners may need the connection between light and seeing to be further explained. More confident learners could make a collection of transparent plastic objects and a collection of non-transparent objects and test them with a torch and paper.

Assessment

The children can be assessed on their contribution to the discussion by their observations through the window and with the magnifying glass.

Plenary

Look at the question on page 19 and let the children look back through the book and forward to the final topic. They should conclude that most materials are not transparent. They may notice that part of the ruler on page 4 is transparent, the tumbler on page 7, the broken window on page 17 and the window of the car on page 21 are transparent. Someone may notice that the drops of water on the apple on page 12 are transparent.

Outcomes

The children:

- Know that a material which you can see through is called a transparent material.
- Know that most materials are not transparent.
- Know that light can pass through a transparent material.

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9 Teacher's sheet 1C

Using materials

Objectives

- To link properties of materials to their uses.

Resources and preparation

Three or more large cereal packets, scissors, sticky paper, a cane basket, thin strips of paper for some groups of children, access to the school car park if appropriate.

Starting the lesson

Start cutting up the cereal packet to make a pullover but don't tell the children what you are making. Join two cereal packets to make the body of the pullover and cut out some cardboard to make the neck. Roll up some cardboard to make the sleeves and join all the pieces with sticky paper. Let the children watch you and try and guess what you are making. When they discover it is to be a pullover ask them if it will be really comfortable. Look for answers about it being uncomfortable and a person could not move much with it on and if they tried it might come to pieces where the pieces of cardboard are stuck together.

Activities with pages 20 and 21

- Read the introductory sentence with the children and reflect that you did not think about what the cardboard could do when you selected it to make a pullover.
- Read the sentences and then say that you did not select the best material for the job of making a pullover. Ask the children what you should have used and look for an answer about wool. Ask why wool is used and look for an answer about it can be bent and knitted together and that it is stretchy so it can move easily when the wearer of the pullover moves.
- Look at the picture of the basket and read about it with the children and show them the basket.
- Cut some strips of cardboard, put five parallel to each other and weave a sixth strip over and under them at right angles. Repeat with another strip but weave under and over. Tell the children that you could make the cardboard into a woven place mat.
- Read about the brick wall and note that the brick was selected because it was strong. Ask the children why glass is used in a building and look for an answer about letting light in so people can see.

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- Look at the picture and read about wood. Look for wood in use in the classroom. Focus on a door and ask why bricks or concrete were not used for the door and look for an answer about wood being lighter in weight and easier to move.
- Read about the car and steel and ask what other materials are used to make a car. If it is appropriate the children could look at cars on the school car park and discover that glass is used for the windows, plastic is used for the trim and rubber is used for the tyres.

Differentiation

Less confident learners could go on a material walk around the school with assistants to look at the materials in the entrance hall, the school hall and corridors. If the school has a canteen a visit could be arranged for them to see the materials used in preparing food. More confident learners could weave strips of cardboard to make mats.

Assessment

The children could be assessed on their responses in discussion and visits to study materials and on the quality of their woven mats. There is an assessment sheet at the end of the guide (page 65).

Assessment guidance

a = brick
b = metal
c = wood
d = wool
e = pottery
f = glass
g = cane
h = plastic

Plenary

Look at the question on page 21 with the children and look for answers about the glass not being bendy, and being easy to break.

Outcomes

The children:

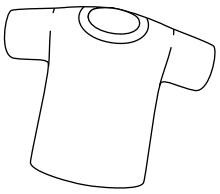
- Can link the properties of materials to their uses.

Assessment

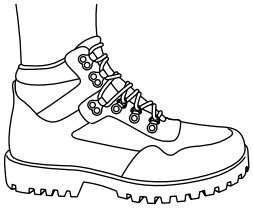
Name: .....

Materials

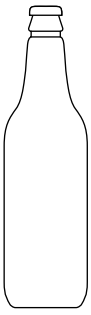
1. What could these be made of?



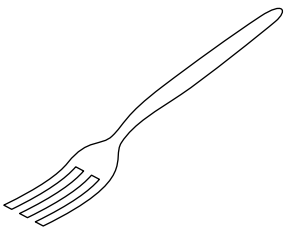
- cotton ☐
- wood ☐
- metal ☐



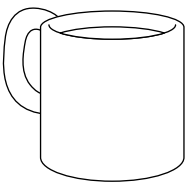
- pottery ☐
- wool ☐
- leather ☐



- glass ☐
- plastic ☐
- brick ☐



- metal ☐
- leather ☐
- plastic ☐



- plastic ☐
- pottery ☐
- metal ☐

2. Name something made of wood.

.....

Assessment

3

Name: .....

1C

Properties

1. Here are six properties of materials:

hard soft rough smooth shiny dull

2. Write down three of these properties for each material.

Metal ....

Wood ....

Pottery ....

Glass ....

Brick ....

Assessment

Name: .....

Using materials

1. Write down the name of the material in each sentence.

Pick your answers from this list:

plastic metal brick wool wood glass pottery cane

a. A hard rough material used to make walls. .....

b. A hard shiny material used to make knives and forks.

.....

c. A hard dull material used to make tables. .....

d. A soft rough bendy material used to make a pullover.

.....

e. A hard smooth material used to make a teapot.

.....

f. A hard transparent material used to make windows.

.....

g. A smooth bendy material used to make baskets.

.....

h. A rough soft bendy material used to make a sponge.

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