

Science Planning

Year Group: 5/6
Term – Materials



**Science
Lesson 1**

Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets.

Introduce the topic using PowerPoint Slides 1– 4. Tell children that they are going to create a Wordle; show them PowerPoint Slide 5 so that they have an idea what a Wordle looks like.

Give each group a pile of A4 paper that has been cut in half lengthways and make sure that there are plenty on each table along with some sticky putty.

The challenge is to write down as many words as they can that have something to do with names of materials, properties of materials and uses, one word per sheet of paper. It does not matter if a word is repeated around the class.

The aim is to elicit children’s prior knowledge of materials. Give children up to ten minutes for this activity, then ask them to create the Wordle on a wall by placing their words horizontally and vertically. Children could use ICT to create a Wordle by using a website. Children could then share and compare their Wordle with a partner, print it out and display it. Use the Wordle as a starting point for discussion with children about materials.

Introduction

Give children a range of objects made from different materials, these could be from school or home. Ask them to carry out quick challenge classifications, encourage them to refer back to their Wordle for ideas. You could leave children to see how many different ways of sorting they come up with, or engage them in a series of quick-fire groupings, e.g. ‘You have 60 seconds to sort into...’: Types of materials, e.g. wood, metal, ceramic, plastic, fabric, paper, card. Properties of materials, e.g. transparent, opaque, translucent, flexible, hard, strong, elastic, plastic, magnetic, thermal insulator, electrical insulator. Double properties, e.g. transparent and flexible. Triple properties, e.g. elastic, waterproof, opaque. Opposites, e.g. rough / smooth, transparent / opaque, flexible / rigid. This activity is a useful formative assessment point to find out those aspects children are confident with and those that they require some further support with

Children to record their ideas using ipads. Children to be encouraged to used different methods of sorting according to properties.

Science
Lesson 2

L.O. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.

Bring in an item of clothing, e.g. a warm winter coat or a ski suit. (or a picture).

Ask children to think about why the different materials have been used to make it. Make the point that objects are usually made from materials that have properties that are needed, e.g. the coat keeps someone dry and warm in winter.

Use the same set of objects from Activity 1 and tell the children to look at each object and talk about why each material has been used for the purpose.

Eg – Wooden spoon when cooking
Metal baking tray

They can record their findings on Activity Resource 2.1.

Name of object	What is object used for?	What material has been used to make it?	Why has this material been picked?
Frying pan	Cooking food	Metal	Hard and strong. It lets heat through quickly.

Children requiring a little more support – to complete sheet with pre populated objects to simplify the task.

Ensure that at the beginning of the activity children understand the expectation that all scientific words must be checked using a dictionary or word mat before they are written down. You might ask the children to identify which are materials and which are properties (perhaps as a mini plenary). They go through the Wordle and write an 'm' on the materials and 'p' on the properties.

Science
Lesson 3

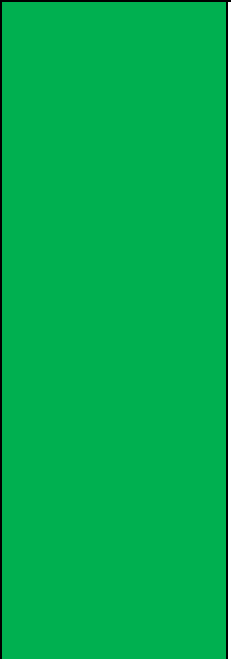
**To plan a fair test.
To make simple predictions.
To write a conclusion**

Carrier Bag Investigation.

Introduce children to the idea that they will be investigating the strength of bags. Discuss as a class how they might do this. Bring in two carrier bags both full of shopping but one has the handles stretched and about to break, the other is still in shape. Ask the class to compare the two and say which one they think is the strongest and why. Ask a couple of children to come and hold the bags and say what it feels like on their hand, e.g. one seems to cut into the hand and is uncomfortable.

Use the results from the observations made here to make predictions and set up further comparative and fair tests. Children carry out these fair tests so that they can use their data to give reasons for the use of

		<p>specific materials. This is different from children stating that, for example, a plastic bag is used because it is light or waterproof. At the end of this activity, the children should be able to give reasons for the material being used by referring to their test data. Children could use either ordinary plastic shopping bags or mini bags, the latter can be better because some of the large plastic bags hold a huge amount of weight, more than you might have available in the classroom. Some children could use Activity Resource 2.2, others could create their own plan to answer the question: 'Which material makes the strongest carrier bag?' Work with children to help them recognise that the question gives clues as how to carry out their activity, e.g.:</p>
<p>Science Lesson 4</p>	<p>L.O. Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets.</p>	<p>Bring in a range of thermal insulators, e.g. woolly socks, scarves, gloves, hot drink cups, flask and a hot water bottle with a cover, and ask children to work out what they all have in common. Alternatively, you could add an 'odd one out' such as a T-shirt and ask: 'Which one is the odd one out and why?'</p> <p>Begin asking children to think back to Year 4 when they sorted materials into those that conducted electricity and those that did not – insulators. Electrical insulators allowed electricity to pass through easily, and electrical insulators did not allow electricity to pass through easily. Give them a selection of materials to sort, to see how many remember which materials are electrical conductors and which are electrical insulators. They could check their own responses by placing them in an electrical circuit.</p> <p>Tell children that they are going to find out about a different kind of conductor and insulator, materials that are thermal conductors and insulators. Ask them to use a dictionary to look up the word 'thermal' and then discuss with their partner or in a group what they think a thermal conductor is and what they think a thermal insulator is.</p> <p>As a class create a definition of a thermal conductor, e.g. material that can transfer (move) heat from one object to another or away from your hand to the object. If a material is not a good thermal conductor, it is a thermal insulator (remind children of electrical conductor and electrical insulators). This can be quite challenging for children to understand, so ensure that they do before you move on to the activity.</p> <p>Give children lots of different objects made from metal, plastic and wood and ask them to sort them into thermal conductor, thermal insulator. What do they notice? Metal is a thermal conductor, it moves heat from our hands so it feels cold. Wood is a poor conductor, heat is not transferred away so it feels warm.</p>
<p>Science Lesson 5</p>	<p>TESTING MATERIALS – WHICH MATERIALS ARE THERMAL CONDUCTORS</p>	<p>Give each group a range of kitchen items from oven gloves and saucepans to chopping boards and ask them to find as many different ways of classifying them as they can using scientific words.</p>

	<p>AND WHICH ARE THERMAL INSULATORS?</p> <p>To plan a fair test To make predictions To present results in a variety of ways To Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p>	<p>Give children a collection of plastic, metal and wooden spoons. Ask them to predict which are thermal conductors and which are thermal insulators and why they think that. Have the children put the spoons into a jug of warm water (or you can do a teacher demonstration).</p> <p>The metal transfers the heat from the water, the heat travels through the metal and so the metal spoon feels warm, while the plastic and wood do not conduct the heat and so the heat does not travel through the wooden spoon to the hand. Then ask children how they could test their predictions using the following resources: Hand-hot water Beakers Spoons Digital thermometers</p> <p>Working in pairs or small groups of no more than four, ask children to draw an annotated diagram to show how they would carry out their comparative test. Some children will probably suggest placing the spoons into beakers of hand-hot water and feeling each spoon, others might suggest placing a digital thermometer against each spoon to see if there is a difference in temperature between each spoon. If so then they should use a table to record results. Once children have their results and used them to decide whether their original predictions were correct, then use PowerPoint Slides 6 and 7 to challenge them to apply what they have learned about materials and thermal conductors and insulators. 436114_02_Science_Y5_TG_021-036</p>