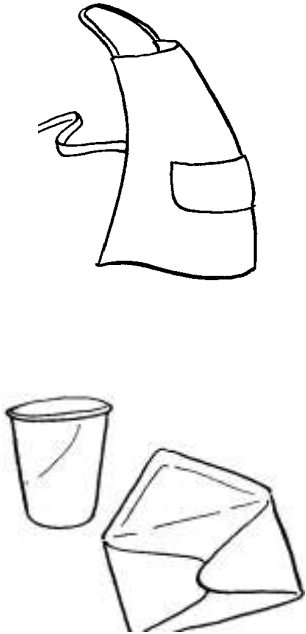


Week 1 – Classifying materials

Focus + Resources	Lesson Notes
<p>Objectives</p> <ul style="list-style-type: none"> To demonstrate knowledge of different properties of materials To have classified materials according to these properties and identified objects made from them <p>Key Idea We can classify materials according to their properties</p> <p>Resources</p> <ul style="list-style-type: none"> Science Bug International Topic Book - Materials Science Bug International Workbook – Materials Why is ice slippery? Awesome Matter and Materials Properties of Materials School Dictionary Write a Riddle Sheet 1.1 from Term 1 Appendix <p>Equipment and materials From WES Maths Kit sticky notes</p> <p>From home magnet; torch; cups of water; droppers; different types of wood, metal, plastics, fabrics, papers, brick, ceramics and rocks</p> <p>Vocabulary Check words in Word box on pages 1 and 2 in the Topic Book.</p> <p>There is no Extension work this week as there is a great deal to focus on in the lesson. Encourage your child to read the additional topic books in any spare time.</p>	<ul style="list-style-type: none"> What is material? Ask your child what she understands by the term material. Confirm that material does not mean only fabric but that material means <i>the stuff that things are made from</i>. Explain to your child that all materials are made up of atoms. Atoms are made up of smaller particles such as protons and electrons. Different atoms combine to make molecules which then combine to make up other materials called compounds. How the atoms behave and interact defines what type of matter an object is made of. There are three main States of matter – Solids where the atoms are closely packed together and the shape is fixed; Liquids where the atoms are loosely attached and the material can take on the shape of the container; and Gases where the atoms aren't attracted to each other and the material can expand to fill any container. Share <i>What are materials?</i> On pages 4-5 of <i>Why is ice slippery?</i> to confirm this. Let her continue to read about the building blocks of materials and about atoms and molecules on pages 6-9. Discuss what she has found out that she didn't know before. Exploring properties of materials. Explain that one way to describe a material is to list its properties. Write a list of the following properties on a sheet of paper: <i>hardness, absorbency, solubility, transparency, electrical conductivity, thermal insulation and magnetic behaviour</i>. Discuss the fact that you will be exploring materials with these properties during this topic. What is a material? Turn to page 1 of the <i>Materials Topic Book (Materials)</i> and ask your child to read section 1. Let her write the definition for a younger child as asked on page 1 in the <i>Materials Workbook</i> and discuss what she has written. Materials in the home. Let her draw the picture of the inside of your house in the Workbook and label it as requested. The Quest. Introduce your child to the Quest. Imagine that an aunt has moved in with your family and that she is allergic to your pet guinea pig. The guinea pig will have to move outside. Talk about the fact that the cage where he lives inside the house would not be suitable for him outside, so your child will need to design a new outdoor shelter. Explain that at the end of the unit, she will need to design this shelter listing the materials she would use and giving reasons for her choices. Materials for toys. Turn to page 2 of the <i>Materials Topic Book</i>. Ask your child to recap on the properties of materials, without looking at the list you made first of all and then checking back at this list. Ask her to fill in a brief description of different properties on page 2 in the Workbook.

<p>Week 1 continued</p> 	<ul style="list-style-type: none"> • Discuss the properties that would be needed for each of the toys shown. Ask her to record three properties that would be needed for each toy on page 2 in the Workbook. Discuss the differences between the different materials. Let her look up the definitions in the dictionary and discuss what she has found. • Sorting materials. Ask your child to turn to page 3 in the <i>Materials Topic Book</i> and find the different materials shown at the top of the page. She will also need items made of wood, metal, fabric and something made of ceramic, stone or rock. Let her suggest ways you could sort the materials in different ways. Could she use the magnet to help with this? What would she need to do to each sample? Such as try to bend it, bang something with it (gently!), look at how many different materials are used in this object? Leave her to sort the materials and then discuss how she has sorted them and ask her to note the different ways they are sorted (eg into plastics, metal etc or into hard, soft etc). Then ask her to sort them again in a different way and discuss this. She should record what she has done on page 3 in the Workbook. • Properties of materials. Ask your child to read about the properties of hardness and heaviness on pages 12-17 of <i>Awesome Matter and Materials</i> and the property of elasticity on pages 20-21. Read also about Hard and Soft Materials on pages 6-7 in <i>Properties of Materials</i> and Materials that Bend and Stretch on pages 12-13. Discuss how these properties relate to the materials she has found around your classroom and home in general. • Materials riddles. Read the riddle on page 3 of the <i>Materials Topic Book</i> together and then let your child choose another material and write a similar riddle – without the last line - in the Workbook. Can you (or another child) guess what it is? If you are working alone with your child, then write another riddle yourself and see if she can guess the material. If you are working with more than one child, let them take turns to write and guess a riddle. <i>Write a Riddle</i> in the Term 1 Appendix presents a longer riddle on a familiar pattern and some tips on writing riddles. Let your child follow this to write two or more longer riddles of her own. Find a volunteer to see if they can guess the materials. Suggest that your child writes or types out two or three riddles on paper, drawing the objects relating to each so that a volunteer can add a line to join the riddle to the object.
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Week 1 – Additional Teaching Points

Preparation for the lesson

- A number of samples of materials are suggested in the *Materials Topic Book*. It is not essential to have all of these but try to include a range of objects made of different types of material. These should include some that are very hard – such as metal, ceramics, bricks – some that are soft, some absorbent and some with elasticity.

- If you are following the WES English course, then your child should use the School Dictionary to look up definitions. Otherwise, you will need to provide a suitable children's dictionary for her to use.

Teacher tips

- As the activities in the Science Bug International course are designed for classroom use, a number of the activities in the Topic Books ask children to work with a partner or in a group. If you are working with more than one child, then follow the suggestions as set out. If you are working on your own with your child, you will often need to act as the partner yourself and ignore references to groups. If you are working with another older or younger child, you may be able to include them in some of the activities, but make sure that it is the Year 5 child who is taking the lead.
- You have four additional topic books to use during the two topics this term, *Why is ice Slippery? and other questions about materials*, *Awesome Matter and Materials*, *Properties of Materials*, and *Amazing Materials – Solids Liquids and Gases*. All of these contain interesting information but not all of it will be relevant to the topics. However, your child may enjoy reading through the books during the topic work. Some pages are mentioned specifically in the lesson notes but do encourage your child to use the books to follow up the material in the topic books and to answer questions you may be discussing during the lessons. Some of the books will also be used for the second topic this term, *Separating Mixtures* and some also for the first topic in Term 2, *Types of Change*. Suggest that your child reads about Materials through the Ages on pages 4-5 in *Properties of Materials* during this week as background information to the topic.
- As well as the additional topic books you have a *Science Encyclopedia*. This is designed for Key Stage 2 children and will help your child to read further about a topic and also to undertake some independent research. The information in the first two chapters is relevant to work during this term. Encourage your child to use the Index to find out information to back up what is covered in the topic work.
- The table on pages 12-13 of *Awesome Matter and Materials* shows details of the hardest and softest materials and it would be helpful to browse through these pages together during this week and keep them for reference during the topic.

Extend

Choose more difficult materials/properties for your child to sort. Encourage more complex records of material classification.

Answers

You will find an Answers section in the Teacher Tips for each week's work. Some answers are suggested within the Lesson Notes but any further answers are included here. In the answers for Weeks 1-6, Topic Book refers to the *Materials Topic Book* and Workbook refers to the *Materials Workbook*. Answers to any Extension activities or activities in the Appendix are towards the end of the Term 1 Appendix.

Topic Book Page 1: For example, the stuff that objects are made out of.

Cage not suitable - The cage is not made out of materials that offer enough protection and thermal insulation. It is not waterproof and there is not enough warm bedding.

Page 2: The list of properties should include *absorbent, waterproof, soft, hard, strong, weak, brittle, flexible, thermal conductor, thermal insulator, electrical conductor, electrical insulator, soluble, solid, liquid, gas, magnetic, opaque, translucent and transparent*.

Week 1 continued

Workbook Page 2 Question 1: descriptions for younger child: **Hard**: solid, firm and not easy to break, cut or put holes in. **Absorbent**: able to soak up liquid easily. **Soluble**: able to dissolve especially in water. **Transparent**: lets light through, see-through. **Electrical conductor**: allows the flow of electricity. **Thermal insulator**: prevents the loss of heat; any material that does not let heat travel through it easily. **Magnetic**: magnetic material pulls some metals towards it without touching, can push other magnetic materials away without touching.

Question 2: A trampoline is elastic and flexible. A bike is hard and strong. A teddy is soft and flexible. However other properties may be listed e.g. all are opaque.



WRITE A RIDDLE

You can write a riddle about any kind of material.

Read this one and decide what material is the answer?

- In your hair and in your hand
- I bounce and stretch at your command.
- I come from the sap of broken trees
- and wipe away your words with ease.
- I keep you safe when you're out to play
- and keep you dry on a rainy day.
- What am I?

Now try writing some riddles of your own.

These tips will be useful in helping you write the riddle:

- Start with the answer.
- Think about what is special or unusual about that material.
- Write down as many things as you can about it.
- Think about sound, touch, taste, smell and sight.
- Find a simile or metaphor for your material.
- The riddle doesn't have to rhyme, but if you want it to, go through your notes and pick out words that rhyme or rhyming words for words already there.
- You could use alliteration instead of rhyme (where lots of words all start with the same letter).

Think of two or three different material riddles. Write or type your riddles on paper then draw the materials they relate to - somewhere away from the riddle itself. See who can link the object to the riddle.