

Topic:	Year group	Term
Materials	2	Autumn 2

Background knowledge

This unit builds on the work done in year one where children identified different materials and their properties by relating the properties a material has to its use. Material munchers could be made using boxes and packaging with pre-cut letter box mouths to sort items made of different materials e.g. metal muncher (foil, nuts, bolts, screws, coins etc.) , wood muncher (lolly and cocktail sticks, twigs, tree bark). Higher order thinking skills can be developed by using activities such as positive, minus and interesting when considering a chocolate tea pot for example or odd one out where a range of materials are shown and they would have to identify why each material would be the odd one out. They could also think of the most ridiculous object that could be made out of a material e.g. a glass football. Riddles and rhymes could also be used to identify materials; I could be a bottle bobbing about in a fast flowing stream. I could be a spoon mixing and stirring delicious porridge, I could be the last block in a toppling tower. I could be a Frisbee swirling through the air. What material am I? The children could then go on to write their own.

Common misconceptions

- Children may think that all solid materials are hard.
- Children may think that all solid materials are heavy.
- Children may think that no solid materials will change shape if a force acts on them.
- Children may think that if a solid material changes shape, it cannot change back to its original shape.
- Children may think that objects can only be made from one material.
- Children may think that fabrics are not materials.
- Children may think that natural fabrics, such as wool and cotton, are not fabrics.
- Children may think that all metals are heavy.
- Children may think that all metals are rigid.
- Children may think that all metals are silver in colour.
- Children may think that glass and plastic are the same material as they have a lot of similar properties.
- Children may think all plastic is hard.
- Children may think that all rocks are heavy.
- Children may think that all rocks are hard and cannot be broken easily.
- Children may think that rocks and stones are different materials.
- Children may think that all paper has the same thickness and texture.

- Children may think that the term “material” is only used for objects inside the classroom such as toys or equipment.
- Children may think that all materials are human-made.

What should I already know?

In Year 1, children explored a range of familiar materials and carried out simple tests to explore floating, sinking, melting and absorbency, as well as transparent and opaque materials.

In Year 1, they explored texture and felt a range of fabrics with different parts of their body.

National Curriculum Objectives / Key Skills	The Journey
Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. <u>Working scientifically</u> Identifying and classifying. Performing simple tests. Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (non-statutory). Asking simple questions and recognising that they can be answered in different ways. Observing closely, using simple equipment.	1. Explore materials 2. Wood, paper and cardboard 3. Brick and rock 4. Glass and plastic 5. Metal 6. Fabrics 7. Same object, different material 8. Test materials - bend, squash, twist and stretch 9. Plan - waterproof experiment 10. Investigate - waterproof experiment TAPS - Materials Hunt -Do - Gather and record Handspans Plan - Design and ask questions

Using their observations and ideas to suggest answers to questions.

Scientific enquiry



Outcomes

Working towards: I can identify a range of different materials and state some of their properties. I can say which material is most suitable for a specific purpose. I can make a prediction. I can perform a simple test recording my findings in a simple table with support. I can say which material I think would be best for a specific purpose. I can say why a material can or cannot be used for a specific purpose. I can change some materials by squashing, bending, twisting and stretching. I can state the material a famous scientist has developed with help.

Expected: I can identify a range of different materials and state their properties. I can say why a material is suitable for a specific purpose making reference to its properties. I can make a sensible prediction. I can perform a simple test recording my findings in a simple table. I can say which material would be useful for a specific purpose using my results. I can say why a material can or cannot be used for a specific purpose giving reasons. I can recognise that some materials can be changed by squashing, bending, twisting and stretching and identify some that can't. I can state the material a famous scientist has developed.

Exceeding: I can identify a range of different materials and state their properties. I can say why a material is suitable for a specific purpose giving reasons related to its properties. I can make a reasoned prediction. I can perform a simple test independently recording my findings in a table. I can say which material would be useful for a specific purpose using my results and giving a reason why. I can say why a material can or cannot be used for a specific purpose referring to their properties. I can recognise that some materials can be changed by squashing, bending, twisting and stretching and identify some that can't suggesting why. I can state the material a famous scientist has developed and state some facts about them.

Key Vocabulary

Names of materials; wood, metal, plastic, glass, brick, rock, paper, cardboard.

Types of movement; push/pull, twist, squash, bend, stretch.

Absorbent; able to soak up a liquid.

Flexible; can be bent.

Manufactured; a new material made by humans.

Material; something an object is made of.

Natural; a material found in the local environment.

Opaque; doesn't allow light through.

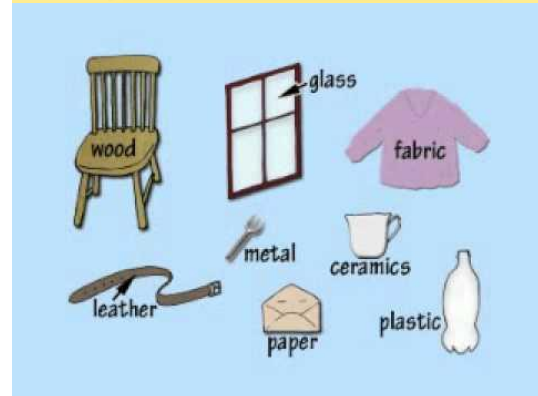
Property; a quality of a material.

Rigid; can't be bent.

Translucent; allows some light through.

Transparent; allows light through.

Timeline / Diagrams



Materials

There are lots of different types of materials and they all have different **properties**. They can be...

hard **SOFT** **TRANSPARENT**

STRONG **flexible** **OPAQUE**

brittle **compressible** **RIGID**

STRETCHY **HEAVY** **light**

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How would you describe these materials?

Key people / places

Stem career; Materials engineer, Megan Orrr - Senior laboratory technician
Famous scientists; John Dunlop (Tyres), John McAdam (road builder).

Question of the week

Lesson 1

Question of the week

Draw lines to match the objects to how they were made:

man-made

natural



Lesson 2

Question of the week

Diddy is thinking about paper, wood and cardboard.



I want to make a chair.
I am going to use cardboard
because then I can move the
chair easily.



Diddy

Do you agree with Diddy? _____

Why? _____

Lesson 3

Question of the week

Max has a house made from bricks.



Is brick a good material to use to build
a house? _____

Why? _____

Lesson 4

Question of the week

Max and Ron are designing a toy.



I think we should make the toy from glass, because it is transparent and colourful.



I think we should make the toy from plastic, as it is light and does not break easily.



Who do you agree with? _____

Why? _____

Lesson 5

Question of the week

Why does foil need to be flexible?



What does rigid mean?

Lesson 6

Question of the Week

5 Kim and Ron are talking about what fabric to use to design a PE kit.



I think it needs to be flexible, light and easy to wash.



I think the fabric for a PE kit needs to be heavy and stiff.



Who do you agree with? _____

Why? _____

Lesson 7

Question of the Week



bend

twist

stretch

squash