



**Enquiry: Can we change materials?
How do we choose the best material?**

Year: 2

Strand: Chemistry

Prior Knowledge

- Distinguish between an object and the material from which it is made. (Y1 - Everyday materials)
- Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials)
- Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials)
- Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)

What will I know by the end of the unit? Substantive Knowledge

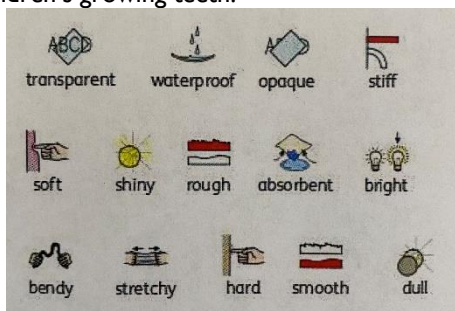
What are materials used for?

Materials are used for different purposes based on their properties.
For example, wood is used to make furniture and floors.
Metal can be used to make coins, cans, cars and cutlery.
Glass can be used to make windows



What properties of materials make them suitable for a particular use?

Glass can be used to make windows because it is transparent.
Rulers can be made from wood, plastic or rubber because these materials are smooth and can be cut straight.
Spoons are made from metal, because it is waterproof and can be cleaned easily.
They can also be made from plastic for children because plastic is light and it cannot hurt children's growing teeth.



How can you change the shape of materials?

The shape of some materials can be changed when they are stretched, twisted, bent and squashed

Vocabulary

fabrics	cloth or other material produced by weaving together cotton, wool or other threads
man-made	things are created by people
natural	things that exist in nature and are not made by people
natural	things that exist in nature and are not made by people
opaque	if an object or substance is opaque, you cannot see through it
transparent	If an object is transparent, you can see through it
waterproof	does not let water pass through it
absorbent	material that soaks up liquid easily
plastic	a synthetic material that can be moulded into shape while soft, and then set into a rigid or slightly elastic
glass	a hard, brittle substance, typically transparent used to make windows, drinking container etc,
wood	the material which forms the trunks and branches of trees
brick	rectangular blocks of baked clay used for building walls, which are usually red or brown
foil	sheets of metal as thin as paper
rock	the hard substance which the Earth is made of
dull	a colour or light that is not bright
shiny	things are bright and reflect light
rough	uneven and not smooth
smooth	no roughness, lumps, or holes
stretchy	slightly elastic
stiff	firm or does not bend easily
bendy	an object that bends easily into a curved shape
properties	the qualities or features that belong to something and make it recognisable
suitable	something that is suitable for a particular purpose or occasion is right or acceptable for it
unsuitable	Someone or something that is unsuitable for a particular purpose or situation does not have the right properties for it

Learning Objectives

- 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.



John MacAdam (roads)

Possible Activities

- Compare the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs)
- Observe closely the uses of different materials, and record your observations.
- Distinguish between absorbent and waterproof materials. Discuss what happens when water is placed on these materials.
- Consider why some properties of materials make them suitable or unsuitable for different uses.
- Investigate if some items can be made by more than one material (e.g. cutlery) and explain why.
- Investigate if some materials can be used to make more than one thing.
- Discuss which materials are recyclable and why. Follow the recycling process.
- Investigate how some objects can be changed by squashing, bending, twisting and stretching.
- Find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam

Possible Evidence & Assessment Opportunity

- Can name an object, say what material it is made from, identify its properties and make a link between the properties and a particular use
- Can label a picture or diagram of an object made from different materials
- For a given object can identify what properties a suitable material needs to have
- Whilst changing the shape of an object can describe the action used
- Can use the words flexible and/or stretchy to describe materials that can be changed in shape and stiff and/or rigid for those that cannot
- Can recognise that a material may come in different forms which have different properties
- Can sort materials using a range of properties
- Can explain using the key properties why a material is suitable or not suitable for a purpose
- Can begin to choose an appropriate method for testing a material for a particular property
- Can use their test evidence to select appropriate material for a purpose e.g. Which material is the best for a rain hat?
- Can we change materials?
- How do we choose the best material?

Possible Misconceptions

Some children may think:

- only fabrics are materials
- only building materials are materials
- only writing materials are materials
- the word rock describes an object rather than a material
- solid is another word for hard.

Future Learning

- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. (Y3 - Rocks)
- Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets)
- 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. (Y5 - Properties and changes of materials)
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. (Y5 - Properties and changes of materials)

Questions

Which rocks are the least crumbly?
Which materials absorb the most water?
Which material would be the strongest to use as a floor tile?

Texts

Three Little Pigs (Lesley Sims)

Working Scientifically (Disciplinary Knowledge)

Perform simple comparative and fair tests
Ask simple questions and recognise that they can be answered in different ways including use of scientific language from the national curriculum
Use simple equipment such as thermometers and rain gauges to observe closely changes over time
Gather and record data to help in answering questions including from secondary sources of information using drawings, labelled diagrams, block graphs or tables
Communicate his/her Ideas, what he/she does and what he/she finds out in a variety of ways e.g. simple written reports or write ups.
Identify, group and classify according to a given criteria
Use observations and ideas to suggest answers to questions noticing similarities, differences and patterns

End Points and Assessment of Core Learning

Working Scientifically
I can ask simple questions and recognising that they can be answered in different ways.
I can use simple equipment to make observations.
I can carry out simple tests.
I can identify and classify things.
I can gather and record data to help in answering questions.
I can use observations and ideas to suggest answers to questions.

I can identify and name a range of materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard.
I can compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
I can explore how shapes can be changed by squashing, bending, twisting and stretching.

Start of Unit	End of Unit
Question 1: Which of these materials can absorb water? a) Plastic b) Brick c) Fabric d) Metal e) Don't know	Question 1: Which of these materials can absorb water? a) Plastic b) Brick c) Fabric d) Metal e) Don't know
Question 2: Which of these materials is waterproof? (circle 2) a) Wax b) Wool c) Paper d) Plastic e) Don't know	Question 2: Which of these materials is waterproof? (circle 2) a) Wax b) Wool c) Paper d) Plastic e) Don't know
Start of Unit	End of Unit
Question 3: Which of these objects change shape after they have been squashed? (circle 2) a) Plasticine b) Sponge c) Spring d) Dough	Question 3: Which of these objects change shape after they have been squashed? (circle 2) a) Plasticine b) Sponge c) Spring d) Dough

e) Don't know	e) Don't know
Question 4: Which of these objects have the property of elasticity? (circle 2) a) Rubber band b) Ruler c) Balloon d) Paintbrush e) Don't know	Question 4: Which of these objects have the property of elasticity? (circle 2) a) Rubber band b) Ruler c) Balloon d) Paintbrush e) Don't know