

Science

Year 2

The suitability of everyday materials for their uses

What did Charles Macintosh do?

Prior Knowledge/ Prior Skills:

- 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)

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)

Planned outcome:

- 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.

Misconceptions

- 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.

Learning to Assess

All objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water. When choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities. A material can be suitable for different purposes and an object can be made of different materials.

Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. For example, clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g. thickness.

Possible Evidence

- 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

Step 1

Investigate which materials are the most absorbent
Understand what absorbent means

Step 2

Test a material to see whether it is waterproof

Umbrella Investigation

To perform simple tests to find out which material would be suitable to make an umbrella from.
I can test different materials.

To use their observations and ideas to suggest answers to questions by deciding which materials would be suitable to make an umbrella from.

I can use what I have learnt to make a decision.

Step 3

Investigate which materials are opaque and which are transparent
Focus: understanding the words: transparent and opaque

Step 4

Investigate how objects can be changed by squashing, bending, stretching and twisting.

Step 5

Who Charles Macintosh is and why he is important

Move to Year 2 coverage

Step 5. Umbrella Investigation To observe closely by watching what happens to teddy. • I can watch closely. To perform simple tests to find out which material would be suitable to make an umbrella from. • I can test different materials. To use their observations and ideas to suggest answers to questions by deciding which materials would be suitable to make an umbrella from. • I can use what I have learnt to make a decision.

Tiered Vocabulary

opaque, absorbent, waterproof, transparent

Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching

Scaffolds/Enquiry Activities

- Classify materials.
- Make suggestions about alternative materials for a purpose that are both suitable and unsuitable
- Test the properties of materials for particular uses e.g. compare the stretchiness of fabrics to select the most appropriate for Elastigirl’s costume, test materials for waterproofness to select the most appropriate for a rain hat

Oracy Activities

- sort materials using a range of properties

Maths link:

Find out how shapes of solid objects can be changed by squashing, bending, twisting, stretching

Measuring, comparing, patterns

Material Manipulation Stations:

Experiment with bending, squashing, twisting and stretching different materials and record observations.

Samples of materials (plastic, foil, rubber bands, paper), worksheet, rulers

- explain using the key properties why a material is suitable or not suitable for a purpose
- begin to choose an appropriate method for testing a material for a particular property
- use their test evidence to select appropriate material for a purpose e.g. Which material is the best for a rain hat?