Science

Properties and Changes of Materials

Properties of Materials

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Aim

- I can compare materials according to their properties.

Success Criteria

- I can describe a material's properties.
- I can explain the uses of different materials based on their properties.
- I can sort and compare materials according to their properties.

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Describing Materials

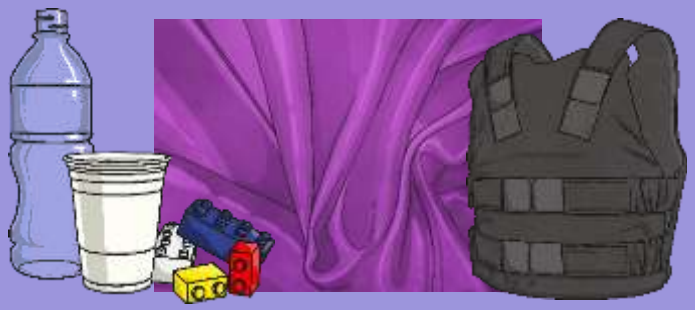
Any substance that is used to make something is a material.

Natural materials such as stone, wood and cotton are used or worked with in the way they are found in nature.

Synthetic or man-made materials are made from natural materials, but are altered with the help of heat or chemicals. Some examples include plastics, polyester and Kevlar.

Natural

Man-made



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Describing Materials

Around your classroom you will see several feely bags.
In each bag is a material. Can you identify the different materials just by feeling them?

While you have a go at this activity, think of words to describe each material, such as hard, soft, cold or rough.

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Describing Materials

Whole Class

Have a look inside the feely bags.
Were you right about any of the materials?
What words did you think of to describe each material?

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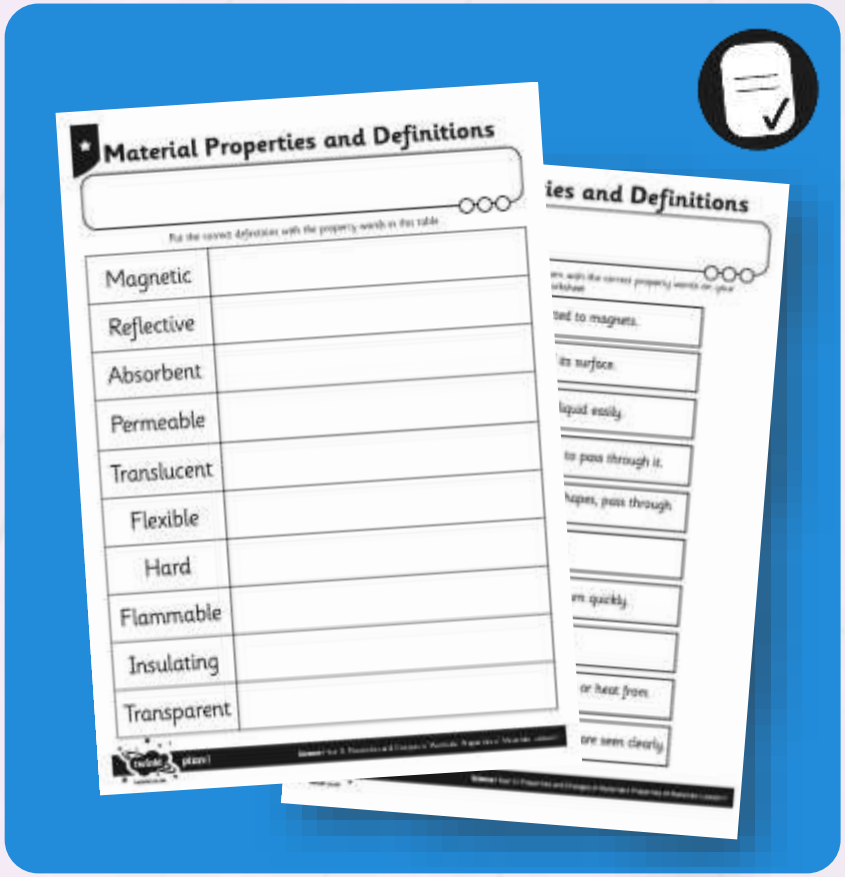
Properties

The words used to describe a material are known as its properties.

Each material has its own set of properties.

These properties make different materials useful for different purposes.

Can you match the properties with their definitions on your Material Properties Activity Sheet?



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Using Materials

Why is it useful to know the properties of a material?

It is useful because if you know the properties of a material, you can then choose the best material for a purpose.
Look again at the objects from the feely bags. Why was each material chosen to make these things?

Talk to your partner about your ideas.

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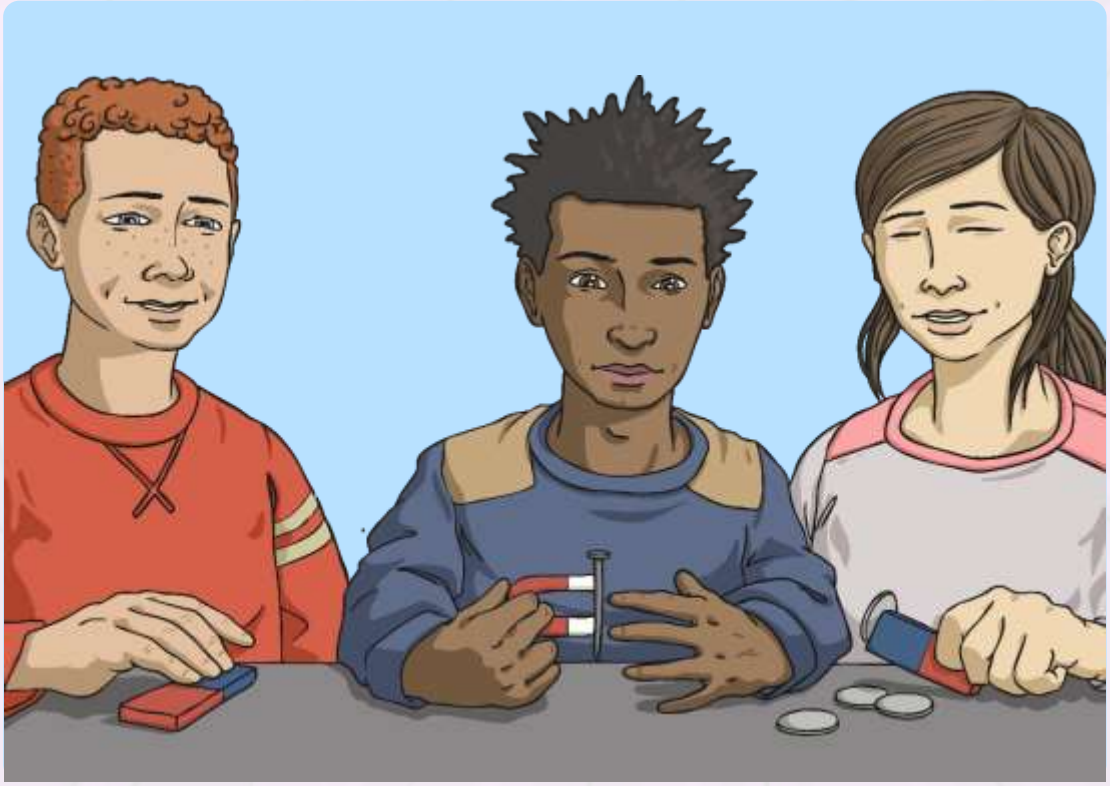
Testing Properties

To find out which properties a material has, they have to be tested.

You are going to test several different materials to find their properties.

You will test for:

- magnetism;
- hardness;
- transparency;
- flexibility;
- permeability.



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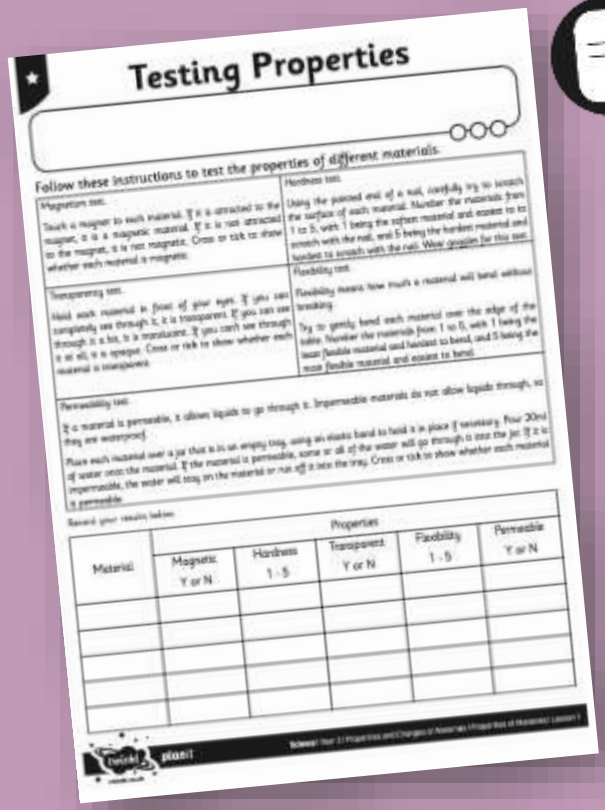
Testing Properties

Follow the instructions for each test, and try out each test with each material.
Complete your Testing Properties Activity Sheet with your results.



Testing Properties

Follow these instructions to test the properties of different materials.

Magnetism test:
Touch a magnet to each material. If it is attracted to the magnet, it is a magnetic material. If it is not attracted to the magnet, it is not magnetic. Cross or tick to show whether each material is magnetic.

Hardness test:
Using the pointed end of a nail, carefully try to scratch the surface of each material. Number the materials from 1 to 5, with 1 being the softest material and easiest to to scratch with the nail, and 5 being the hardest material and hardest to scratch with the nail. Wear goggles for this test.

Transparency test:
Hold each material in front of your eyes. If you can see completely see through it, it is transparent. If you can see through it a bit, it is translucent. If you can't see through it at all, it is opaque. Cross or tick to show whether each material is transparent.

Flexibility test:
Flexibility means how much a material will bend without breaking.
Try to gently bend each material over the edge of the table. Number the materials from 1 to 5, with 1 being the most flexible material and hardest to bend, and 5 being the most flexible material and easiest to bend.

Permeability test:
If a material is permeable, it allows liquids to go through it. Impermeable materials do not allow liquids through, so they are waterproof.
Place each material over a jar that is in an empty tray, using an elastic band to hold it in place if necessary. Pour 20ml of water onto the material. If the material is permeable, some or all of the water will go through it into the jar. If it is impermeable, the water will stay on the material or run off it into the tray. Cross or tick to show whether each material is permeable.

Record your results below:

Material	Properties				
	Magnetic Y or N	Hardness 1 - 5	Transparent Y or N	Flexibility 1 - 5	Permeable Y or N

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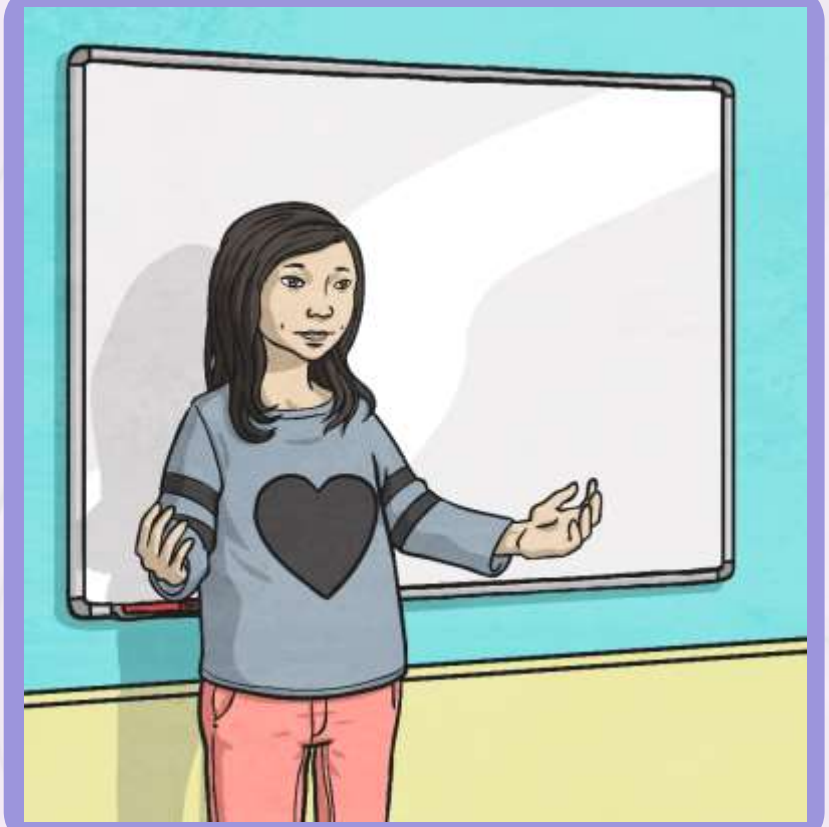
Properties and Purposes

Whole Class

Some of you have been thinking of uses for the different materials based on their properties.
Share your ideas with your class, who will feedback their thoughts.



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