

Year Five

Term - Summer One

Science

Unit: Get sorted

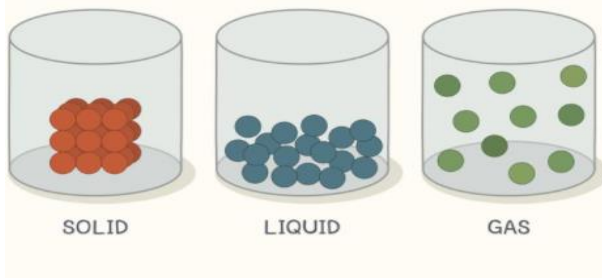
What I should already know?

There are three states – solid, liquid and gas:

Solids retain their shape when transferred from place to place unless a force is applied to them, for example, to cut or shape them. They have constant volume. This is because the particles making up the solid are held in a tight structure where they can vibrate but cannot move in relation to each **other**.

- **Liquids** when transferred from place to place take the shape of the container they are in but do not change in volume. The surface of a liquid will remain horizontal when the container is tipped. The particles in a liquid remain in contact with each other so the liquid cannot be compressed, but they are more loosely bound and so can move in relation to each other, allowing changes of shape.

- **Gases** change in shape and volume to fill the space they are in. The particles in a gas move freely so, under pressure, the gas will take up less space.



Main driver question

What materials can I identify according to their properties and uses?

Mini driver questions

1. How can we compare and group materials?
2. Is a solid always hard?
3. Is a liquid always runny?
4. Are all metals the same?
5. Are all plastics the same?
6. **Essay Week: Can you answer the main driver question?**

Key Vocabulary:

properties, material, solid, liquid, gas, compare, contrast, group, organise, criteria, hardness, soluble, insoluble, transparent, transparency, opaque, hardness, strength, rigidity, flexibility, elastic, elasticity, ductile, electrical conductor/insulator, thermal conductor/insulator, magnetic, non-magnetic, attract, repel, viscosity, viscous, thick, thicker, types of plastic – polyester, nylon, polythene, PVC, polystyrene acrylic – recycle, reuse, biodegradable, environmentally friendly

Did you know?

Conductors and insulators : A conductor is a material that transmits something like electricity or heat well. An insulator is a material that does this less well or not at all. Metals are very effective thermal and electrical conductors. Plastics and woods are poor thermal and electrical conductors but very good thermal and electrical insulators. Both these materials are ideal for using in contexts where heat requires insulating to protect the user, for example, for the handles of metal cooking pans or for cooking spoons that are used with hot food. However, wood may char or burn if it becomes too hot and plastic might melt – so care does need to be taken. Plastics are also used to insulate cables and plugs on electrical appliances and in the wiring of our homes, specifically because they are such effective electrical insulators.



What I should know at the end of the unit?

Bronze: You should be able to answer some of the mini driver questions in each lesson and write 2 paragraphs for your Main driver question.

Silver: You should be able to answer all mini driver questions in each lesson and write 3-4 paragraphs for your Main driver question.

Gold: You should be able to answer all mini driver questions in each lesson and write a full essay for your Main driver question.

Useful Websites:

<https://www.bbc.co.uk/bitesize/topics/zcvv4wx>

<https://www.hamilton-trust.org.uk/science/year-5-science/changes-materials-changing-materials-education-pack/>

<https://www.stem.org.uk/resources/elibrary/resource/35390/properties-and-changes-materials-suitable-home-teaching>

Common Misconceptions:

The word 'material' is used to describe fabric and textiles.

In science the word 'material' is a generic adjective used to describe what something is made of.

Many people believe all metals are magnetic. Only metals containing iron (including steel), nickel and cobalt are magnetic (i.e. can be attracted to a magnet).

Unusual materials and how they behave

Materials may surprise you- behaving differently and challenging your expectations.

Shaving foam: The combination of glycerine, lanolin and other chemicals gives shaving foam its extra-creamy and dense lather. It combines with a propellant (often butane or propane gas), which expands and instantly evaporates when it leaves the can, filling the foam with millions of bubbles.

Lemonade: Compressed carbon dioxide is forced into the still drink during production. When the pressure of gas inside is released, as the lid is opened, the carbon dioxide rushes to leave the liquid to equalise the pressure.

Jelly: Jelly contains gelatine, which changes state when mixed with hot water. On cooling, it sets into a semi-solid flexible mass.

Ketchup: Tomato ketchup is made from concentrated tomatoes. It is an example of a non-Newtonian fluid – liquids that get thinner or thicker when 'stress' is exerted. In the case of ketchup, it stays almost solid in the bottom of a plastic bottle until it is squeezed or shaken, at which point it squirts out easily: it is 'shear thinning'.

