No Brain Too Small ● CHEMISTRY & BIOLOGY AS92023

Demonstrate understanding of how the physical properties of materials inform their use

4 Credits External

Students are able to demonstrate understanding of how the physical properties of materials inform their use.

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of how the physical properties of materials inform their use	Explain how the physical properties of materials inform their use	Evaluate how the physical properties of materials inform their use

Demonstrate understanding of how the physical properties of materials inform their use involves:

- describing the use of materials with reference to physical properties
- describing the physical properties of materials, with reference to the arrangement of particles and the relative strength of attractive forces between the particles.

This looks like...

- *linking one or more physical properties of a material to the use of the material*
- *describing the arrangement of particles (the structure) in the material*
- *describing the attractive forces within the material (the bonding).*

Explain how the physical properties of materials inform their use involves:

- explaining the physical properties and use of the materials in relation to the arrangement of particles and the relative strength of attractive forces between them.

This looks like...

- *explaining how one or more physical properties of a material related to the use of that material*
- *linking the physical property to the arrangement of particles (structure) **or** the strength of attractive forces between particles (bonding).*

Evaluate how the physical properties of materials inform their use involves:

- evaluating how materials behave when used, by linking physical properties to the arrangement of particles in the materials and the relative strength of attractive forces between these particles.

This looks like...

- *accurately identifying the type of material used*
- *justifying the use by linking one or more physical properties to the arrangement of particles (structure) **and** the strength of attractive forces between particles (bonding).*

An examination will often only sample the standard, rather than examining all content of the standard.

Types of materials are limited to:

- ❑ molecular substances, such as water and iodine
- ❑ metallic solids, such as lead pipe, magnesium alloy wheels, and copper wire
- ❑ ionic materials, such as nitrate fertilizers and salt
- ❑ natural and synthetic polymers, such as DNA, proteins, and non-stick coatings on cookware
- ❑ covalent networks, such as diamond and graphite.

Physical properties are characteristics of matter which can be observed or measured without changing the chemical composition of the matter.

Examples of physical properties include:

- ❑ density
- ❑ thermal and electrical conductivity
- ❑ melting and boiling points
- ❑ solubility in water
- ❑ malleability and hardness.

Particles are the constituent components of materials.

Particles are limited to:

- ❑ atoms
- ❑ ions
- ❑ molecules
- ❑ electrons