



**Review:
Classification of Matter**

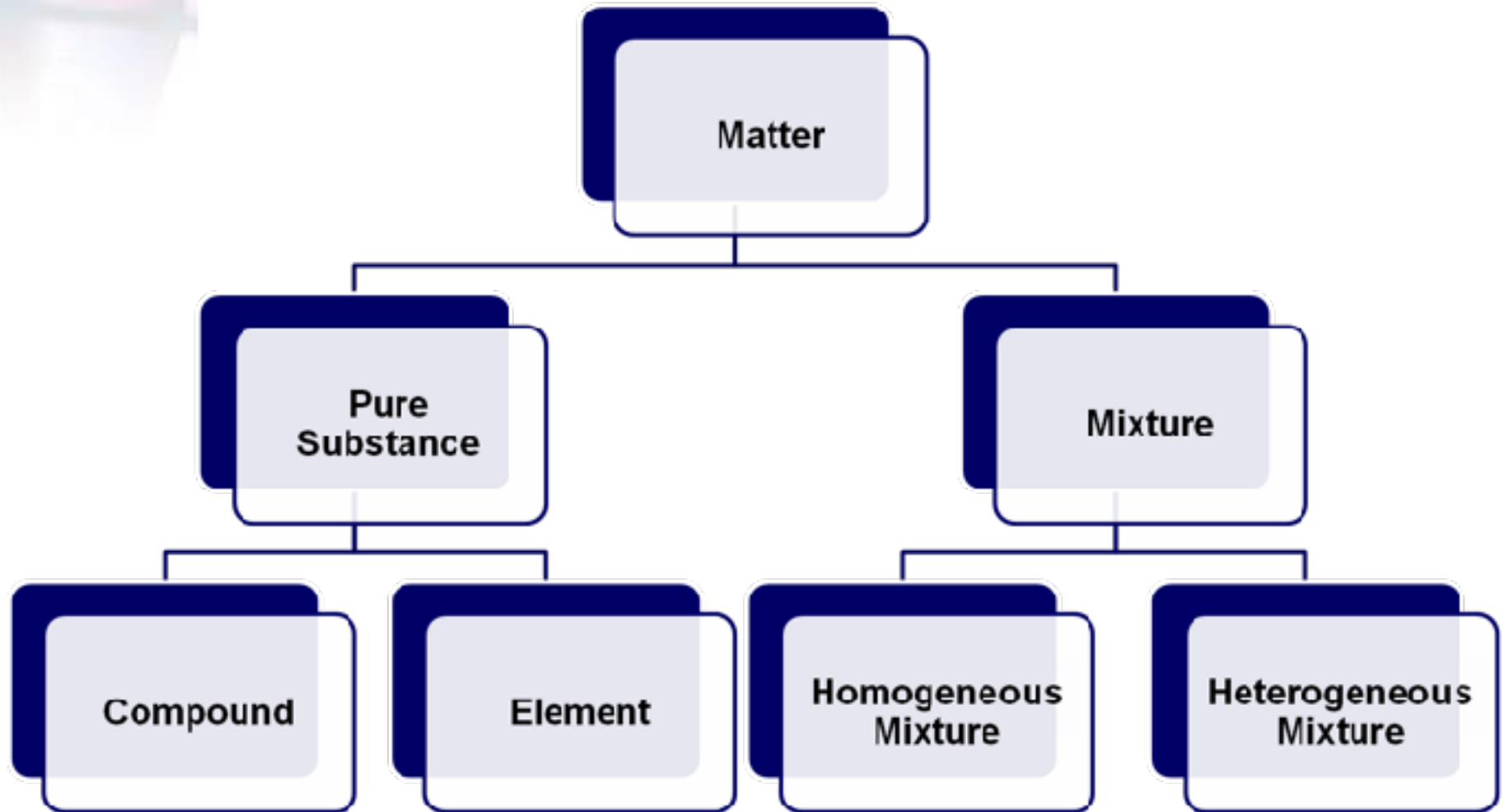


Success Criteria: I can...

- analyse how an understanding of the properties of chemical substances and their reactions
- analyse and compare the differences between substances like compounds and elements



Classification of matter





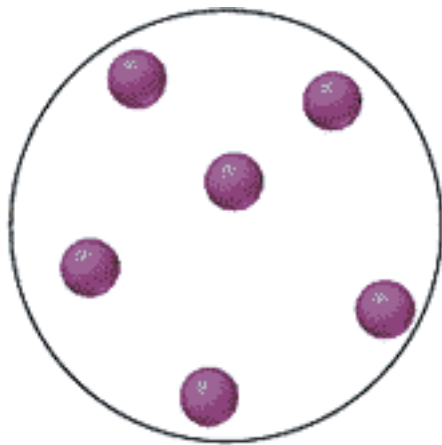
Pure Substance

- **A substance with constant composition.**
- Can be classified as either an element or as a compound.

Examples:

iron (Fe)

copper (Cu)

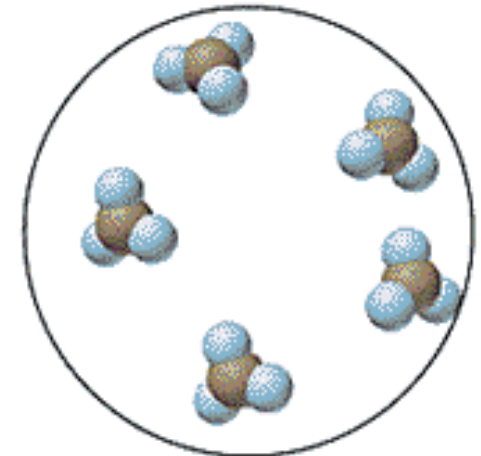


oxygen (O_2).



Table salt (NaCl)

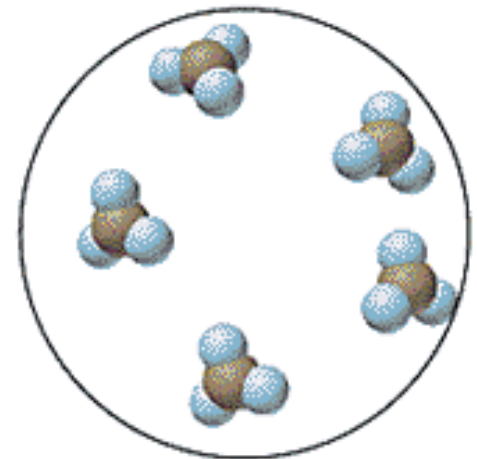
water (H_2O)





Compound

- **A substance that contains two or more elements**, in definite proportion by weight.
- Compounds are composed of more than one kind of atom.
- The term **molecule** is often used for the smallest unit of a compound.

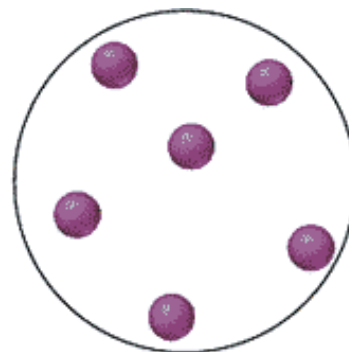




Element

- A substance that cannot be separated into two or more substances by ordinary chemical (or physical) means.
- Elements are composed of only one kind of **atom**.

Examples: Iron (Fe), Oxygen (O₂)





Mixture

- **Two or more substances, combined in varying proportions -**
- each substance has its own specific properties.
- The components of a mixture can be separated by physical means

Examples: Table salt thoroughly dissolved in water, milk, wood, and concrete.



Homogeneous Mixture

- **Mixture in which the properties and composition are uniform throughout the sample = solutions**

Examples: Air and table salt thoroughly dissolved in water



Heterogeneous Mixture

- **Mixture in which the properties and composition are not uniform throughout the sample.**
Examples: A salad, sand, stir-fry, mixed nuts.



Physical Properties

Physical Properties- The characteristics of a substance.

1. States of matter

- Solid
- Liquid
- Gas



Physical Properties

Physical property observations can be made using several senses.

- Sight
- Smell
- Touch
- Taste



Physical Properties

Colour/ appearance	Texture	Odour	Clarity	Taste
Colourless, white, black, shiny, dull,	Fine, course, smooth, gritty	Odourless, spicy, sharp, burnt,	Transparent, Translucent opaque	Sweet, sour, salty, buttery



Typical physical properties

Hardness- The measure of the resistance of a solid to being scratched or dented.

eg. Diamond > Steel nails > Glass > Chalk

Malleability- *The ability to be hammered or bent into different shapes*

- Example Aluminum foil.
- Brittle – Shatters easily



Typical physical properties

Melting and Boiling Points - The temperatures at which substances change states.

Ex Water: MP = 0°C , BP = 100 °C



Typical physical properties

Crystal Form – The solid forms of minerals

- Example – Sodium chloride = table salt

Solubility- The ability a substance to dissolve in a solvent.

- Example: salt is soluble in water where pepper is not.

Density – The amount of mass per unit volume of that matter. (kg / cm^3)



Chemical properties (3)

A chemical property describes the behaviour of a substance as it becomes a new substance



Chemical Properties

1. **Combustibility** is the ability of a substance to burn. In order to burn a substance requires Oxygen





Chemical Properties

2. Light sensitivity is a chemical property of that can cause new substances to form when light hits it.





Chemical Properties

3. Reacting with an acid (or bases) is a chemical property where when acid (base) is poured on a substance it produces a gas and bubbles.





Physical changes

In a physical change, the substance involved remains the same. The substance may change form or state, however. All changes of state are physical changes.





Clues that a chemical change has occurred (KEY!!!!)

- **Change in colour**
- **Formation of a solid (precipitate)**
- **Formation of a gas**
- **Release or absorption of heat**
- **The change cannot be reversed or it is difficult to.**



Chemical changes

In a chemical Change the substance is changed into one or more different substances. The new substances have different properties from the original substance.

[Youtube.com/7a9rian2](https://www.youtube.com/7a9rian2)

Amazing
Chemical Reactions