

1. Matter
2. Pure Substance vs. Mixture
3. Properties of Matter

Matter

Matter: anything that has mass and takes up space

- Classification of matter
 - **Pure substance:** made up of one type of particle; cannot be separated by physical means
 - **Mixture:** made up of two or more pure substances; can be separated by physical means

Matter is either a pure substance or a mixture

Mixture

Mixtures can be classified as

- **Homogeneous mixtures** (solutions): mixed uniformly; cannot see their components
 - Example: air (nitrogen, oxygen, hydrogen), steel (iron and other elements), coffee



- **Heterogeneous mixture:** have different components that you can see
 - Example: granola bar, cereal



Pure Substance

Pure substances can be classified as

- **Elements:** made up of one type of atom; cannot be broken down into simpler substances (example: gold)
- **Compounds:** made up of two or more elements; can be broken down into simpler substances (example: sodium chloride)

Periodic Table of the Elements



Properties of Matter

Matter can be described by

- **Physical properties:** characteristics that can be observed or measured without changing its chemical identity (examples: colour, texture)
- **Chemical properties:** describe the ability of matter to react with another substance to form different substances (examples: combustibility, lack of reactivity)

Physical Properties		Chemical Properties	
Colour	The colour of the substance or material	Combustibility	How easily a substance bursts into flame
Malleability	The ability for metals to be hammered or rolled into a thin sheet	Reactivity	The tendency for a substance to undergo a chemical reaction
Texture	The feel, appearance, or consistency of a surface or a substance.		
Viscosity	A measure of a fluid's resistance to flow (i.e., low viscosity flows easily)		
Conductivity	The ability to conduct/transmit heat, electricity, or sound		
State of matter	Solid, liquid, or gas		
Melting point	The temperature where a substance changes from solid to liquid		
Boiling Point	The temperature where a substance changes from liquid to gas		
Hardness	A description of how hard or soft a material is		
Solubility	The ability for a substance to be dissolved into a liquid		
Ductility	The ability of a material to have its shape changed without losing strength or breaking		

Physical Changes

- A change to physical properties of a substance.
- They are usually reversible.
- E.g.: crushing a can, shredding paper, melting an ice cube



Chemical Changes

- A process in which one or more substances are altered into one or more new and different substances.
- A chemical reaction involving the rearrangement of atoms.
- Also known as a chemical reaction.
- E.g.: cooking an egg, metal rusting, a fire burning
- Signs of a chemical change:
 - Bubbling
 - Changes in colour
 - A new substance is formed
 - Release of heat and light
 - Change in odour

