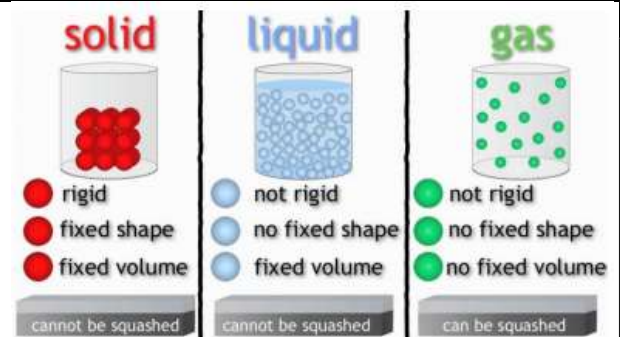


Key questions:

- How are the position and behaviour of the particles different in solids, liquids and gases? What makes materials change state? What are clouds made from?

Key knowledge:

- **Atoms** when put together, form **molecules**, which form **cells**, which form all matter on the planet e.g.
- Atoms and molecules don't change, but the way they move about does.
- Matter **changes state when more energy** gets added to it. Energy is often added in the form of **heat** or **pressure**.
- **Solid water** is called ice. This is water with the lowest energy and temperature. Water freezes at 0 degrees celcius.
- **Water boils at 100 degrees** – the added heat loosens the water molecules and results in **evaporation**- change of liquid into a gas.
- **Atoms** do not change but the way they move does.
- **Carbon dioxide** is a gas that is all around us- air is made up of a range of gases- Nitrogen, Oxygen, Carbon Dioxide and Argon are some.
- In 1767 Joseph Priestly invented fizzy drinks by putting **carbon dioxide into a drink**.



***Water freezes at 0 degrees Celcius** and ice starts to melt at the same temperature.

***Gas DOES have a weight.** Different gases have different weights.

*The freezing, boiling and melting temperatures of molecules other than water differ e.g Carbon Dioxide freezes at -78 degrees celcius
Water freezes at 0 degrees and boils (evaporates) at 100 degrees)

Key vocabulary:

Matter-Objects that take up space and have **mass** (weight) are called matter. Everything around you is made up of matter. The three states of matter: **gas, solid and liquid**. **Adding/reducing heat** may result in changes of state.

Solid- A solid holds its shape and has a **fixed volume**. **The bonds between atoms are rigid**.

Liquid-A liquid fills up the shape of the of a container. It forms a pool, not a pile and also has a fixed volume. The **atoms are loosely bonded** together which allows them to flow. **Its volume is fixed, but its shape is not**.

Gas- A gas can escape from an unsealed container. It fills up the space it is in, and **does not have a fixed volume nor does it have any bonds** between its atoms.

Evaporation-Changing from a **liquid to a gas** by adding heat e.g **drying up a puddle in the sunshine**= liquid water heated and turned into a gas (water vapour) This will result in the clouds – a collection of water vapour molecules.

Condensation- Changing from a **gas to a liquid** e.g when liquid in a cloud cools, it turns to rain.

Transpiration- plant absorbs water in its roots and then gives off water vapour through the **pores** (holes) in its leaves.

Warm, windy days are the most suitable for transpiration, just like drying your washing.

Molecules -The very **tiny particles** that make matter. Can only be seen under an **electron microscope**.

Reversible -Capable of being reversed so that the previous state is restored e.g ice melted to water.

Irreversible- Not able to be undone or altered – a chemical change has occurred e.g a burnt match.

Water cycle- The process by which **water circulates** between the earth's oceans, atmosphere and land, involving **precipitation, evaporation and condensation**.

Particle- **protons, electrons and neutrons** which make up an atom (**the basic building block of all matter**)

Molecules- made up of **two or more atoms**, held together by chemical bonds. Eg **water is H₂O (2 Hydrogen 1 Oxygen)**.

Output and Working like a scientist:

- compare and group materials together according to whether they are solids, liquids or gases by sorting and describing them.
- To investigate gases and their uses based on their different properties.
- To investigate how heating and cooling can change a materials state.
- To explore how water can change state to a solid, liquid or a gas.
- To investigate how water evaporates. To identify and describe the different stages of the water cycle

