Water is an example of a chemical compound - when two or more elements join together to form molecules.
Water is 2 Hydrogen (H) atoms + 1 Oxygen (O) atom = H_2O

Knowledge Organiser
Changes of Materials

A 'mixture' in a scientific sense, can always be broken down into its component parts.

ROCKET WORDS
Learn these words and their definitions.

Key Word	Definition
separate	To split or divide a substance into its distinct elements
solution	A mixture of two substances, the solute and the solvent
solute	A substance that is dissolved in liquid.
solvent	A substance that dissolves a solute, such as water.
irreversible	Impossible to change back to a previous condition or state.
compound	A substance formed when two or more chemical elements are bonded together.
physical change	A change in material in which no new substances are formed
chemical change	A change that results in the creation of few chemical substances.

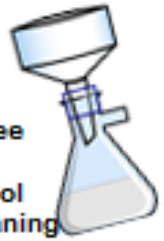
5 ways to compare a physical and chemical change.

Property	Physical Change	Chemical Change
Explanation	Molecules are rearranged but the actual type of molecules stay the same.	The type and make-up of the molecules is changed and a new substance is formed.
Change	A temporary change that is easily reversed, and no new substance is formed.	A permanent change that is irreversible, with a new substance always being formed.
Energy	No energy is produced, and very little or no energy is absorbed.	Energy is produced, in the form of light or heat (for example) and energy is also absorbed.
Effects	Only has an effect on physical properties of a substance or object i.e. shape, size.	Changes both physical and chemical properties of a substance or object.
Examples	Freezing or boiling water, melting wax	Burning wood, eating food, rusting of metal.

Lesson Sequence

1. Understand the actions of filtering, sieving and evaporating
2. Be able to explain the words dissolve and solution; know how to recover a substance from a solution
3. Understand that some changes to materials are not reversible
4. Understand that a chemical change alters a molecule permanently
5. Know that compounds are molecules
6. Know the difference between a chemical and physical change.

Filtering



- Brewing coffee
- Cleaning a swimming pool
- Vacuum Cleaning

Evaporating

- Body sweat
- The water cycle
- Salt / crystal extraction

Sieving

- Removing impurities during cooking
- Sieving sand during building
- Mining for minerals

Separation Techniques

Ways to test materials

Hardness
How resistant a material is to scratching and pressure.
Hard materials: hardwood, metal, plastics

Strength
The amount of force needed to break a material.
Strong materials: many metals and woods.

Elasticity
Ability of a material to turn to its original shape after the force is removed
Elastic materials: rubber bands, metal coil springs

Plasticity
Ability to retain the new shape when the force is removed.
Example materials: plasticine, clay.

Absorbency
Ability of a material to soak up liquid.
Absorbent materials: sponge, cotton wool, towel.

Waterproof
Resistant and repellent to a liquid
Waterproof materials: Many rubbers and plastics

Some insulating materials found in our houses include fibre glass loft insulation, cavity wall filler and double-glazed windows.

Natural resources which are used in every day life include: water, air, trees and plants, and cotton.

ROCKET WORDS

Learn these words and their definitions.

Key Word	Definition
comparative test	Undertaking a test with a controlled variable to help answer questions.
elasticity	The ability of a material to resume its normal shape after being stretched or compressed.
plasticity	The ability for a material to be easily shaped or moulded.
crude oil	A natural oil formed by carbon deposits and organic materials.
perforate	To pierce or puncture something.
extraction	To remove something from its natural setting.
thermal conductivity	The ability of a material or substance to conduct or transfer heat.
inexhaustible	Something unable to be used completely because there's too much of it to be all used up.