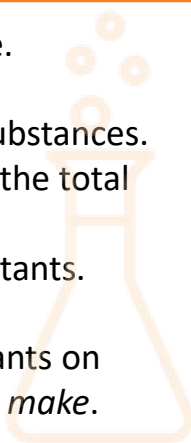


### Must Remember

- Physical changes are reversible. They include changes of state.
- Chemical reactions are not reversible.
- In a chemical reaction, atoms are re-arranged to make new substances.
- In a chemical reaction, the total mass of reactants is equal to the total mass of products. This is conservation of mass.
- In a chemical reaction, the starting substances are called reactants.
- The substances made in the reaction are called products.
- Word equations represent reactions simply. They show reactants on the left and products on the right. The arrow means *reacts to make*.



- Chemical reactions can make useful products and transfer energy.
- In oxidation reactions, substances join with oxygen to form oxides.
- Oxidation reactions include burning and rusting.
- Burning is also called combustion.
- In a thermal decomposition reaction, a compound breaks down when it is heated. The products are simpler compounds and elements.



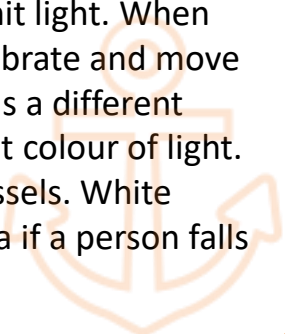
### Nice to know that...

- If a chemical reaction is happening, you might: see flames or sparks, notice a smell, hear fizzing or a bang, feel the temperature of the reaction mixture going up or down.
- Some reactions are very fast, but others are very slow, adding a catalyst can speed up a reaction.
- Different reactions require different catalysts, a catalyst isn't used up in the reaction but helps the reaction along.
- Combustion is a type of oxidation reaction where a fuel reacts (burns) with oxygen.
- Petrol, diesel, and coal are all fossil fuels, these take millions of years to form and produce harmful carbon dioxide when combusted.
- Fossil fuels cannot be replaced when used, and will eventually run out, so they are called non-renewable.
- Changes of state are not chemical reactions, but they are reversible this is called a physical change.



### Maritime Futures – Emergency Flares

Emergency flares contain chemicals that can be ignited to emit light. When heated the electrons that surround the nucleus of an atom vibrate and move energy level, this causes light to be emitted. Each element has a different number of electrons and so each element will emit a different colour of light. Emergency flares are used to attract attention from other vessels. White emergency flares are used to illuminate the surface of the sea if a person falls overboard during the night.



### Further Study

[BBC Bitesize – Types of reaction](#)

### Key Terms

- **Chemical Reaction:** A change in which atoms are rearranged to create new substances.
- **Combustion:** A chemical reaction in which a substance reacts quickly with oxygen and gives out light and heat.
- **Conservation of Mass:** In a chemical reaction, the total mass of reactants is equal to the total mass of products. This is conservation of mass. Mass is conserved in chemical reactions and in physical changes.
- **Decomposition:** A chemical reaction in which a compound breaks down to form simpler compounds and/or elements.
- **Physical Change:** A change that is reversible, in which new substances are not made. Examples of physical changes include changes of state, and dissolving.
- **Product:** A substance that is made in a chemical reaction.
- **Reactant:** A starting substance in a chemical reaction.
- **Word Equation:** A way of representing a chemical reaction simply. The reactants are on the lefts of an arrow, and the products are on the right. The arrow means reacts to make.