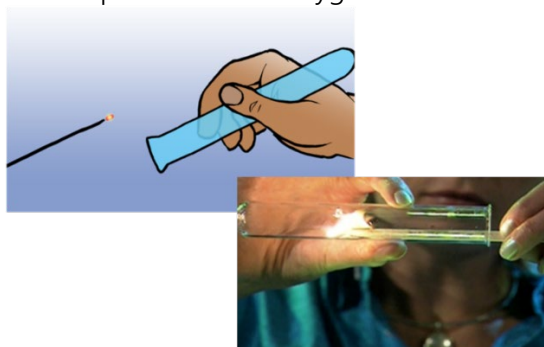




Gas Tests

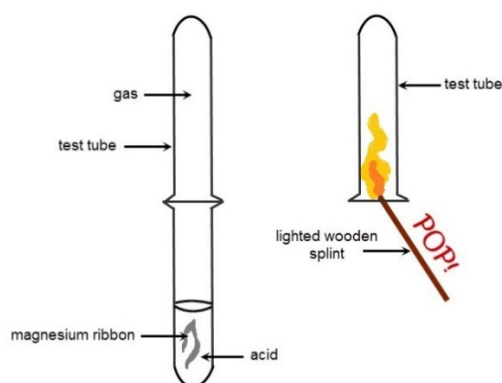
How to test for Oxygen Gas

1. Put a small amount of Manganese dioxide into a boiling tube and add hydrogen peroxide. **BE CAREFUL WITH THESE CHEMICALS and ALWAYS FOLLOW LAB SAFETY RULES**
2. Put a bung with a delivery tube over the boiling tube and put the delivery tube into an upside-down test tube to collect any gas.
3. Heat the tube gently with a Bunsen burner.
4. Remove delivery tube and place thumb over test tube.
5. Remove thumb quickly and place a glowing splint into the test tube.
6. If the splint re-ignites then it is likely the gas produced was oxygen.



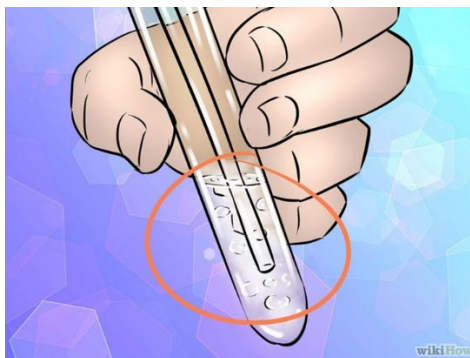
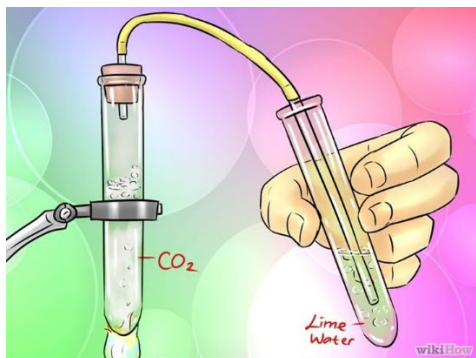
How to test for Hydrogen Gas

1. Put a small piece of magnesium metal into a test tube with a small amount of dilute hydrochloric acid.
2. Place another test tube upside down over top of the first test tube
3. Collect the gas in the upside down test-tube.
4. Place thumb over top of the test tube
5. Hold a lit match at the mouth of the test tube and remove thumb quickly
6. If the gas makes a loud 'pop' then it is likely that the gas produced is hydrogen.



How to test for Carbon Dioxide Gas

1. Put a small amount of calcium carbonate with dilute hydrochloric acid into a boiling tube.
2. Put a bung with a delivery tube over the boiling tube.
3. Place the delivery tube into a test-tube filled with clear limewater
4. Observe the gas bubbling into the limewater.
5. If the limewater turns cloudy then it is likely that the gas produced is carbon dioxide.

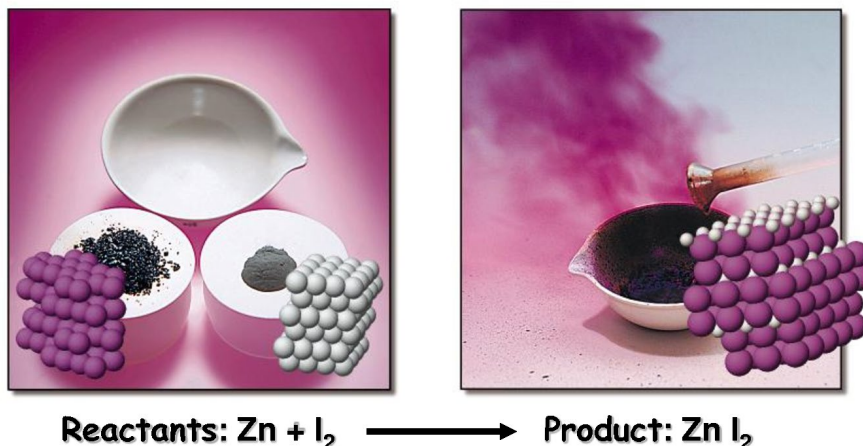


Carbon Dioxide is a colourless gas and limewater is a solution of calcium hydroxide in water, which is also colourless. The carbon dioxide gas reacts with the limewater and changes it into calcium carbonate which is not soluble (cannot dissolve) in water and appears as a milky white colour.

Chemical reactions - naming reactants & products

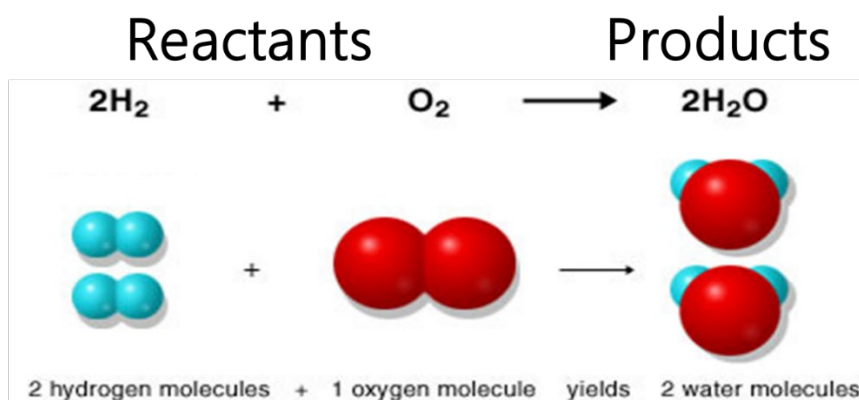
A **chemical reaction** is a process that produces a chemical change to one or more substances.

A chemical reaction will produce a **new substance**. Chemicals that are used in a chemical reaction are known as **reactants**. Those that are formed are known as **products**. Other observations of a chemical reaction may include a temperature change, a colour change or production of gas.



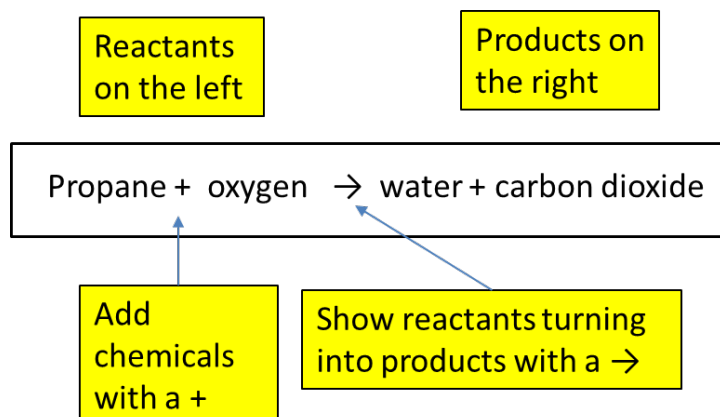
Reactants join together to form new products during chemical reactions

The atoms present in the **reactants** rearrange themselves in different combinations and form new bonds. The new combinations of atoms are called **products** and can either be single atoms or molecules.



Chemical reactions – word equations

The word equation therefore will be:



When we convert descriptions of reactions into word equations there is a set way of writing it. Once we have a word equation, we can write a formula equation.

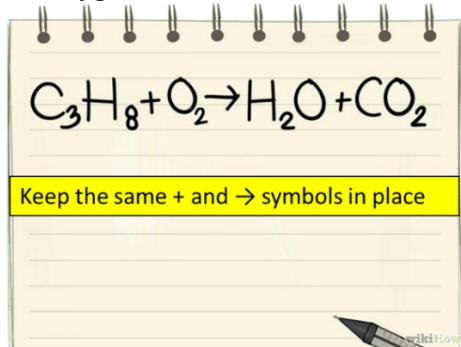
For example: When we use a BBQ, we cook with propane gas (C_3H_8) which needs oxygen gas in the air (O_2) to combust (or burn). The burning process creates water (H_2O) and carbon dioxide gas (CO_2)

Writing and Balancing symbol equations (Extension)

In a chemical equation the **total number of atoms in the reactants must equal the total number of atoms in the products** as no atoms are created or destroyed just rearranged with new bonds formed or bonds broken

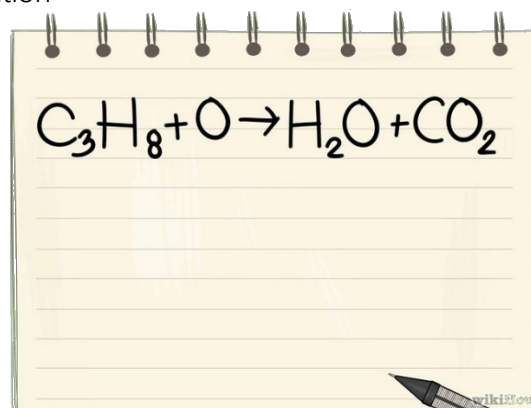
1. The word equation is:

Propane + oxygen → water + carbon dioxide



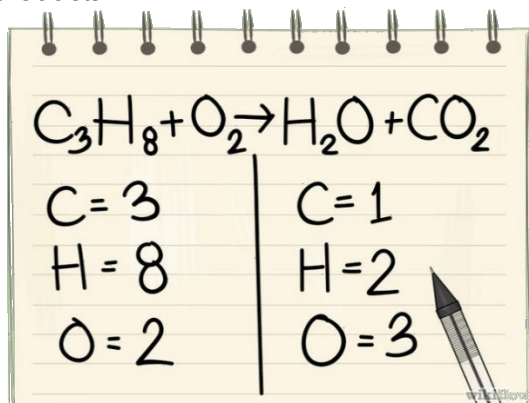
Once you can write word equations practice by writing the formula underneath

2. To balance an equation first write down the equation

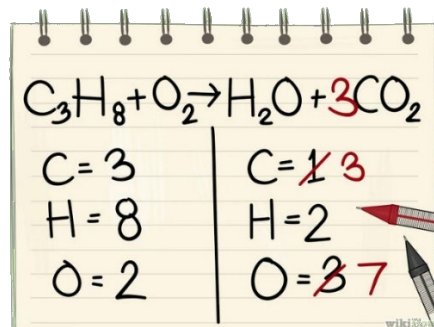


The total number of each type of atom must be the same for reactants and products if the equation is balanced

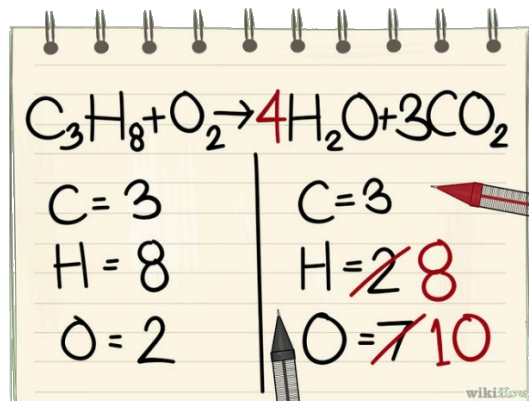
3. Count the total number of each atom for reactants and products



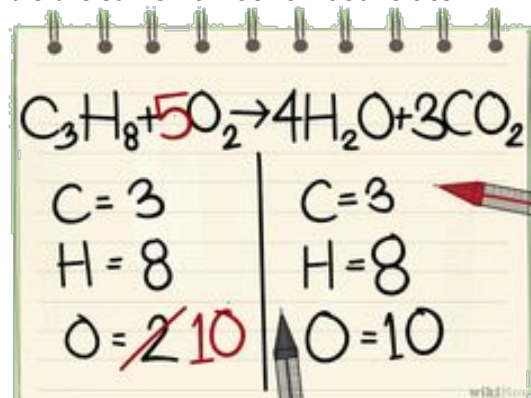
4. Starting with the first atom (C) **multiply until it is the same on both sides** – and place this number in front of the compound. You may change the number of another atom, but you can sort this as you move down the list



5. Moving down the list to the next atom (H) multiply until both sides are the same – again you may also increase another atom but sort that out after






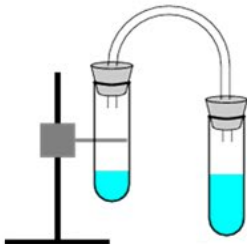
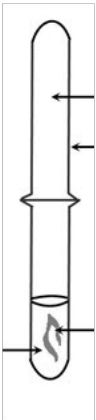
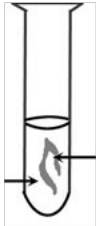
6. Moving to the last atom on this list (O) multiply until it is the same number on both sides



If all atoms are the same number on both sides, then the equation is **balanced**!



1. Complete the chart to describe a positive test for each gas. Label diagrams and draw steps for each test.
Write explanation under each

 <p>Plant stomata which allows CO₂ gas into the leaf</p>	 <p>Rocket fueled by liquid hydrogen</p>	 <p>Oxygen in the air combines with iron to form rust.</p>
carbon dioxide (CO ₂)	hydrogen (H ₂)	oxygen (O ₂)
Step ONE: 	Step ONE: 	Step ONE: 
Step TWO:	Step TWO:	Step TWO:

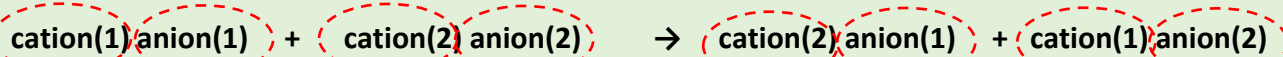
2. Looking at the pancake recipe below, write the cooking process as a **word equation**



For example: making pancakes is a chemical change.
The reactants (ingredients you start with) are flour, milk, egg and sugar.
The product is pancakes.

3. Below are different types of reactions. Write the **word equation** for each, then the **formula** for each substance. **EXTENSION:** balance the symbol equations for the following reactions

Precipitate Reactions:

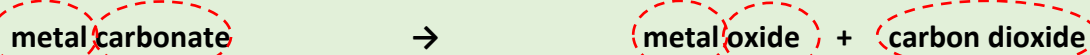


1. silver nitrate is mixed with sodium chloride to produce sodium nitrate and silver chloride.

Word equation _____

Symbol equation _____

Decomposition Reactions:

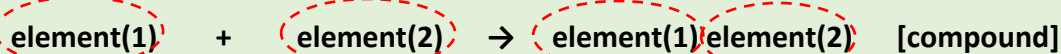


2. sodium carbonate powder is heated to produce sodium oxide and carbon dioxide gas

Word equation _____

Symbol equation _____

Combination Reactions:



3. iron metal is heated with sulfur to produce iron sulfide

Word equation _____

Symbol equation _____