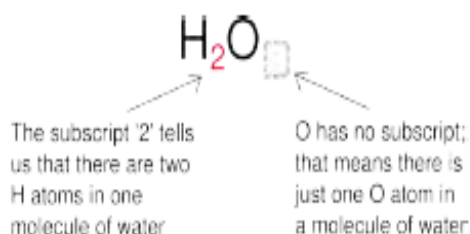
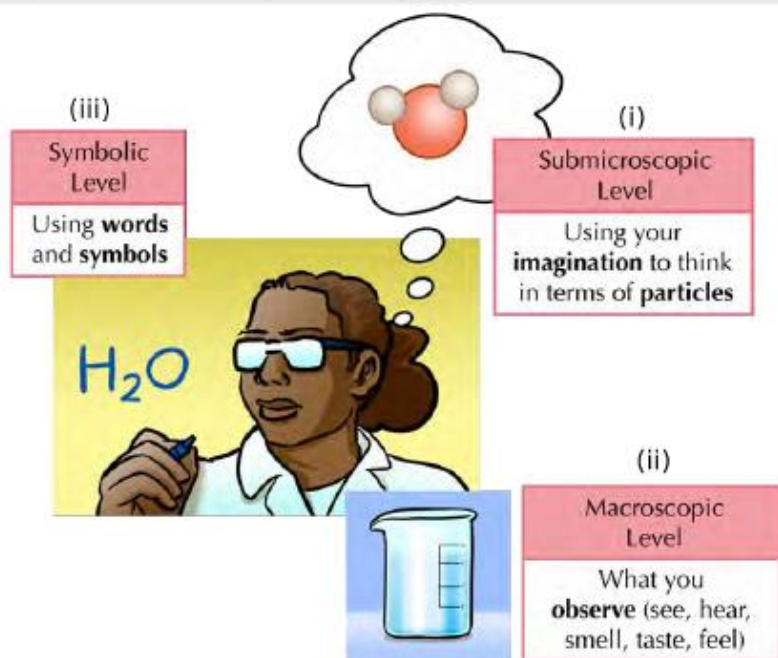


Gr 9 NS

Molecules and Revision

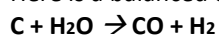


Here are a few important rules for balancing chemical equations:

- When we balance reaction equations we may **ONLY** add coefficients to the chemical formulae that are already in the equation.
- We may **NOT** change the chemical formulae of any of the reactants or products by changing the subscripts in a formula.
- We may **NOT** add other reactants or products. This includes adding single atoms of any of the elements already in the reaction equation.
- We may **NOT** remove reactants or products.

Excercise

Here is a balanced chemical equation:



Answer the four questions below that relate to this equation: [8 marks]

- Write the formulae of the reactants of this reaction.
- Write the names of the reactants of this reaction.
- Write the formulae of the products of this reaction.

d) Write the names of the products of this reaction.

Answers

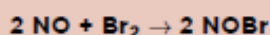
a) C and H₂O.

b) carbon and water

c) CO and H₂

d) carbon monoxide and hydrogen

Exercise



Complete the table by counting how much of each atom is on each side of the reaction equation. [6 marks]

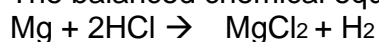
NOTE: Learners do not need to know this equation, it is just to practice balancing equations.

Number of atoms	In the reactants	In the product
Nitrogen (N)	2	2
Oxygen (O)	2	2
Bromine (Br)	2	2

Formulating an Hypothesis and experiment.

A piece of magnesium ribbon was placed into a flask which contained hydrochloric acid (HCl). The contents of the flask became warm and the gas was released.

The balanced chemical equation for the reaction is as follows:



What do you predict: Asaf and Sonke investigated how the length of the magnesium ribbon would affect the amount of hydrogen gas produced. They thought that a longer piece would release more hydrogen gas. They carried out an experiment to find this out.

HYPOTHESIS:

IDENTIFY VARIABLES:

1. Which variables must be kept constant to make this a fair test?

2. What is the independent variable? (what is it that you have control over to change in this investigation?)

3. What are the dependent variables? (Which variables will you be measuring?)

4. How would determine the density of the materials? (Own words)

Exercise

1. Fill in the missing words in these sentences. Write the word on the line below. [3 marks]
 - a) When an acid reacts with a metal, a salt and _____ gas forms.
 - b) A molecule that consists of two atoms bonded together is called a _____ molecule.
 - c) The scientific quantity represented by the mass of a substance in a given volume is called the _____ of that substance.
 - a) *hydrogen*
 - b) *diatomic*
 - c) *density*
2. Write a short paragraph (2 sentences or more) to explain why a balloon filled with hydrogen will float upwards. [2 marks]

Learner's paragraph should contain at least the following:

 - *Hydrogen gas is less dense than air.*
 - *Substances of lesser density always float on substances of greater density.*
3. Imagine you are carrying out a reaction and you expect one of the products that will form is hydrogen. Write a short paragraph (2 sentences or more) to describe how you would confirm the presence of hydrogen gas. [2 marks]

Learner's paragraph should contain at least the following:

 - *The first sign to look out for is bubbles. The presence of bubbles signals that a gas is formed during the reaction.*
 - *To confirm whether the gas is hydrogen, collect a small amount in a test tube. Hold a glowing splint at the opening of the test tube when you release the gas. If the gas ignites with a characteristic 'pop' sound, we will know it is hydrogen.*