Section A:

1. State the definition of relative formula mass.

   _____

   _____

2. Which of these statements is correct?

   Tick one box.
   One mole of a substance contains 6.02 x10^{23} particles

   One mole of a substance always has the same mass

   One mole of a substance will have the as many
   particles as its mass in grams

3. What are the correct units for amount of substance?
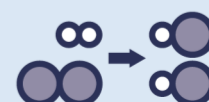
   Tick one box.
   mol

   g

   g/mol

4. In the box below, write the equation that links number of moles, mass and relative
   formula mass.

Section B

Answer the following questions, showing all working:

5. Here is the equation for fermentation.

$$C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$$
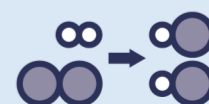
Glucose → Ethanol + Carbon dioxide

In an experiment 60 g of glucose were fermented.
(Ar: C = 12, H = 1, O = 16)

a. Describe the equation in words, include the word 'mole' in your answer.

_____

_____

_____

b. Calculate the relative formula mass of glucose ($C_6H_{12}O_6$).

_____

_____

_____

c. Calculate the amount of substance in 60g of glucose.

_____

_____

_____

_____

Science **Mastery**

6. Calculate the **amount of substance** in the following.
   (Ar: Ca = 40; Si = 28; Ag = 108; Cl = 35.5; K = 39; H = 1; O = 16; Li = 7)

   a. 40 g of Ca

   b. 14 g of Si

   c. 216 g Ag

   d. 35.5 g of Cl_2

   e. 14 g of KOH

   f. 12 g of LiH

7. Calculate the **mass** of the following.
   (Ar: Mg = 24; Cl = 35.5; Fe = 56; Co = 59; O = 16; H = 1)
   a. 0.5 moles of Mg

   b. 4 moles of Cl_2

   c. 2 moles of Fe

   d. 1 mole of $CoCl_2$

   e. 0.5 moles of O_2

   f. 0.5 moles $Mg(OH)_2$

Section C
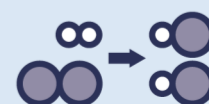
8. A scientist is looking at the chemical reaction between magnesium and oxygen.

   a. State the word equation for the reaction that would occur between magnesium and oxygen.
   b. Draw the electronic configuration of an oxygen atom.
   c. State the type of bond that would be formed in this reaction. Explain your answer.
   d. Describe what happens to the atoms when magnesium and oxygen bond. You may wish to use a diagram.
   e. The scientist has 48 g of magnesium. Calculate the amount of substance they have.
   f. The scientist has 3 moles of oxygen. Calculate the mass of oxygen they have.