Science
Mastery

Section A:

1. Match the quantities below with their correct units.

Mass	
Number of moles	
Volume	
Concentration	

mol	
g/dm^3 or mol/dm^3	
g	
dm^3	

2. What is the correct relative formula mass for calcium hydroxide ($Ca(OH)_2$)?
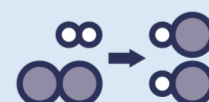
   Tick one box.
   58

   74

   114

3. In the box below, write the equation that links concentration, mass and volume.

4. In the box below, write the equation that links concentration, number of moles and volume.

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

Section B

Use a periodic table and show all working for the following questions:

6. 0.20 moles of NaOH is dissolved in 250 cm³ of water.
   a. Calculate the concentration in mol/dm³.

_____
_____
_____

   b. Calculate the concentration in g/dm³.

_____
_____
_____

7. 5.0 g of KNO₃ is dissolved in 100 cm³ of water.
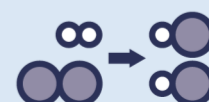   a. Calculate the concentration in g/dm³.

_____
_____
_____

   b. Calculate the concentration in mol/dm³ .

_____
_____
_____

8. Calculate the concentration of the following solutions in **g/dm³** .
   a. 0.100 mol/dm³ NaOH.

_____
_____
_____
_____
_____

   b. 0.250 mol/dm³ CH₃COOH

_____
_____
_____
_____
_____

   c. 1.50 mol/dm³ HNO₃

_____
_____
_____
_____
_____

9. The concentration of ethanoic acid (CH_3COOH) in a bottle of vinegar is 0.85 mol/dm³.
   Calculate the mass of ethanoic acid that would be in 200 cm³ of this vinegar.

_____
_____
_____
_____
_____
_____

10. A scientist has a bottle of 2 mol/dm³ copper sulfate solution.
    a. Describe and explain how they could increase the concentration of the solution.

_____
_____
_____
_____

    b. Describe and explain how they could decrease the concentration of the solution.

_____
_____
_____
_____

Section C

11. Normal blood glucose concentration is below 140 mg/dm³. Glucose has the formula $C_6H_{12}O_6$.
    a. Calculate normal blood concentration in mmol/dm³.
    b. Glucose is transported around the body in blood. Describe the different components of blood and their functions.
    c. Explain the importance of glucose for cells.
    d. State the word equation for aerobic respiration.
    e. Explain the difference between aerobic and anaerobic respiration.
    f. Describe and explain the changes that occur to the body during exercise.