



Answer all the questions below.

Fill in the Gap:

1. The relative atomic mass of carbon is \_\_\_\_\_.
2. Define relative atomic mass.
  - a. The relative formula mass of water ( $H_2O$ ) is \_\_\_\_\_.
  - b. Calculate the relative formula mass of carbon dioxide ( $CO_2$ ). (Relative atomic masses:  $C = 12$ ,  $O = 16$ )
3. Match the Compound to its Relative Formula Mass:

Compound	Relative formula mass	Mass of 1 mole in grams
$H_2O$		
$CO_2$		
$CaCO_3$		
$NaCl$		

4. Fill in the gaps to complete the sentences below:
  - a. The relative formula mass of sodium carbonate ( $Na_2CO_3$ ) is \_\_\_\_\_.  
(Relative atomic masses:  $Na = 23$ ,  $C = 12$ ,  $O = 16$ )

Fill in the Gap:

- b. One mole of any substance contains \_\_\_\_\_ particles. This number of particles is called \_\_\_\_\_ number
5. Calculate the relative formula mass of ammonium sulfate  $((\text{NH}_4)_2\text{SO}_4)$ .  
(Relative atomic masses: N = 14, H = 1, S = 32, O = 16)
6. How many molecules are there in 2 moles of water?
7. Calculate the mass of 2 moles of sodium chloride (NaCl). (Relative atomic masses: Na = 23, Cl = 35.5)
8. Calculate the relative formula mass of calcium carbonate  $(\text{CaCO}_3)$  and also the mass of 1 mole of calcium carbonate. (Relative atomic masses: Ca = 40, C = 12, O = 16)

## Answers

1. The relative atomic mass of carbon is \_\_\_\_\_.

Answer: 12

2. Define relative atomic mass.

Answer: Relative atomic mass is the weighted average mass of an atom of an element compared to 1/12th the mass of a carbon-12 atom.

b. The relative formula mass of water ( $H_2O$ ) is \_\_\_\_\_.

Answer: 18

c. Calculate the relative formula mass of carbon dioxide ( $CO_2$ ). (Relative atomic masses: C = 12, O = 16)

Answer: Relative formula mass of  $CO_2 = 12 + 32 = 44$

3. Match the Compound to its Relative Formula Mass:

Compound	Relative formula mass	Mass of 1 mole in grams
$H_2O$	18	18
$CO_2$	44	44
$CaCO_3$	100	100
$NaCl$	58.5	58.5

4. Fill in the gaps to complete the sentences below:

a. The relative formula mass of sodium carbonate ( $Na_2CO_3$ ) is \_\_\_\_\_.  
(Relative atomic masses: Na = 23, C = 12, O = 16)

Answer= 106 ( 23 x2) + (12 + 16x3)

Fill in the Gap:

- b. One mole of any substance contains \_\_\_\_\_ particles. This number of particles is called \_\_\_\_\_ number

Answer:  $6 \times 10^{23}$ , Avogadro's

5. Calculate the relative formula mass of ammonium sulfate  $((\text{NH}_4)_2\text{SO}_4)$ .  
(Relative atomic masses: N = 14, H = 1, S = 32, O = 16)

Answer:

$$\text{Relative formula mass of } (\text{NH}_4)_2\text{SO}_4 = 2(14 + 4) + 32 + 4(16)$$

$$= 2(18) + 32 + 64$$

$$= 36 + 32 + 64$$

$$= 132$$

6. How many molecules are there in 2 moles of water?

Answer: There are  $2 \times 6.02 \times 10^{23} = 1.204 \times 10^{24}$  molecules of water.

7. Calculate the mass of 2 moles of sodium chloride (NaCl). (Relative atomic masses: Na = 23, Cl = 35.5)

Answer:

$$\text{Relative formula mass of NaCl} = 23 + 35.5 = 58.5$$

$$\text{Mass of 1 mole of NaCl} = 58.5 \text{ g}$$

$$\text{Mass of 2 moles of NaCl} = 2 \text{ times } 58.5 = 117 \text{ g}$$

8. Calculate the relative formula mass of calcium carbonate ( $\text{CaCO}_3$ ) and also the mass of 1 mole of calcium carbonate. (Relative atomic masses:  $\text{Ca} = 40$ ,  $\text{C} = 12$ ,  $\text{O} = 16$ )

Answer:

Relative formula mass of  $\text{CaCO}_3 = 40 + 12 + (3 \text{ times } 16) = 100$

Mass of 1 mole = 100g