LESSON MAKER PRO

Formula Mass Detectives

Use the atomic-mass table to find each formula mass in u.

HIGH SCHOOL · PHS.3

PHS.3 "Students will analyze the organization of the periodic table of elements to predict atomic interactions. Use contextual evidence to determine the organization of the periodic table, including metals, metalloids, and nonmetals; symbols..."

NAME _____ DATE _____

COUNT, MULTIPLY, ADD

A subscript tells you how many atoms of an element are in a formula. If there is no subscript, count one atom. Multiply each element's atomic mass by its number of atoms, then add the results to find the formula mass in atomic mass units (u).

WORKED EXAMPLE

What is the formula mass of LiF? Use this atomic-mass table for the whole worksheet.

ATOMIC MASSES

Element	Mass (u)	Element	Mass (u)
Li	7	F	19
C	12	O	16
Mg	24	Na	23
Cl	35.5	H	1
Ca	40	Si	28
Fe	56	S	32

1. LiF has one Li atom and one F atom.
2. Li contributes 1 × 7 u = 7 u.
3. F contributes 1 × 19 u = 19 u.
4. Add: 7 u + 19 u = 26 u.

Answer: 26 u

PRACTICE 6 problems

1 Find the formula mass of CO.

ANSWER _____

2 Find the formula mass of CO_2.

ANSWER _____

3 Find the formula mass of MgO.

ANSWER _____

4 Find the formula mass of NaCl.

ANSWER _____

5 Find the formula mass of H_2S.

ANSWER _____

6 Find the formula mass of Fe_2O_3.

ANSWER _____

APPLY IT Show your work

1 A phone screen contains silicon dioxide, SiO_2. What is the formula mass of SiO_2?

WORK SPACE

ANSWER _____

2 After a snow day, a crew spreads calcium chloride, $CaCl_2$, on an icy sidewalk. What is its formula mass?

WORK SPACE

ANSWER _____

CHALLENGE One step up

An air-quality sensor detects sulfur dioxide, SO_2, and carbon dioxide, CO_2. Which molecule has the greater formula mass, and by how many u? Show both calculations.

WORK SPACE AND ANSWER

ANSWER KEY

Formula Mass Detectives

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the formula mass of CO.	**28 u**
2	Find the formula mass of CO_2.	**44 u**
3	Find the formula mass of MgO.	**40 u**
4	Find the formula mass of NaCl.	**58.5 u**
5	Find the formula mass of H_2S.	**34 u**
6	Find the formula mass of Fe_2O_3.	**160 u**

PART 2 · APPLY IT

1. **60 u** Add the mass of one Si atom and two O atoms: 28 u + 2 × 16 u = 60 u.
2. **111 u** Add the mass of one Ca atom and two Cl atoms: 40 u + 2 × 35.5 u = 111 u.

CHALLENGE

SO_2: 32 + 2 × 16 = 64 u. CO_2: 12 + 2 × 16 = 44 u. SO_2 is greater by 20 u.

Accept calculations with the correct atom counts and units. For the challenge, both formulas have two oxygen atoms, so the 20 u difference comes from sulfur and carbon.