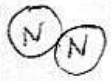
ANSWERS

Molecular Mass

Name

Period

1. For water…		
How would you draw one molecule?	According to the periodic table, what is the mass of a mole of this molecule?	Find the mass of 4.05 moles of this molecule.
	(H) $2 \times 1.01 = 2.02$ g/mole (O) $1 \times 16.00 = 16.00$ g/mole 18.02 g/mole	$4.05 \text{ moles} \times \left(\frac{18.02 \text{ grams}}{1 \text{ mole}}\right) =$ Answer: 72.98 grams

2. For nitrogen…		
How would you draw one molecule?	According to the periodic table, what is the mass of a mole of this molecule?	Find the mass of 1,003,000 molecules of this substance.
	N 2 atoms 2×14.01 g/mol $= 28.02$ grams/mole	$1{,}003{,}000 \text{ molecules } N_2 \times \left(\frac{28.02 \text{ grams}}{6.02 \times 10^{23} \text{ molecules } N_2}\right) = 4.67 \times 10^{-17}$ grams

3. For bromine…		
How would you draw one molecule?	According to the periodic table, what is the mass of a mole of this ~~molecule~~?	Find the mass of 56.9 moles of this molecule.
	$2 \times 79.904 = 159.808$ g/mol	$56.9 \text{ moles} \times \left(\frac{159.808 \text{ g}}{1 \text{ mole}}\right) = 9090$ grams

4. What would be the mass of 3.08×10^{13} atoms of nickel?

$$3.08 \times 10^{13} \text{ atoms} \times \frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ atoms}} \times \frac{58.6934 \text{ grams}}{1 \text{ mole}} = 3.00 \times 10^{-9} \text{ grams}$$

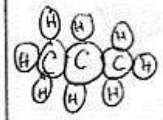
5. For CO_2…

How would you draw one molecule?	According to the periodic table, what is the mass of a mole of this molecule?	Find the mass of 2.94×10^{17} molecules of this substance.
	oxygen: $2 \times 16.00 = 32.00$ g/mole carbon: $1 \times 12.01 = 12.01$ g/mole 44.01 g/mole	2.94×10^{17} molecules $\times \left(\frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ molecules}}\right) \times \left(\frac{44.01 \text{ grams}}{1 \text{ mole } CO_2}\right)$ ANSWER = 2.15×10^{-5} grams

6. For laughing gas, N_2O…

How would you draw one molecule?	According to the periodic table, what is the mass of a mole of this molecule?	Find the mass of 4.66×10^{-2} moles of this molecule.
	N: $2 \times 14.01 = 28.02$ g/mole O: $1 \times 16.00 = 16.00$ g/mole 44.02 g/mole	4.66×10^{-2} moles $\times \left(\frac{44.02 \text{ grams}}{1 \text{ mole}}\right) = 2.05$

7. For the substance propane, C_3H_8 …

How would you draw one molecule?	According to the periodic table, what is the mass of a mole of this molecule?	Find the mass of 1.944×10^{25} molecules of this substance.
 YOU CAN DRAW IT ANY ORDER…	C: $3 \times 12.01 = 36.03$ g/mole H: $8 \times 1.01 = 8.08$ g/mole 44.11 g/mole	1.944×10^{25} molecules $\times \left(\frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ molecules}}\right) \times \left(\frac{44.11 \text{ grams}}{1 \text{ moles}}\right) =$ ANSWER: 1420 grams

8. For ammonia, NH_3…

How would you draw one molecule?	According to the periodic table, what is the mass of a mole of this molecule?	Find the mass of 0.0550 moles of this molecule.
	H: $3 \times 1.01 = 3.03$ g/mol N: $1 \times 14.01 = 14.01$ g/mol 17.04 g/mol	0.0550 mole $\times \left(\frac{17.04 \text{ grams}}{1 \text{ moles}}\right) = 0.937$ grams

9. What would be the mass of 3.00 moles of sodium?

$3.00 \text{ moles Na} \times \left(\frac{23.00 \text{ grams Na}}{1 \text{ moles Na}}\right) = 69.0 \text{ grams}$