

## Activity 7: Moles and Avogadro's Number

### *Learning Objectives*

*Conceptualize the mole unit*

*Convert between the units mole, particle (atom or molecule), and gram*

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**Estimated Completion Time**      45 Minutes

### **Instructor Information**

This activity assumes that students understand scientific notation.

### **ANSWERS TO QUESTIONS**

1. 50 g
2. .3 kg or 300 g
3.  $2 \times 10^{-23}$  g
4. a. Students should recognize that the atomic mass of carbon is 12.01.  
b. 16.00  
c. 32.07
5. The weight is the sum of the atomic masses for the atoms.
6. a. 12      b. 24      c. 500      d.  $6.20 \times 10^{23}$
7. a.  $6.20 \times 10^{23}$  atoms      b.  $6.20 \times 10^{23}$  molecules      c.  $6.20 \times 10^{23}$  atoms
8. Items per mole or particles per mole
9.  $1.81 \times 10^{24}$  atoms

10.  $1.81 \times 10^{24}$  atoms

11. 36.0 g

12. 106 g

13. 54.1 g

14. 48.1 g

15. The mole is a counting unit for molecules. It relates the number of particles to the mass of the atoms.

### **Activity 7: Skill Development**

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1. a.  $3.31 \times 10^{23}$  atoms      b. 1.04 moles      c.  $1.92 \times 10^{23}$   $\text{CaCO}_3$

2. a.  $7.95 \times 10^{23}$  atoms      b. .232 moles      c.  $5.5 \times 10^{23}$  NaCl

3.  $1.2 \times 10^{23}$  atoms of Au