

Introduction: A mole is defined as the mass, in grams, equal to the atomic mass of an atom or molecular mass of a molecule. A mole of any substance contains the same number of particles,  $6.022 \times 10^{23}$ , known as Avogadro's number. Given those two pieces of information, you should be able to determine the number of particles in a sample of a substance.

Procedure:

1. Predict which of the samples at each station will have the most particles. Record your prediction.
2. Find the mass of each sample and record it on the chart below.
3. Determine the molar mass of each substance.
4. Calculate the number of moles in each sample, using dimensional analysis or the formula:

$$\text{Mole} = \text{mass(g)} / \text{molar mass.}$$

5. Determine the number of particles in each sample, using dimensional analysis or the formula:

$$\text{Mole} = \# \text{ particles} / \text{Avogadro's number}$$

Data and Results:

1. Circle the sample that you believe has the most particles in each of the following pairs:



2. Calculate the molar mass of each substance. SHOW YOUR WORK.

3. Calculate the number of moles of each substance. **SHOW YOUR WORK.**

4. Calculate the number of particles of each substance. **SHOW YOUR WORK.**

Sample	Mass	Molar mass	Moles	Particles
Copper				
Ethanol				
Zinc				
Water				
Sulfur				
Glycerin				

Analysis: Where your hypotheses correct? Explain.