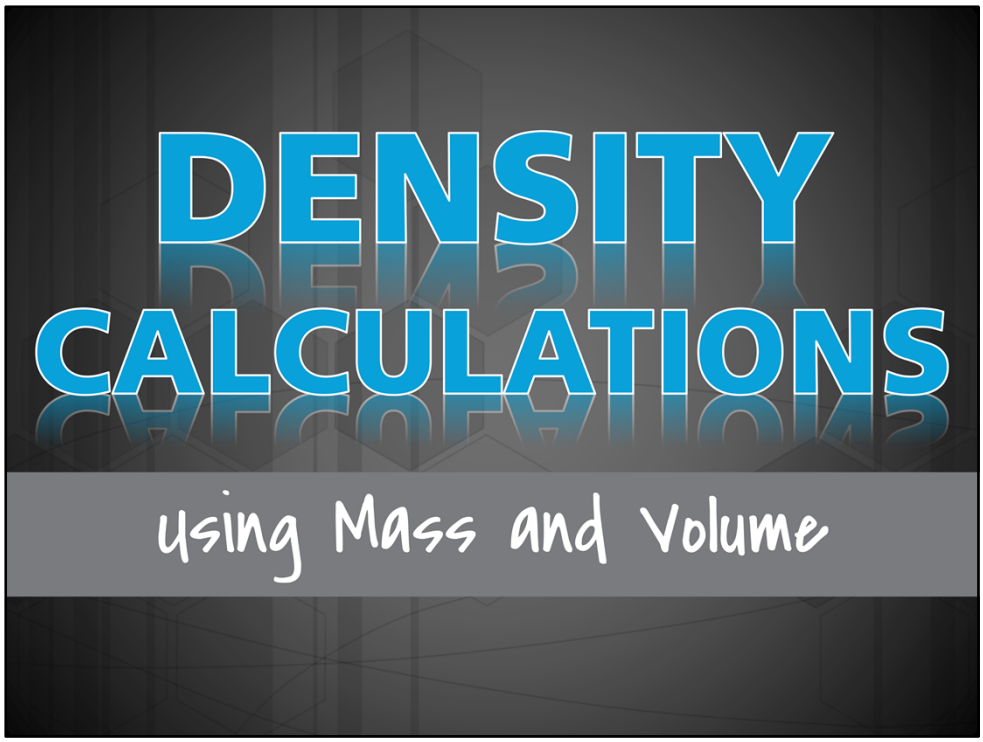
Module 1: What is Chemistry?
Topic 3 Content: Density Calculations Using Mass and Volume

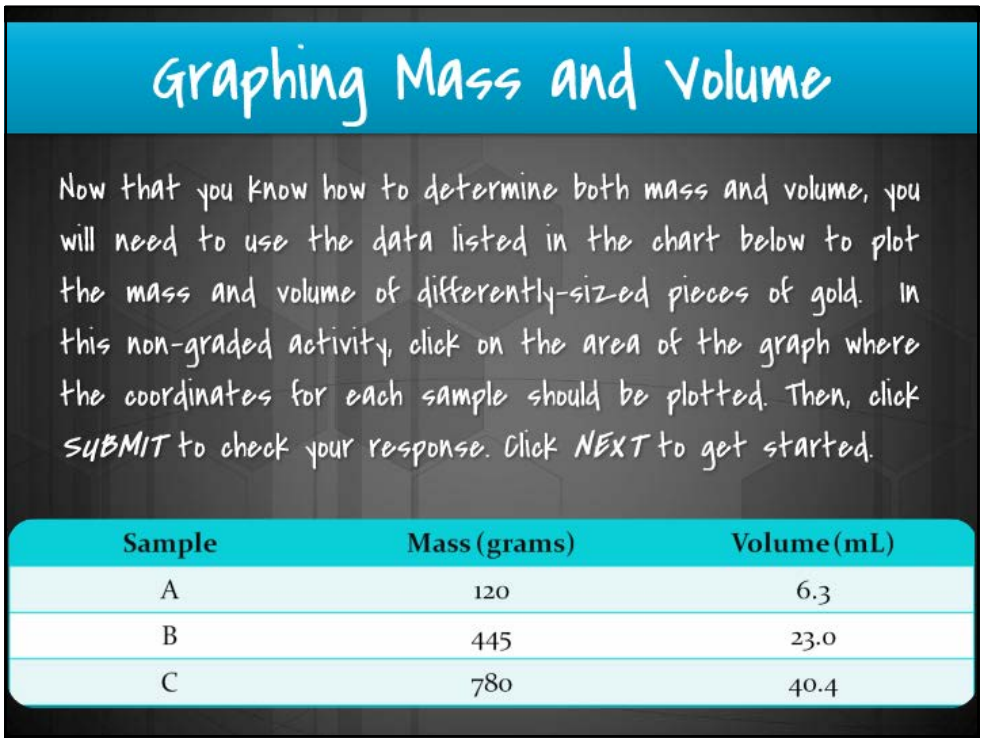


Density Calculations Using Mass and Volume

Module 1: What is Chemistry?
Topic 3 Content: Density Calculations Using Mass and Volume

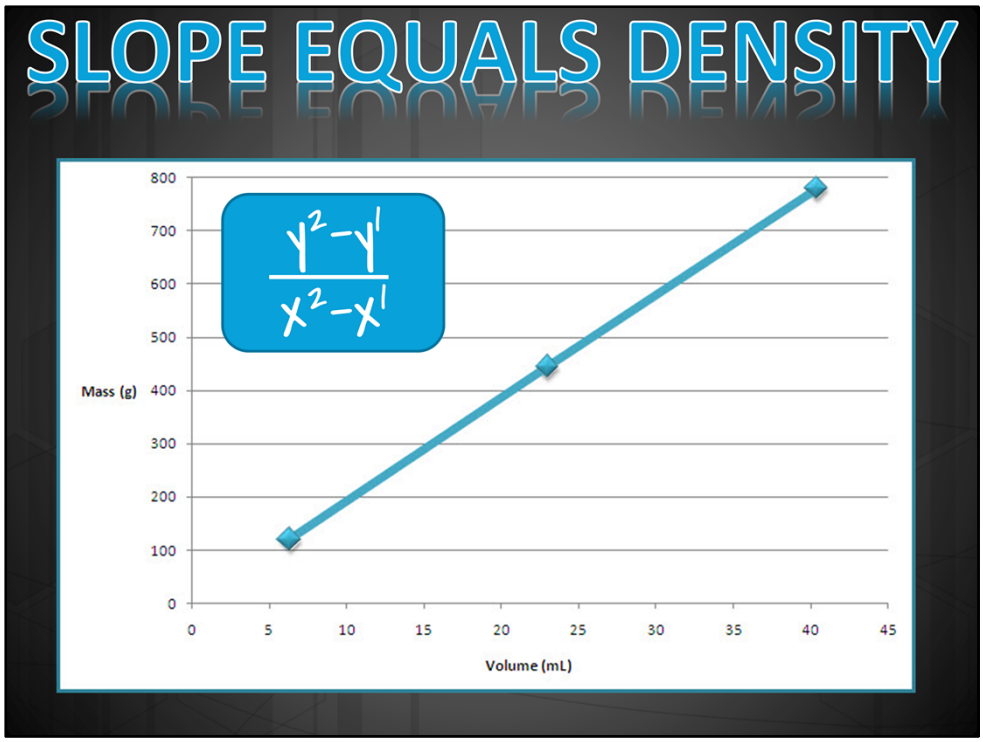
Consider how a piece of cork and a piece of lead of equal sizes would feel when held right after the other. The difference in the way they feel is due to the difference in their densities. Density is a physical property of matter that refers to how closely "packed" the material seems to be by comparing its mass to its volume. The density of a substance can be used to determine its identity. You can mathematically determine an object's density, indicated by the Greek letter rho, by dividing the object's mass by its volume.

Module 1: What is Chemistry?
Topic 3 Content: Density Calculations Using Mass and Volume



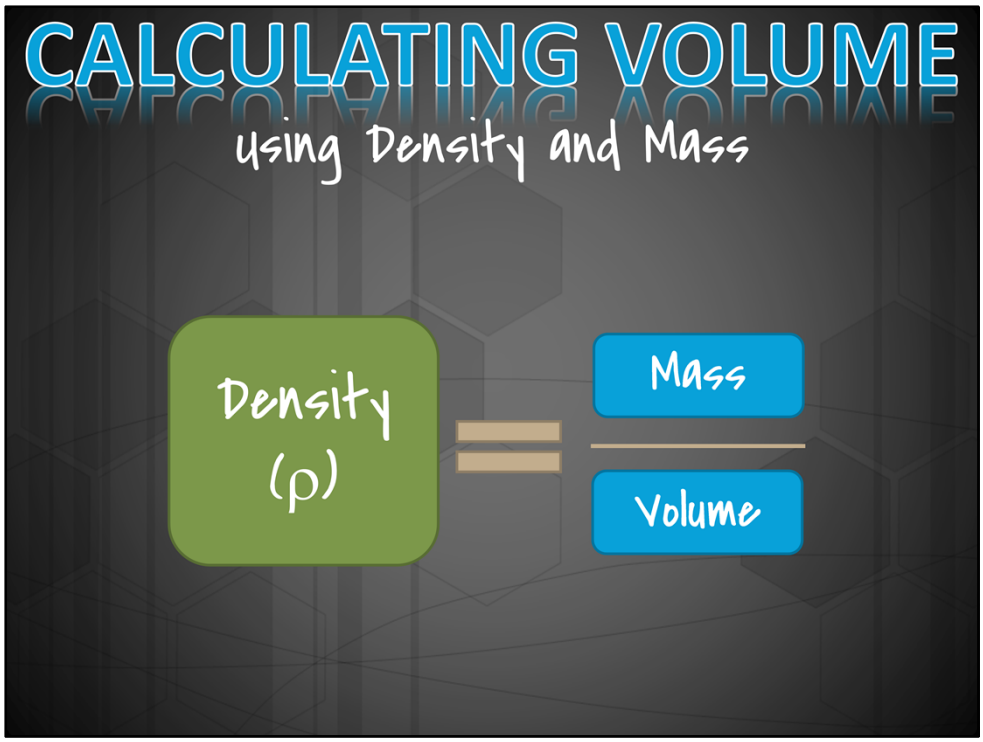
Now that you know how to determine both mass and volume, you will need to use the data listed in this chart to plot the mass and volume of differently-sized pieces of gold. In this non-graded activity, click on the area of the graph where the coordinates for each sample should be plotted. Then, click ***SUBMIT*** to check your response. Click ***NEXT*** to get started.

Module 1: What is Chemistry?
Topic 3 Content: Density Calculations Using Mass and Volume



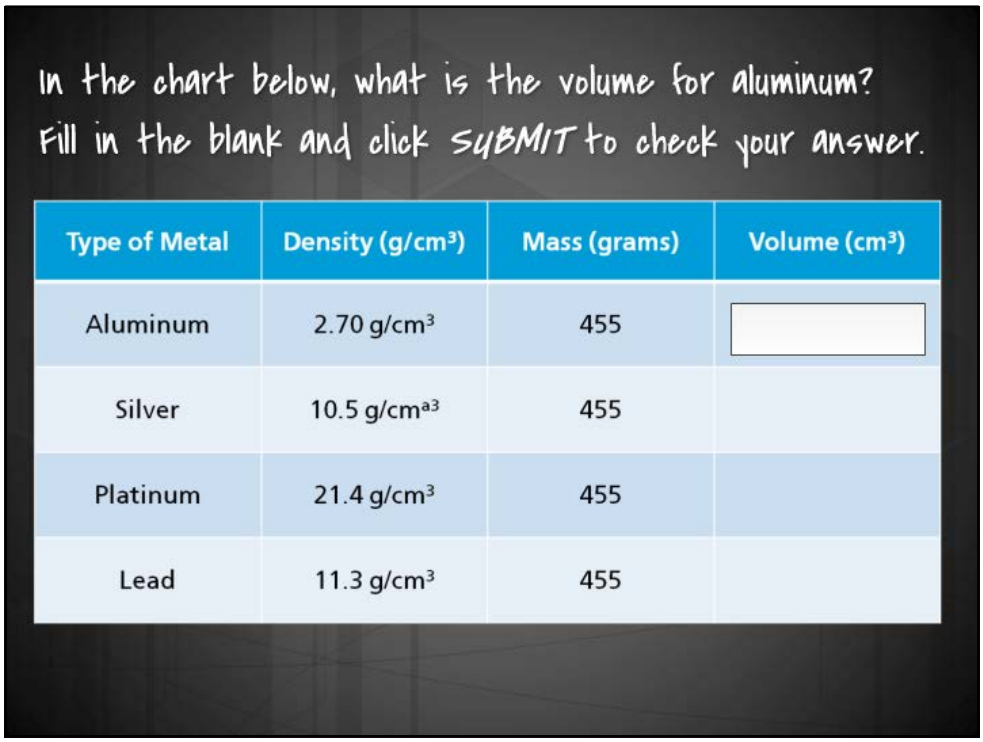
From your algebra classes, you know that the slope of a line can be determined by dividing the difference of two "y" points by the difference of two "x" points. Since the y-axis of this graph represents mass and the x-axis of the graph represents volume, you can see graphically that an object's mass divided by its volume equal its density. The slope of the line in the graph that you created represents the density of gold. You can use any of these coordinates to calculate the density because the slope of the line is consistent. As the volume of gold increases, so does its mass.

Module 1: What is Chemistry?
Topic 3 Content: Density Calculations Using Mass and Volume



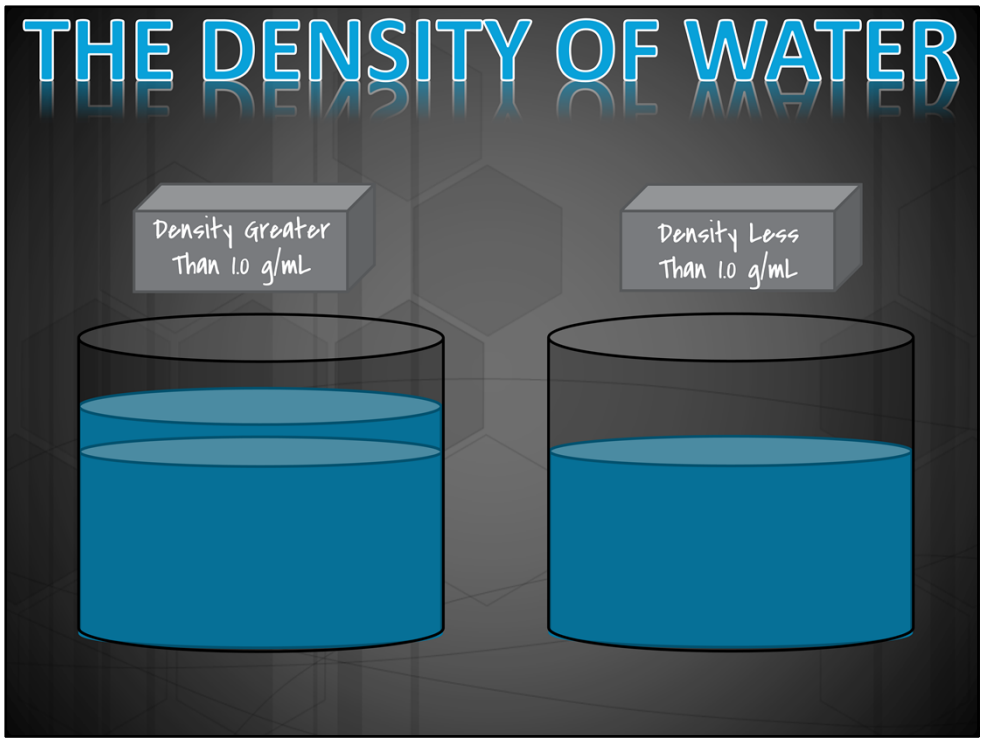
Since you know that density equals mass divided by volume, and mass and volume have a direct relationship, you can use the density and mass of a substance to determine its volume. When rearranged, the equation for volume becomes what is shown here - volume equals density divided by mass.

Module 1: What is Chemistry?
Topic 3 Content: Density Calculations Using Mass and Volume



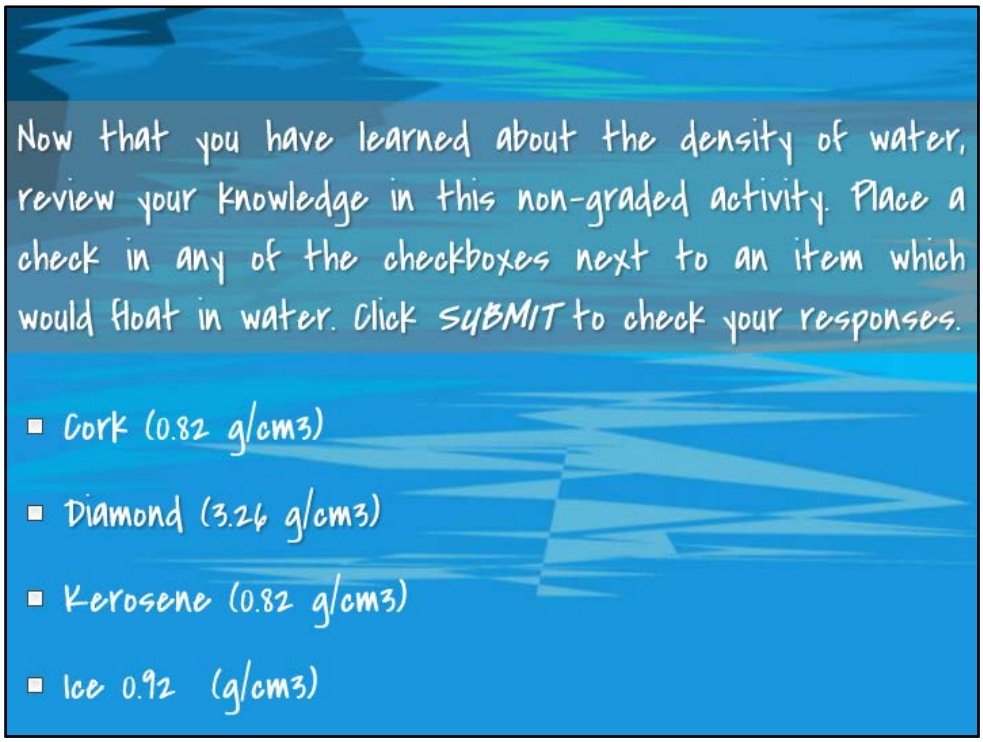
In this non-graded activity, calculate the volume of a substance using its density and mass. Calculate the volume of each of the metals shown in the chart and enter your answer in the blank provided. Make sure to use the correct number of significant digits. Then, click ***SUBMIT*** to check your response.

Module 1: What is Chemistry?
Topic 3 Content: Density Calculations Using Mass and Volume



The world's most abundant liquid, water, has a density of 1.0 g/mL. Objects with a density greater than 1.0 g/mL will sink in water. Objects with a density less than 1.0 g/mL will float in water.

Module 1: What is Chemistry?
Topic 3 Content: Density Calculations Using Mass and Volume



Now that you have learned about the density of water, review your knowledge in this non-graded activity. Place a check in any of the checkboxes next to an item which would float in water. Then, click ***SUBMIT*** to check your responses.