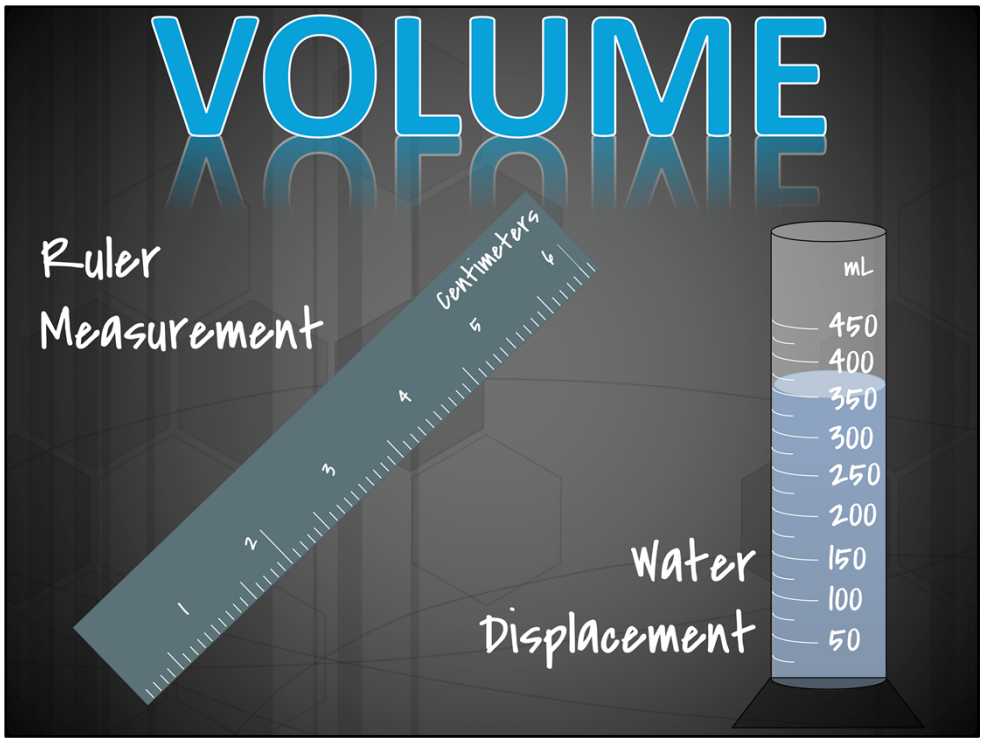
Module 1: What is Chemistry?
Topic 3 Content: Volume Presentation Notes



Volume can be determined two different ways, through water displacement or through ruler measurement. The nature of the object determines the method that is used.

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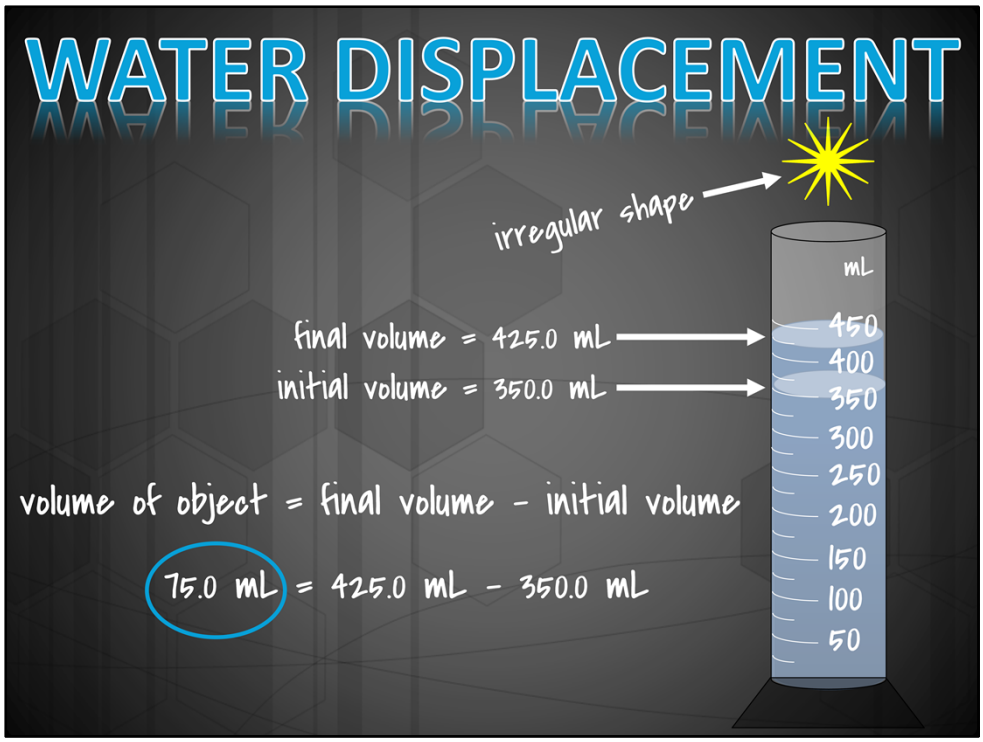

When an object cannot be measured using a ruler, you will need to use the water displacement method to determine the volume of the object. In other words, this is the method to use when an object has an irregular shape. Think about your surroundings; are there items whose volume you think would be difficult to measure?

To determine the volume of an object using water displacement, follow these steps:

- First, use a graduated cylinder that is large enough to hold the object.
- Next, fill the cylinder with enough water to ensure that the object will be completely covered with water when submerged. Record the initial volume of the water.
- Then, place the object in the cylinder. Record the final volume.
- Finally, subtract the initial volume of the water in the cylinder from the final volume of the water in the cylinder. The difference in the two volumes is the volume of the object.

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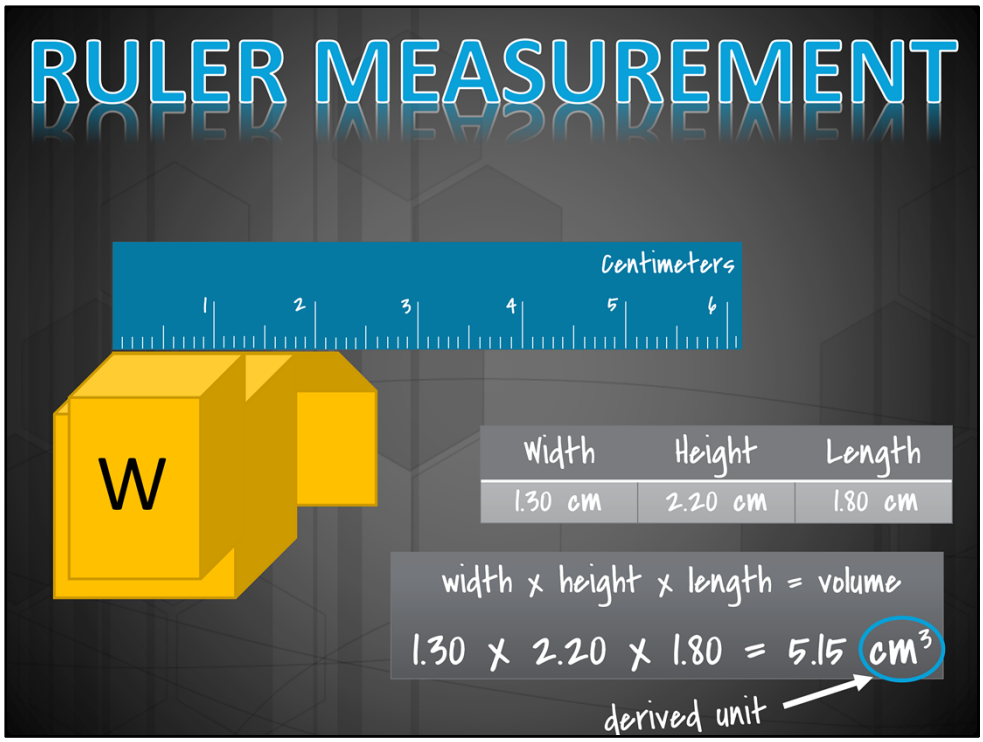

If the object is a regular shape like a cuboid or prism, you can calculate volume using a ruler to measure the width, height, and length of an object. View this example using a rectangular cuboid-shaped piece of gold. You will need three different measurements to calculate the volume. First, you measure the width of the cube. It appears to be 1.30 centimeters. Next, you measure the height of the cube, and it appears to be 2.20 centimeters. Finally, you measure the length of the cube and you find that it is 1.80 centimeters. Once you have obtained all three measurements, you will need to multiply them in order to find the volume of the object. Here you see that the volume of this object is 5.15 cm^3. Cm^3 is called a derived unit because it is a combination of SI base units. There will be many other derived units that you will use in chemistry, including units for energy, molarity, and molar mass.