

Measuring Volume

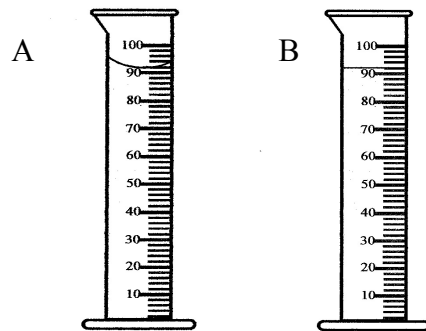
The volume of an object is the amount of space it takes up. Volume is measured using metric units such as milliliters (mL). Liquid volumes are measured in the science laboratory with a graduated cylinder.

Graduated cylinders are made of two different types of material - plastic and glass. Measuring with a glass graduated cylinder is complicated somewhat by a meniscus. A meniscus is the curvature of the surface of the water.

Water “sticks” to the walls of the glass graduated cylinder. When you look at the surface, the water level is not straight. You should always read the measurement at the lowest point of the curve.

You need to read the graduated cylinder at eye level in order to get an accurate reading. You should place the graduated cylinder on the table and then lower your head to be able to read the amount at eye level. A plastic graduated cylinder does not have a meniscus.

Glass or Plastic - Which is which?



Materials: 4 large graduated cylinders filled with different colored water, 1 glass graduated cylinder per table, 100 ml plastic graduated cylinder, paper cup, jar, plastic bottle, water bottle (with fill line drawn on them) bottles of water, beaker, medicine dropper

What To Do:

1. When your teacher calls your table, go up to the large graduated cylinders and record the volume of each in the space below.
2. While you wait to be called use the beaker to pour 95 mL of water into the glass graduated cylinder and observe the curve at the top of the water.

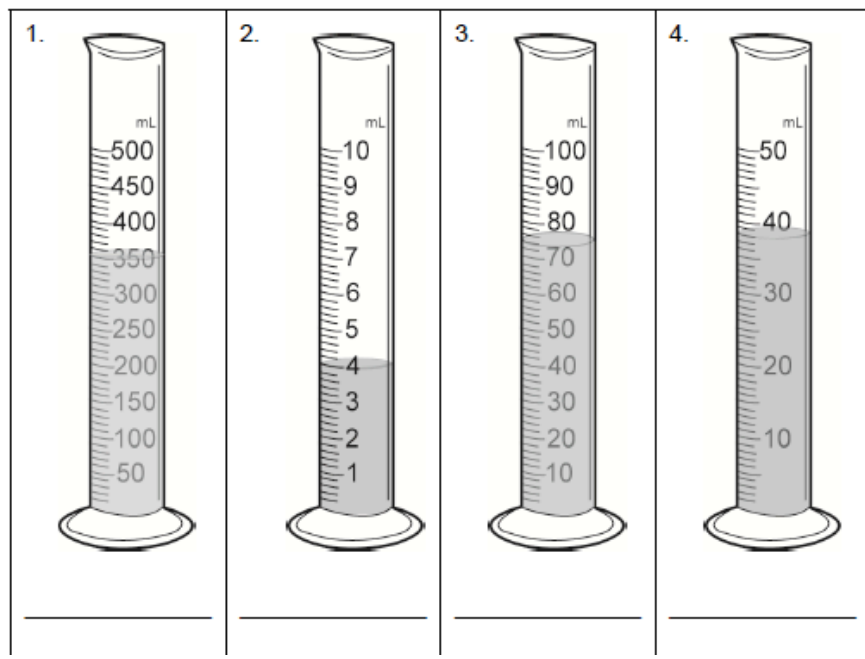
Hint: Pour about 90 mL of water into the graduated cylinder. Use the medicine dropper to add water to get exactly 95 mL.

3. Pour 95 mL of water into the plastic beaker and observe the lack of a curve at the top of the water.
4. For the rest of the activity use the plastic graduated cylinder. Don't forget the units!

- | | Volume |
|---|--------|
| 1. Volume of the graduated cylinder with red water. | _____ |
| 2. Volume of the graduated cylinder with blue water. | _____ |
| 3. Volume of the graduated cylinder with green water. | _____ |
| 4. Volume of the graduated cylinder with yellow water. | _____ |
| 5. Pour water to the fill line on the paper cup. Use the graduated cylinder to measure the volume of water. | _____ |
| 6. Pour water to the fill line on the jar. Use the graduated cylinder to measure the volume of water. | _____ |
| 7. Pour water to the fill line on the plastic bottle. Use the graduated cylinder to measure the volume. | _____ |
| 8. Pour water to the fill line on the water bottle. Use the graduated cylinder to measure the volume. | _____ |




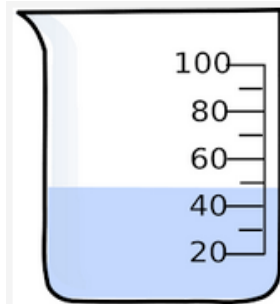
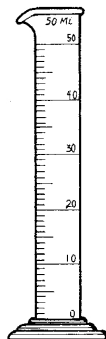
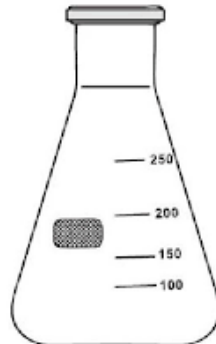
1. What type of graduated cylinder is shown? _____
2. How do you know? _____
3. Where do you read the measurement? _____
4. What is the curved line called? _____
5. Observe the following graduated cylinders and determine the volume AND their unit of measure. Don't forget units!



Scientists use other tools to measure volume. A pipette is used when a very small amount of liquid is needed. A beakers - the cup with the bird-like beak and a flask - a triangular shaped vessel are good for estimating the amount of liquid but to get an accurate measurement you must use a graduated cylinder.

DON'T GLUE Whole Page IN NOTEBOOK!

Read the paragraph on the last page and label each of the tools shown below. Under each flap tell something about how a scientist might use it.

<p>Glue to notebook</p> 	
 <p>A</p>	



Exit Ticket

Measuring Volume

In the space below complete a “quickwrite” telling your friend in another class how to tell a glass graduated cylinder from a plastic graduated cylinder when they are found on a test question.

Conclusion: (graduated cylinder, milliliter, plastic, bottom, curvature, meniscus)

To measure volume in the science lab we use a

_____. The unit for volume in the metric system is the _____. A glass graduated cylinder has a _____, which is a _____ of the surface of the water. A _____ graduated cylinder does not have a meniscus. When reading the curve of the meniscus always read at the _____ of the curve.



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