

Volume: 1.C.I

Measurements of Water

Grade Level	1
Sessions	Session I: Making Volume Measurements – 45 minutes
Seasonality	N/A
Instructional Mode(s)	Whole class
Team Size	N/A
MA Frameworks	<p><u>Skills of Inquiry</u></p> <p>2. Tell about why and what would happen if?</p> <p>3. Make predictions based on observed patterns.</p> <p>4. Name and use simple equipment and tools (e.g. rulers, meter sticks, thermometers, hand lenses, and balances) to gather data and extend the senses.</p> <p>6. Discuss observations with others.</p> <p><u>Physical Sciences</u></p> <p>2. Identify objects and materials as solid, liquid, or gas. Recognize that solids have a definite shape and that liquids and gases take the shape of their container.</p> <p><u>Technology/Engineering</u></p> <p><i>1. Materials and Tools</i></p> <p><u>1.3</u> Identify and describe the safe and proper use of tools and materials (e.g., glue, scissors, tape, ruler, paper, toothpicks, straws, spools) to construct simple structures</p>
WPS Benchmarks	<p>01.SC.IS.02</p> <p>01.SC.IS.03</p> <p>01.SC.IS.04</p> <p>01.SC.IS.06</p> <p>01.SC.PS.01</p> <p>01.SC.TE.03</p>
Key Words	Measurement, ruler, volume

Summary

This lesson will introduce students to the concept of volume and measurements associated with volume. The students will use rulers to learn how to measure the volume of water in plastic cups.

Learning Objectives

Massachusetts Frameworks for Grades Pre K-2

Skills of Inquiry

2. Tell about why and what would happen if?
3. Make predictions based on observed patterns.
4. Name and use simple equipment and tools (e.g. rulers, meter sticks, thermometers, hand lenses, and balances) to gather data and extend the senses.
6. Discuss observations with others.

Physical Sciences

2. Identify objects and materials as solid, liquid, or gas. Recognize that solids have a definite shape and that liquids and gases take the shape of their container.

Technology/Engineering

1. Materials and Tools

1.3 Identify and describe the safe and proper use of tools and materials (e.g., glue, scissors, tape, ruler, paper, toothpicks, straws, spools) to construct simple structures

2002 Worcester Public Schools (WPS) Benchmarks for Grade 1

01.SC.IS.02 Tell about why and what would happen if?

01.SC.IS.03 Make predictions based on observed patterns.

01.SC.IS.04 Name and use simple equipment and tools (e.g. rulers, meter sticks, thermometers, hand lenses, and balances) to gather data and extend the senses.

01.SC.IS.06 Discuss observations with others.

01.SC.PS.01 Identify objects and materials as solid, liquid, or gas. Recognize that solids have a definite shape and that liquids and gases take the shape of their container.

01.SC.TE.03 Identify and describe the safe and proper use of tools and materials (e.g. glue, scissors, tape, ruler, paper, toothpicks, straws, spools) to construct simple structure.

Additional Learning Objectives

1. Understand the definition of “volume.”
2. Understand how to find volume.

Required Background Knowledge

1. None

Essential Questions

1. What is volume?
2. What is a measurement?
3. How do you measure volume?

Introduction / Motivation

Start with questions.

Procedure

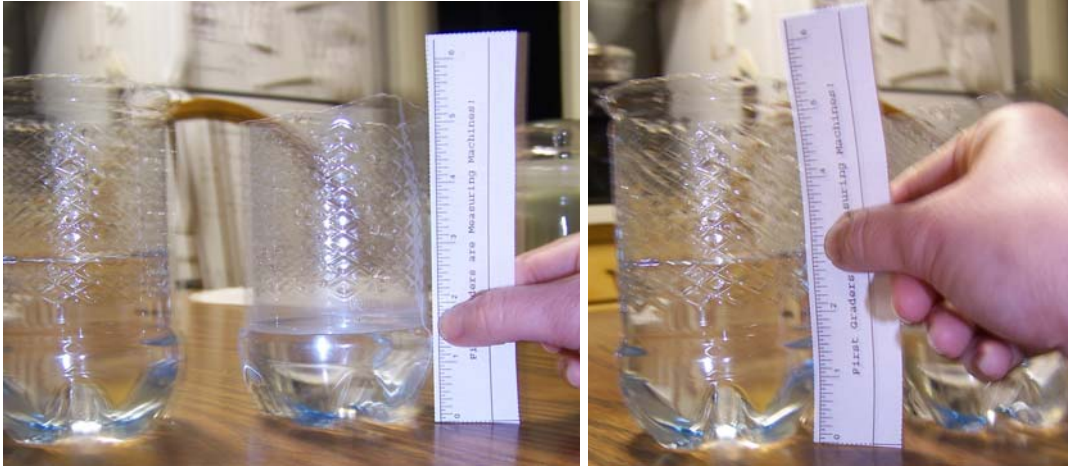
Session I: Making Volume Measurements – 45 minutes

Instructor preparation:

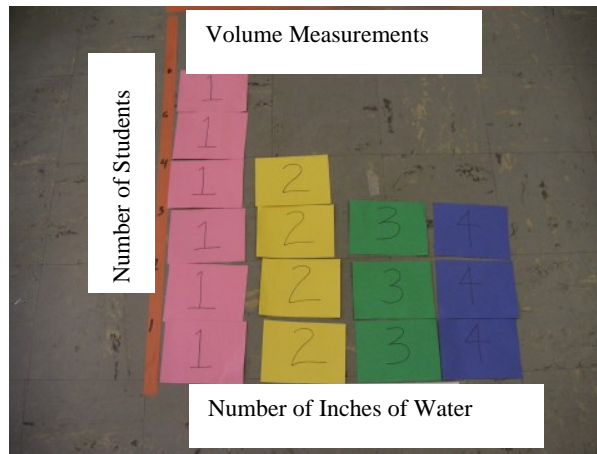
1. Photocopy the appropriate number of ruler handout so that each student has a ruler to cut out.
2. Fill plastic cups with an arbitrary amount of water for the students to measure.
3. Make labels for x and y-axis of graph as well as for the title. The x-axis should be “Number of Inches of Water”, the y-axis should be “Number of Students” and the title of the graph should be “Volume Measurements.”
4. Using 4 different colors make an appropriate amount of pieces of paper for graph and designate each color a number of inches (see figure after “the instructor will” step 5). Write that number on each piece of paper.

The instructor will:

1. Ask the students if they know what volume is and explain how it is not the volume of sound.
2. Explain the concept of volume to the students in terms of space and area.
3. Pass out outlines of rulers for the students to cut out and have the students cut them out.
4. Pass out plastic cups filled with various amounts of water to the students and have them measure how high the water is to the nearest inch with their rulers.



5. Create a graph on the floor to show how many students had each amount of water. Make columns of 1", 2", 3", etc. and have students place a piece of paper with the corresponding number in the correct column as shown below.



6. Ask the students questions about the graph. How many students had the most amount of water in their cups? How many students had the least amount of water in their cups?
7. Work on “What has the most volume?” handout.

Materials List

Materials per class	Amount	Location
Labels for the graph – use construction paper	1 per graph	Craft store
Graph numbers – 4 different colors of construction paper indicating the number of inches of water	Enough so that each student has the appropriate label	Craft store

Materials per student	Amount	Location
Ruler cut-outs	1 per student	Attachment section
Plastic cups with water	1 per student	Available at grocery stores, drug stores
“What has the most volume?” Handout	1 per student	Attachment section

Vocabulary with Definitions

1. *Measurement* – a number that describes how big something is (weight, length, height, volume, etc.).
2. *Ruler*- a device used for measuring length and making straight lines.
3. *Volume* – the amount of space occupied by a three-dimensional object or region of space.

Assessment / Evaluation of Students

The instructor may assess the students in any/all of the following manners:

1. Ask students to explain what volume is.
2. Ask students how to measure volume.
3. Check the number line and make sure that the students understand the concept of greater than and less than.

Lesson Extensions

This lesson prepares the students for later lessons about volume.

Attachments

1. “What has the most volume?” handout
2. Ruler Cutout

Troubleshooting Tips

N/A

Safety Issues

Students will be working with scissors and should be supervised at all times.

Additional Resources

None

References for Images Used

Ship - Microsoft Word – ClipArt

Cup - Microsoft Word – ClipArt

Bathtub – Microsoft Word – ClipArt

Swimming Pool – Microsoft Word – ClipArt

Sink – Microsoft Word – ClipArt

Fishing on Pond – Microsoft Word - ClipArt

Key Words

Measurement, ruler, volume

What has the most volume?

Number the bodies of water in order from lowest volume (1) to highest volume (6)



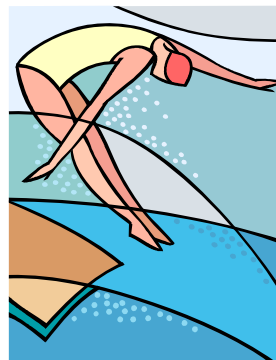
OCEAN _____



CUP _____



BATHTUB _____



SWIMMING POOL _____



SINK _____



POND _____



0 1 2 3 4 5 6

First Graders are Measuring Machines!



0 1 2 3 4 5 6

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0 1 2 3 4 5 6

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0 1 2 3 4 5 6

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