

## Lab Framework

**Text:** CORD Applied Math

**Unit number and title:** Unit 3 Measuring in English and Metric Units

**Short Description:** 1.A lab using balance beam scales and graduated cylinders to measure volume in metric units. 2. Use the data to identify unknown items by their density.

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### Lab Title

## Measuring volume and Mass in metric Units

### LAB PLAN

**TEACHER:** Teacher Prep/ Lesson Plan

- **Lab Objective**

1. To be able to use various pieces of lab equipment to measure metric units of volume and mass.
2. Use and manipulate the data gathered in step 1 to find the density of an object and its name.

- **Statement of pre-requisite skills needed** (i.e., vocabulary, measurement techniques, formulas, etc.)

1. Basic math skills
2. Knowledge of how to use:
  - a. Balanced Beam scale.
  - b. Graduated cylinder

- **Vocabulary**

Meniscus, gram, milliliter

- **Materials List**

1. 12 100 ml or larger graduated cylinders
2. 12 Balanced Beam scales
3. Data sheets

- **State Standards addressed**

Math: Math: 4.5.E Select and use one or more appropriate strategies to solve a Problem and explain why that strategy was chosen.

A1.1.A Select and justify functions and equations to model and solve problems.

3.5.C Estimate, measure, and compare weight and mass using appropriate-sized U.S. customary and metric units.

3.5.D Estimate, measure, and compare capacity using appropriate-sized U.S. customary and metric units.

Reading: TBD

Writing: TBD

- **Leadership Skills**

TBD

- **SCAN Skills/Workplace Skills**

TBD

- **Set-up information**
  1. Ensure each station has:
    - a. Graduated Cylinder
    - b. Balance Beam scale
    - c. Five different metal objects
    - d. Data sheets
- **Lab organization** (-Grouping/leadership opportunities/cooperative learning expectations; -**Timeline required**)
  1. Groups of two.
  2. Precision measuring techniques
- **Teacher Assessment of student learning** (scoring guide, rubric)
  1. Visual observation
  2. Assist in modeling the correct use of instruments
- **Summary of learning** (to be finished after student completes lab)
  - discuss real world application of learning from lab
  - opportunity for students to share/present learning
  1. Can objects composed of the same element, but different volumes have the same density?
- **Optional activities**
- **Career Applications**

**SKILL**

**CAREER**

Science technician, nurse,  
Lab technicians, Dentist

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## **LAB TITLE: Measuring volume and Mass in metric Units**

### **STUDENT INSTRUCTIONS:**

- **Statement of problem addressed by lab**
  1. Determine the volume and mass of different items using a Balance beam Scale and a graduated cylinder.
  2. Use the data gathered in step 1 to determine the density of the units.
- **Grouping instructions and roles**
  1. Groups of two
  2. One records while the other measures.
  3. Changes jobs at each new object is measured
- **Procedures** – steps to follow/instructions
  1. Obtain 5 objects
  2. Fill graduated cylinder to at least the 100 ml mark or half full which ever is larger. Record this number in milliliters.
  3. Measure and record the mass of an object using the balance beam scale.
  4. Carefully insert the object into the graduated cylinder.
  5. Record the volume by subtracting the starting volume from the new value and record in on the data sheet.
  6. Repeat steps 3 through 5 for each of the remaining objects.

#### **NOTE**

If any water was spilt either use the new volume or top off the cylinder to the original mark.

- **Outcome instructions**

A completed data sheet.
- **Assessment instructions** (peer-teacher)

N/A

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## Lab Data Collection

Student: \_\_\_\_\_ Date: \_\_\_\_\_

Unit: \_\_\_\_\_ Unit 3 \_\_\_\_\_

**Lab Title:** Measuring Mass and Volume in Metric Units

**Criteria:** Write the problem/objective in statement form

**Data Collection:** Record the collected/given data

Use Data Sheet

ITEM #	MASS In ml	VOLUME In grams	DENSITY
1			
2			
3			
4			
5			

**Calculations:** Complete the given calculations to solve for an answer(s)

Use the back of the data sheet for calculations

**Summary Statement:**

**Other Assessment(s)**

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