

Lab Framework

Text: CORD

Unit number and title: Unit 15 – Using Formulas to Solve Problems

Short Description:

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Lab Title

Using Formulas to Calculate Volume of Water Tank

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

Students are able to measure a water tank and determine the following:
Volume of the water tank

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

Student can use a measuring tape to measure a length

Student can take measurements and record the measurements

Student can apply conversion skills to relevant story problems

Student can add, subtract, and multiply units of measurement

- **Vocabulary**

Area; Dimensions; Length; Measure; Height; Width; Ratio; Proportional;
Scale, Volume

- **Materials List**

Measuring Tape

Scientific Calculator

Paper

Pencil or pen

- **State Standards addressed**

- **Math:**

- 1.1.4 - Apply understanding of direct and inverse proportions to solve problems.

- 1.2 - Understand and apply concepts and procedures from measurements.

- 2.2.2 - Apply strategies to construct solutions.

- 3.3.2 - Analyze thinking and mathematical ideas using models, known facts, patterns, relationships, counter examples, or proportional reasoning.

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- **Reading:**

- 1.2.2 - Apply strategies to comprehend words and ideas.

- 2.1.4 - Apply comprehension monitoring strategies for informational and technical materials, complex narratives, and expositions; use prior knowledge.

- 2.1.5 - Apply comprehension-monitoring strategies for informational and technical materials, complex narratives, and expositions; synthesize ideas from selections

- to make predictions and inferences.

- 2.3.4 - Synthesize information from a variety of sources.

- **Leadership Skills**

Student can lead a group to collect and record data
Student will make an individual presentation to the class

- **SCAN Skills/Workplace Skills**

Basic Skills: C

Writing: A

Mathematics: A; C

Thinking Skills: Creative Thinking; Problem Solving

Seeing Things in the Mind's Eye: A; B

Reasoning: A; B; C

Personal Qualities:

Responsibility: B

Self-Management: A; C

- **Set-up information**

Prior to class put on the teacher's desk the following materials:

Tape Measures

Paper

Rulers

- **Lab organization** (-Grouping/leadership opportunities/cooperative learning expectations; -**Timeline required**)

Divide class into work groups.

Members of group determine: who will read the tape measure; who will hold the end of the tape; who will record the measurements

Time required: 5 minutes

- **Teacher Assessment of student learning** (scoring guide, rubric)

Scoring Guide with scoring rubric

- **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

How skill helps in determining size of container for water storage of a set volume

Discuss ways that skill could help student select water tanks for farm animals

Discuss ways to present data to an audience

- **Optional activities**

Measure a can and determine its volume

Measure a ball and determine its volume

- **Career Applications**

Construction

Engineering

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LAB TITLE:
Using Formulas to Calculate Volume of Water Tank

STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**
You are to measure the water tank to determine the volume of water that it can contain.
- **Grouping instructions and roles**
The class will be divided into groups of 3 students by the teacher.
Each group will have the following roles:
 - Holder of end of tape
 - Reader of measurement
 - Recorder of measurements
- **Procedures – steps to follow/instructions**
 1. Collect a tape measure from teacher
 2. Measure the circumference of the water tank
 3. Record the measurement
 4. Measure height of the water tank
 5. Record the measurement
- **Outcome instructions**
After the measurements have been recorded, the group gets together to calculate the volume of the water tank
- **Assessment instructions (peer-teacher)**
 - Assess correctness of measurements
 - Assess proper calculation of volume of water tank

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Lab Data Collection

Student: _____ Date: _____

Unit: _____

Lab Title:

Using Formulas to Calculate Volume of Water Tank

Criteria: Write the problem/objective in statement form

Data Collection: Record the collected/given data

Circumference of Tank: _____

Height of Tank: _____

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

Volume of Tank: _____

Summary Statement:

Other Assessment(s)

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Grading Rubric for Lab

Topic	Points Possible	Points Earned
Measuring of circumference	5	
Measuring of Height	5	
Calculation of Volume	15	

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