

Lab Framework

Text:CORD Classic

Unit number and title:Unit 8 Working with Three Dimensional Objects

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Lab Title Body Volume

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Short Description: Using direct measurement, estimation, volume formulas and conversions, the student determines their body volume in cubic inches.

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**
To determine your body volume
- **Statement of pre-requisite skills needed** (i.e., vocabulary, measurement techniques, formulas, etc.)
Must know the formulas for the volume of a sphere, cylinder and rectangular solid. Must know how to do unit conversions.
- **New Vocabulary**
lateral, conversion, trunk(shoulders to butt)
- **Materials List**
Meter stick, measuring tape, calculator
- **GLEs addressed**
Math: 1.18 estimation, .125 using formulas
Reading:
Writing:
- **Leadership Skills**
1.3,1.4
- **SCAN Skills**
Arithmetic
A. Perform basic computations.
C. Makes reasonable estimates.
- **Set-up information**
Have meter sticks and measuring tapes
- **Lab organization**(-Grouping/leadership opportunities/cooperative learning expectations; -**Timeline required**)
Work in pairs, 50 minute period to finish
- **Teacher Assessment of student learning** (scoring guide, rubric)
Student will be able to explain using words and diagrams how they solved the problem
- **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

- **Optional activities**
A. Conversion of volume in gallons to liters (a gallon is 3.8 liters)

B. Talk about the water displacement method you can use to determine the volume of oddly shaped objects.

C. Each gallon of water weighs 8.34 lbs. Use this data to calculate your "experimental" weight and compare it to your actual weight.

- **Career Applications**

Sculptor, any occupation that involves design of clothing.

LAB TITLE: Whole Body Volume

STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**
Determine the volume of your body in cubic inches. See the student lab report data section for more details
- **Grouping instructions and roles**
Work in pairs
- **Procedures** – steps to follow/instructions
See below at Data Collection
- **Outcome instructions**
Turn in your completed data charts and put away all tools.
- **Assessment instructions** (peer-teacher)
Student will be able to explain using words and diagrams how they solved the problem.

Lab Data Collection

Student: _____ **Date:** _____

Unit: Unit 8 Working with Three Dimensional Objects

Lab Title: Whole Body Volume

Criteria: Write the problem/objective in statement form

Using volume formulas, measurement and estimation you will determine the volume of your body in cubic inches.

Data Collection: Record the collected/given data

If you were hollow and we were able to put a funnel in the top of your head and fill your shape up with water, what would your volume be in gallons? Make a guess before you start.
My volume guess in gallons is _____

Our determination is going to be very approximate. Make all of your measurements to the nearest inch.
You may need to take several measurements and use an average. As an example, on your leg you may need to measure the radius at your ankle, knee and thigh and use the average. The average of these numbers would give you a radius. If you then measure the length of your leg and you picture your leg as a cylinder, you can now determine the volume of your leg. Multiply this by 2 and you have your legs taken care of. For your head you can assume that it is like a sphere, your body trunk (shoulders to bottom of butt) a rectangular solid, etc.

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

A. Given that 1728 cubic inches equals 7.5 gallons, change your body volume in cubic inches to gallons.

B. One gallon of water weighs 8.34 lbs. Convert your volume to pounds.
How close is your weight determination to your actual weight?

Summary Statement:

Other Assessment(s)