

Lab Framework

Text: CORD Classic

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

Short Description: This lab helps students to become familiar with vernier calipers, as well as how to read both the standard and metric measurements on the calipers.

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Lab Title

Block sizing with Vernier Calipers

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

Familiarize students with Vernier Calipers, as well as reading measurements in both standard and metric systems of measurement. Students are to work alone for the lab, but can obtain assistance from other students.

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

Students must have basic measuring knowledge, and how to read a ruler.

- **Vocabulary**

Vernier, Calipers, Tenths, Hundredths

- **Materials List**

25 Vernier Calipers
25 4"x1"x.5" Blocks of wood
25 Pieces of Sandpaper

- **State Standards addressed**

Math: 1.1 - Understand and apply concepts and procedures from number sense, 1.2 - Understanding and apply concepts and procedures from measurements, 1.5 - Understand and apply concepts and procedures from algebraic sense, 2.1 - Define problems, 2.2 - Construct solutions, 3.1 - Analyze information, 3.2 - Conclude, 3.3 - Verify results, 4.1 - Gather information, 4.2 - Organize, represent, and share information, 5.3 - Relate mathematical concepts and procedures to real world situations

Reading: 1.2 - Use vocabulary (word meaning) strategies to comprehend text

Writing: (none)

- **Leadership Skills**

In this unit, students can show others how to work vernier calipers so that they can get desired readings.

- **SCAN Skills/Workplace Skills**

- 1- Performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques.
- 2- Knowing how to learn: uses efficient learning techniques to acquire and apply new knowledge and skills.
- 3- Time: selects goal-relevant activities, ranks them, allocates time, and prepares and follows schedules.
- 4- Teaches others new skills

- **Set-up information**
3 boxes – Each box will contain either the calipers, blocks, or sandpaper.
- **Lab organization**(-Grouping/leadership opportunities/cooperative learning expectations; -**Timeline required**)
 - 3 minutes – Students gather required materials for lab
 - 2 minutes – Students take preliminary measurements of blocks
 - 25 minutes – Students sand down blocks to the desired exact sizes
 - Students with better comprehension of unit can assist helping to size up/down blocks, and showing others how to read the calipers.
- **Teacher Assessment of student learning** (scoring guide, rubric)
When each student is finished sanding down the block to the set size, they will read off the measurements of the block, and show the teacher what the measurements looks like on vernier calipers.
- **Summary of learning** (to be finished after student completes lab)
During this activity, the student will become familiar with the vernier calipers, which helps in many professions. One profession would be an auto mechanic; many mechanics must learn how to use calipers to determine whether a part is within tolerances. They will present their findings to other students, and compare their measurements with other students to see if they are in agreement with each other.
- **Optional activities**
If calipers are not readily available, rulers can be used as well, or instead of using wood blocks, you can use any object(s) that can be easily sanded down, such as wax, or food items.
- **Career Applications**
 - Auto/Motorcycle Mechanic
 - Personal Trainer
 - Chef
 - Woodworker/Carpenter

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LAB TITLE: Block Sizing with Vernier Calipers

STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**
Students must sand down block to a specified size.
- **Grouping instructions and roles**
Students are to work alone, but can have help from others in identifying how to use the calipers, as well as how to read the calipers.
- **Procedures** – steps to follow/instructions
Watch demonstration on how to properly use and read the vernier calipers. After the demo is done, get your own block, your own set of calipers, and your own piece of sandpaper. After obtaining your equipment, start sanding down the block to the specified size given to you by the teacher. When you feel you have sanded your block down to the correct size, show the teacher.
- **Outcome instructions**
Once finished sanding the block, student should have basic understanding how a vernier caliper works, and how to read one.
- **Assessment instructions** (peer-teacher)
The student is to show the teacher that the block that they sanded down matches the size requirements given to them by the teacher.

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Lab Data Collection

Student: _____ Date: _____

Unit: _____

Lab Title:

Criteria: Write the problem/objective in statement form

Data Collection: Record the collected/given data

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

Summary Statement:

Other Assessment(s)

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