

Lab Framework

Text: CORD

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

Short Description:

In this Lesson the students will be able to breakdown the inch into one/sixteenths to be able measure each part of their project. After each part of the unit a project is measured the student will calculate the board ft. of each part to figure the total board feet for their project. The student will then be able to calculate the total Board Feet used in figuring the total cost of their project.

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Contact Information: La Center High School

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Lab Title

Application to Measuring to Convert to Board Ft

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

Students can:

1. **Understand the common measurements for Length, Area, Volume used in the English System.**
2. **Convert the measurements of length to calculate the total Board Feet of Lumber for project construction.**
3. **Read measurements taken with common measuring tools.**
4. **Use measuring tools to measure several parts of a drawing to figure total cost of their project.**

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

Review breakdown of the measuring tape marking and fractions
Students should know about fraction to measure accurately

- **Vocabulary**

1. Inches
2. Feet
3. Yards
4. Other markings on a measuring tape
5. Board Feet

- **Materials List**

Several Boards at random widths and Lengths

10 Measuring Tapes

Student calculation sheet to write measuring for each section

- **State Standards addressed**

Math: 1.2,1.2,1.51, 1.51,1.5.6,2.1,2.1.1,,2,2.2.2,3.1.1,3.2,3.2.2,3.3,3.3.1,3.3.2,
4.1,4.1.1,5.1,5.1.1,5.1.2,5.2.1,5.3,A1.3,G.6.C,G6.E.

- **Leadership Skills**

Students enrolled in the class will be part of Navigation 101.
 Students will work in groups of two to show cooperation.
 One student will leadership role in recording all measurements.
 Students will work together to calculate the cost of each section of lumber.
 Group will switch off to report to the instructor the total amount of the
 of lumber for each station.
 Students then will start review of how to read a drawing of their project.
 Later in the class students will visit a Cabinet shop to see how lumber is
 purchased to make cabinets.

- **Set-up information**

The purpose of this lesson is for students to be able to measure, calculate correctly the amount of board feet it takes to build their project.

The students will also be able to calculate the total cost of the lumber they are going to select to build their project.

Procedure:

1. Students will take a sheet of paper and fold it into sixteen different units. They will start with folding it in the middle until they have sixteen fold lines.
2. Students will mark each fold line each 1/16 unit 1/16-1/8 3/16-1/4-5/16-3/8-5/16-3/8-7/16-1/2-9/16-5/8-11/16-3/4-13/16-7/8-15/16-1 inch.
3. Student will be given a tape measure and see all the marking in the inch.
4. The following terms will be discussed:
 - A .Foot
 - B.16 inch markings
 - C. yard
5. Board dimension will be introduced :
 - a.Thickness
 - b. Width (across the grain)
 - c. Length (with the grain)
 - d. Board feet
6. Students will be given 6 board of different sizes and will begin to measure each board recording the Thickness, Width, and Length of each board to the sixteenth of a inch. A handout will be provided to record the sizes. Boards will be marked by number and groups. Each group will rotate until the class has measured each group.
7. Each group will have a different kind of wood so students keep track of what kind of wood is in each section.

8. Introduction of board feet will be demonstrated using the following formula:

$$\frac{T \times W \times L}{144''} \qquad \frac{T \times W \times L}{12'' \times 12''}$$

9. Using the formula students will have to figure out the total amount of bd ft for each section.
10. Students will be given the cost sheet of the cost of each kind of Wood.
11. Students will have to calculate the cost of each section of lumber and then the total cost of all the sections.
12. Next lesson the students will be given a 3 D drawing of a project they are going to build and have to figure the about of board feet for each part.
13. Students will have to figure the cost of the project to complete this assignment.

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

The assessment of the student will be measured on the accuracy of each board, the Calculation of the amount of board feet for each board, the cost calculation of each board, the cost of the each section and the total calculation of all the sections.

- **Summary of learning**

Each group of students will have to discuss their answer before the group and what was the quickest way to find their answers.

Invite a Cabinetmaker to come in to relate how different ways lumber is purchased and how cost is different in lumber.

- **Optional activities**

Field trip to a cabinet shop will help students better understand the cost of lumber.

- **Lab organization- Leadership**

In the next few days the students in this Lab will develop a project using their calculations

Navigation 101 is being presented to the students

Skills USA leadership is encouraged for students in all CTE programs

Guest speaker that relates to the students activity will be invited to talk with the students

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

Students will be evaluated on all handouts used for the lesson.

Students will be evaluated on participation points daily.

Students will be evaluated on the completion of their project.

- **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

Field trip to a cabinet shop will help students better understand the cost of lumber.

Career Applications Skills

Measuring

Calculating number in inches and fractions.

Using formulas for Board feet

Calculation of Cost of lumber

Occupation that relate to the lesson

Construction

Cabinetmaking

Sheet metal worker

Engineering

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LAB TITLE: _____

STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**

- **Grouping instructions and roles**

- **Procedures** – steps to follow/instructions

- **Outcome instructions**

- **Assessment instructions** (peer-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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