

Creating a Bill of Materials

Summary

This lesson introduces students how to calculate board feet and write a bill of materials. Students will be able to understand when a bill of materials is needed and how to create one.

Time Frame

1 class periods of 45 minutes each

Life Skills

Thinking & Reasoning, Employability

Materials

There are two worksheets that I have added to this lesson. The first helps students to practice calculating board feet. The second is to give students an actual bill of materials for a shelf and have them calculate the cost for the project.

Precut three pieces of wood to the following dimensions:

1" x 12" x 12"

2" x 6" x 12"

2" x 3" x 24"

Collect a couple of miscellaneous boards to calculate board feet.

Have a sample project that the students might complete in the class.

Background for Teachers

There are three main components of a bill of materials. They are the types of wood, board feet of each piece, and the price per board foot. The first step in creating a bill of materials is to calculate the board feet for each piece. Solid lumber comes in random widths and lengths. Without the proper calculation of board feet, you might not have enough wood for a project. The formula for calculating board feet is quite simple. It is the number of pieces that are the same dimensions times the thickness, times the width, times the length, all divided by 144.

(# of pieces x thickness x width x length)

144

To calculate board feet, first measure the thickness, width, and length of each piece and write it down on a sheet of paper. Second, group pieces with the same dimensions together. Third, use the formula to calculate board feet for each piece of the project. After the board feet has been calculated then you can finish the bill of materials by multiplying the board feet of each piece by the price of the wood you will use. Then add the prices together to calculate the total cost of the project. Become familiar with this process and practice so that you can help the students.

Student Prior Knowledge

Students should know how to use and read a tape measure.

Intended Learning Outcomes

Demonstrate how to calculate board feet.

Demonstrate how to create a bill of materials.

Instructional Procedures

Show the students an example of pieces of wood that are one board feet. Examples might include a board that is 1" x 12" x 12", 2" x 6" x 12" or 2" x 3" x 24". Multiply the three dimensions together to show that they are all equal.

Show the other miscellaneous boards that you have previously chosen. Ask the students how they could figure out the board feet if they are not the exact measurements of the previous pieces of wood.

Write the formula for calculating board feet on the board. Calculate the board feet for the miscellaneous boards.

4. (# of pieces x thickness x length x width)

144

Distribute the calculating board feet worksheet to the students for practice. Calculators are not necessary since the answers are whole numbers.

Show students an example of a small project that they will make in class. Explain that it is important to know the materials used in the project to calculate the cost of the project and to know how much material is going to be used.

Demonstrate how to measure each piece and then how to make up a bill of materials.

Distribute the sample bill of materials and have students calculate the cost of the project.

Conclude with some careers that will need to create a bill of materials and to calculate board feet.

Assessment Plan

Student performance will be assessed using the calculating board feet worksheet and the bill of materials worksheet. Students could also be given a small project and told to create a bill of materials for it. See attachments above.

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