Lesson Name: Calculating Board Feet Lesson
Course: Woods
Grade Level: 9-12
Unit: Materials in Woodworking

Goals:
Students will be able calculate the board feet and select the appropriate size boards and amount of lumber required to build a project.

Objectives:
- Understand the difference between nominal and actual sizes of lumber
- Understand how softwood and hardwood lumber sizes are identified
- Identify the thickness, width, and length of a board to calculate board feet
- Be able to identify the parts of a board: face, edge, end grain

Time Frame:
- This lesson should take 2-3 class periods

Materials:
- Lumber Sizing and Calculation Presentation (Resource)
- Birdhouse Blueprint
- Calculator
- Various pieces of hardwood lumber
- Tape measures

Procedure:

Day 1: Direct Instruction and Activity
1. Go through the Lumber Sizing and Calculation Presentation
2. Demonstrate calculating board feet with your own lumber sample.
3. Have students in groups of 3-4 measure the piece of lumber at their workbench and complete the "Calculating Board Feet and Cost Activity". Write their answers on the board and go through each sample confirming they found the correct measurements and board feet.
4. Hand out the Lumber Sizes Assignment worksheet to complete as classwork / homework due the next day. They should use the presentation as a resource.

Day 2: Application
1. Review the worksheet from yesterday, confirming their answer to questions 12 and 13 which were calculating board feet and cost.
2. Hand out the Birdhouse Blueprint and have them calculate the board feet needed for the project.
3. For bonus have them look up the price of Poplar lumber to determine how much it would cost for them to purchase the lumber for the project.

Assessment:
- Lumber Sizes Assignment Worksheet is graded
- Calculating Board Feet and Cost Activity worksheet is graded
- Birdhouse Project: Calculating Board Feed worksheet is graded

Name: _____

Period:_____

Calculating Board Feet and Cost Activity

Team Names: _____

1. What is the thickness, width, and length of the board on your table?

   _____ x _____ x _____

2. How many cubic inches is it? _____

3. How many board feet is your board? _____

4. What type of wood is your board? _____

5. Conduct online research and find out how much it costs per board foot based on the wood type: _____

6. How much does your board cost? (Board Foot x Cost) _____

Lumber Sizes Assignment

Directions: Go to the Unit 1 folder in Schoology and use the "Actual vs. Nominal Lumber Sizes" article and "Lumber Sizes Presentation" to answer the following questions.

1. What is the difference between the nominal size and actual size of a board?

2. Hardwood is typically sold by a unit of volume known as _____ _____

3. The term _____ _____ is used with softwood species that used in the building trades.

4. What is the history behind why a 2"x4" does not actually measure 2" by 4"?

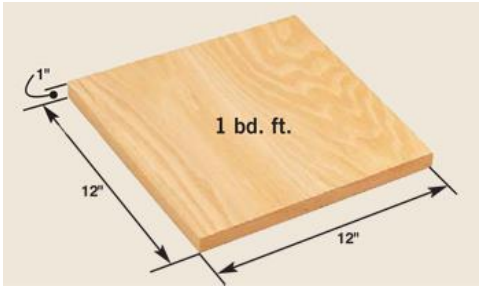
5. What are the actual measurements of a 2"x4"? _____

6. What are the actual measurements of a 2" x 2"? _____

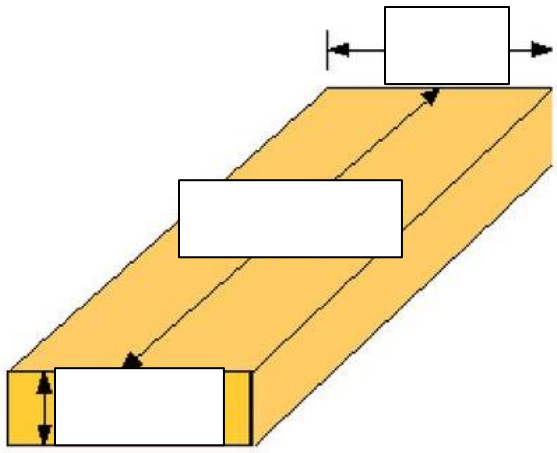
7. What are the actual measurements of a 2" x 8"? _____

8. Shrinkage of a board is more pronounced _____ a board than _____.

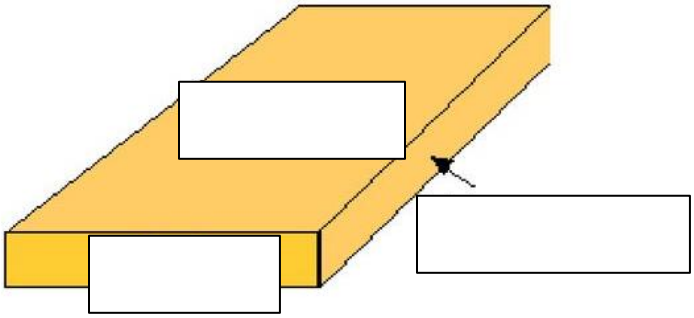
9. One board foot is equal to _____ cubic inches.



10. Identify the Thickness, Width, and Length of a board:

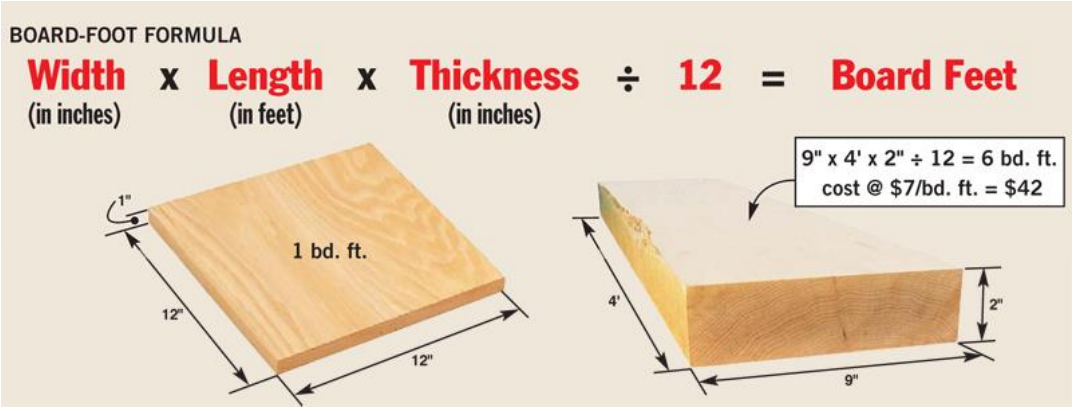


11. Where is the Face, Edge, and End of a board?



12. When buying hardwood lumber (oak, poplar, maple) you are going to purchase it by the board foot. If you want to buy a board that is 2” x 7” x 8’ (T x W x L) how many board feet are in that board? _____

13. If the board in problem 12 costs $5/bd. ft how much does it cost? _____



Birdhouse Project: Calculating Board Feet Activity

Using the blueprint plans, calculate how many board feet you will need to build the birdhouse.

1. What is the total <u>length</u> of lumber needed? _____
2. How <u>wide</u> of a board will you need to cut all your pieces? _____
3. Assume the <u>thickness</u> of the material is ¾”
4. Calculate the board feet (T x W x L / 144) _____
5. If your material is $5/per board feet how much will your lumber cost? _____