

Angles, Measurements, and Structure with Carpentry

WebQuest Description: This is designed to help students get a real understanding of angles, measurements, and structure.

Grade Level: 9-12

Curriculum: Math

Keywords: Angles, measurements, formulas, structure, strategy

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Introduction

Have you ever constructed something out of blocks of wood and other materials? Well when doing so, you will need to use angles to make the structure of your object. We will investigate what angles are used and what angles you would use if you were making different structures.

Tasks

Since we will be working with angles this is a fun and interesting way to help you, the student, understand the concepts. When you think of an object like a birdhouse, a general image comes to mind. But, did you know you can create them differently depending on what angles you use what materials you use, what size bird you want to cater to, and how you want it to look. We are going to explore some different ways on how to make different birdhouses with different angles and concepts.

Process

You will all be making birdhouses in this lesson. You will be using angles to measure out your birdhouse dimensions. Please take a look at the link below that describes the different sizes bird entrance holes need to be for different sized birds. That is the only part you will need to look at on this link. Your birdhouse will not be a traditional birdhouse. You will look at the 3 pictures I have below and look and which one you would like to choose and make your own. I would like you to turn and talk with a classmate and brainstorm ideas. Your finished product does not have to look exactly like these examples. Your birdhouses will be made of whatever you may have at your disposal. So you might have materials like cardboard, tin cans, Popsicle sticks, wood, scrap metal, corks, rocks, sticks, paper towel tubes, license plates, pails, and anything else you can find and use that would be stable for a birdhouse. You will be doing this project at home but I will want a step by step procedure of when and how you make your birdhouse. I would like you to write down the different materials used, the different angles measured, and the steps to put it together. You should measure what angle the roof is placed, what angles the sides are placed, and what angles the front and back pieces are placed. Your siblings and parents may help but you must do most of the work. Please use safety procedures when working with wood. Have an adult help you with that process. We will be bringing the step by step procedures and birdhouses into class so we can discuss how you created your birdhouse and what your birdhouse looks like. I hope you enjoy the lesson.

Evaluation

You will be graded on a rubric style scale 1-4. I will be grading you on the construction and materials used, your planning and written process, and the function of the birdhouse.

Category and Score	4	3	2	1	Score
Construction/ Materials	Appropriate materials were selected and creatively modified in ways that made them even better.	Appropriate materials were selected and there was an attempt at creative modification to make them even better.	Appropriate materials were selected.	Inappropriate materials were selected and contributed to a product that performed poorly.	Total:
Function	Structure functions extraordinarily well, holding up under atypical stresses.	Structure functions well, holding up under typical stresses.	Structure functions pretty well, but deteriorates under typical stresses.	Fatal flaws in function with complete failure under typical stresses.	Total:

Category and Score	4	3	2	1	Score
Process	Process provides a complete record of planning, construction, testing, modifications, reasons for modifications, and some reflection about the strategies used and the results.	Process provides a complete record of planning, construction, testing, modifications, and reasons for modifications.	Process provides quite a bit of detail about planning, construction, testing, modifications, and reasons for modifications.	Process provides very little detail about several aspects of the planning, construction, and testing process.	Total:
Plan	Plan is neat with clear measurements and labeling for all components.	Plan is neat with clear measurements and labeling for most components.	Plan provides clear measurements and labeling for most components.	Plan does not show measurements clearly or is otherwise inadequately labeled.	Total:
				Total Score	

Conclusion

In this lesson we looked at the different angles and entrance hole sizes for the making of a birdhouse. You all made your own houses out of everyday materials you found. You learned about how to use angles to make a structure stronger. Since you all have your birdhouses, I would like you to all find a place to put your new birdhouse. Somewhere close to your house, a family members house, or in your town anywhere you like. You also learned how to make a home for a bird that may be looking for a place to stay. This project can be replicated whenever you would like on your own time. You could do this project with younger cousins, siblings, or parents. Now since you have a better understanding of angles, you can use this knowledge to make more objects of your own creation. You can help make a structure with a family member or you can think of something more creative!! hope you really enjoyed this unit and I hope it gave you more interest in math or in creating things. Thank you for participating and if you have any additional questions you may ask me at any time.

Teacher Page

Standards

The math standards addressed:

Apply geometric concepts in modeling situations

1. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).
2. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).

The reading standards addressed:

7. Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.
9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Credits

This webquest was made with the help of Cindy Wells and come collaboration from other peers. I used images from google images. I would like to thank Cindy Wells for helping me create this idea for a lesson and helping me elaborate on it. I learned how to build a webquest from SECD 356 by the instruction of Cindy Wells.

Other