

**Science Unit: Structures****Lesson 3: Domes and Towers**

School year: 2008/2009

Developed for: Britannia Elementary School, Vancouver School District

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Grade level: Presented to grades 3 and 4; appropriate for grades 3 – 7 with age appropriate modifications.

Duration of lesson: 1 hour and 15 minutes

Objectives

1. Discover features that allow tall towers to be built.
2. Explore how domes are built.

Background Information

This is the third in a six-part series of lessons on “Structures.” This activity will build on what the students have learned in the first two lessons (“These Are The Structures In Your Neighbourhood [an introduction to structures] and “Fascinating Fasteners) as students will start to build different types of structures (towers [and domes if you do the extension to the lesson]), exploring and discovering features of structures that make them strong and stable.

Vocabulary

<u>Word:</u>	Brief definition.
tower	a structure that is much taller than it is wide
dome	a vaulted structure that generally has a circle for a base and a roof shaped like half a ball (or a sphere)

Materials

- newspaper
- tape
- ruler
- sugar cubes (or blocks)

In the Classroom**Introductory Discussion**

1. Review what the class has covered over the past two weeks.
 - Over the last two weeks, we’ve been learning about structures. Who remembers what a “structure” is? (answer: any supporting framework that is built to hold a load or enclose a “space”)



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- We took a walk around the neighbourhood and spotted all kinds of different structures. Who remembers some of the structures we found? (possible answers: houses, the school, bird nests, spider webs, etc.)
 - Last week we learned about different kind of fasteners, different ways we can hold material together to build structures.
 - Well, today we are going to use what we know about structures and fasteners and start building!
2. Short description of other items to discuss or review.
- Towers are really tall buildings. When you go downtown, you can see a lot of really tall buildings, or towers. Harbour Centre, the Space Needle and the CN Tower and the Eiffel Tower are all examples of towers.
 - Domes are vaulted structures that generally have a circle for a base and a roof shaped like half a ball (or a sphere) – like BC Place. The Science World Telesphere is a special kind of dome known as a “geodesic dome.”
3. Briefly describe science experiment/activity.
- Today, we are going to build our very own towers. We are going to build towers using newspaper and tape. We are going to experiment to try to make the tower both tall and strong.
 - Once we have all built our towers, we are going to see which one is the tallest without falling over!
4. Experimenting and recording observations are important parts of science. Like last week, today we will be recording our observations on a worksheet. As well, you will be experimenting as you build to determine what things make your tower stable.

Science Activities

Activity Title: Building Towers

Purpose of Activity: To build the tallest tower you can build with newspapers and tape.

Methods and Instructions:

Set-up prior to experiment: Gather newspapers and tape.

Brief description of how students will work in groups or pairs.

1. Students are instructed to build the tallest tower they can build (that doesn't fall over) using newspapers and tape.
2. Students are told that they can bend, fold, roll, crumple or tear the newspaper.
3. Students will use the ruler to measure how tall their tower is. They will continue to try to make the tower taller.
4. Students will draw a picture of the tower hat they built and record the height of the tower (in cm) on the attached worksheet.

Closure Discussion

1. What did you learn about building towers?
2. What things did you do to make your tower taller?



Image References

1. Source of image on the worksheet: http://classroomclipart.com/cgi-bin/kids/imageFolio.cgi?action=view&link=Clipart/Architecture&image=effile-tower_17.jpg&img=24&search=build&cat=all&tt=&bool=and Allowed for educational use grades K-12, in print or on the web

References

1. <<http://www.kidsfitnesscentral.com/sugar-cube-igloos-crafting-with-food/>> Sugar cube igloos – Craft from food. []Instructions for being a dome out of sugar cubes. Accessed 3 May 2009.

Extension of Lesson Plan

Activity Title: Building Domes

Purpose of Activity: To build a dome with sugar cubes (or blocks).

Methods and Instructions:

Set-up prior to experiment: Gather sugar cubes (or blocks)

1. Students will build a dome using sugar cubes (or blocks).
2. First, arrange cubes/blocks in a circle (about 7 inches across is a good size), which will serve as a base for the dome.
3. Next, arrange the next layer of cubes/blocks so that they are slightly closer to the centre of the circle (i.e., a slightly smaller circle); make sure to stagger the cubes/blocks (like bricks are staggered in a wall)
4. Continue to build new layers, each a slightly smaller circle than the previous one, until the dome is complete.

Note: frosting can be used like mortar to hold the sugar cubes together, if you are using sugar cubes to build your dome.



Tower Worksheet

Name: _____ Date: _____

Draw a picture of the tower that you built:

My tower was _____ cm tall.