

SCIENCE | TECHNOLOGY | ENGINEERING | MATH

This special Newspaper In Education feature is brought to you by the St. Louis American Foundation, the Missouri Press Foundation and this newspaper.

Growing future scientists, technologists, engineers, and mathematicians with the newspaper!

What Is Topology?

Topology is a type of mathematics that covers distorted shapes. In topology, objects or shapes that are distorted or changed in shape will still have the same properties, such as volume. In the eyes of topologists, two items are the same if they can be distorted without being torn or cut.

If you have soft clay (or play dough), you can observe the theory of topology. You can twist, stretch, bend, and mold the clay to create different



shapes. No matter what size or shape you create, your clay will weigh the same. You will still have the same amount of clay. You can also use a rubber band to observe the theory of topology. You can create the figure eight with a rubber band, or create an oblong shape.

For more information: <http://2000clicks.com/MathHelp/BasicSetTopologyKidsIntro.aspx>
<http://britton.disted.camosun.bc.ca/totopology1.htm>

Learning Standards: I can read nonfiction text to gain background information about a mathematical topic. CCS.ELA-LiteracyCCRA.R.2, CCS.ELA-LiteracyCCRA.L.6



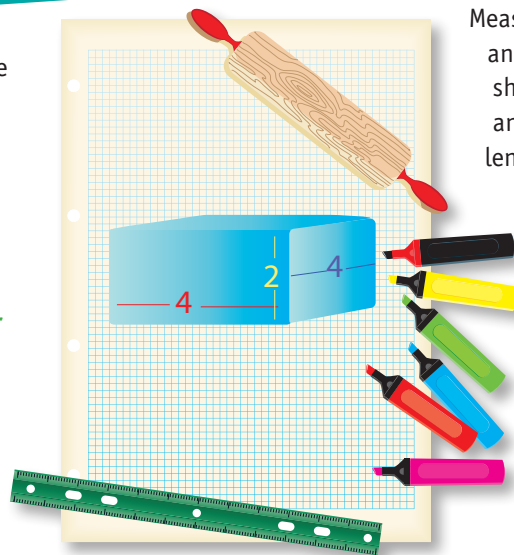
Become A Mad Scientist!

In this experiment, you will investigate topology. Topology is the theory that changing shapes of an object does not change the volume. Remember, to calculate volume, you will multiply length, width, and height.

Materials Needed:

- Modeling Clay • Ruler • Graph Paper
- Permanent Markers in 3 Colors
- Rolling Pin

Procedure: Form the modeling clay into a square or rectangular shape. Mark the sides with the permanent markers, using different colors for length, width and height. Use the ruler to measure the length, width and height, and record the results. Use the rolling pin to flatten the shape. Keep



the edges square while changing the shape of the clay. Measure length, width and height again and record. Continue flattening the shape while keeping the edges square and stopping to measure and record the length, width and height of the object.

Try to get at least 10 examples. Calculate the volume of each recorded shape by multiplying the length, width and height. Compare the results. The volume should be the same for all shapes.

Evaluate: What did you observe as you changed the shape? Did the volume change or stay the same? What did this experiment teach you about topology?

Learning Standards: I can follow step-by-step directions to complete an experiment. I can analyze and record the results. CCS.ELA-LiteracyCCRA.R.1

Check This Out!

The name of the popular search engine "Google" came from a misspelling of the word "googol," which is a very, very large number (the number one followed by 100 zeros).

1000000000 0000000000 0000000000 0000000000 0000000000 0000000000 0000000000 0000000000 0000000000 0000000000

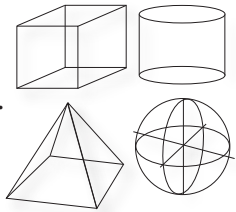
Extra! Read All About It!

Use the newspaper to complete the following activities:

Shape Attributes

Identify 2-dimensional shapes (circle, rectangle, rhombus, trapezoid, and triangle).

Cut them out of the newspaper, then paste them into a chart according to their attributes. Do the same with 3-dimensional shapes (rectangular prism, cylinder, pyramid, and sphere).



Polygon Perimeters

Circle four verbs in a news story. Use a ruler to connect the verbs like a dot-to-dot puzzle to form a polygon. Measure and label each side of your polygon with an inch ruler. Add the lengths of the sides to find the perimeter. Write the perimeter in the center of your polygon. Try it again with nouns or adjectives.

Learning Standards: I can use the newspaper to locate, describe, and create geometric shapes and properties. CCSS.ELA-LiteracyCCRA.W.4, CCS.ELA-LiteracyCCRA.R.2

Go Figure!

To calculate the area of a rectangle, you will multiply length times width. Use the formula to solve the following problems.

$$\text{Length} \times \text{Width} = \text{Area}$$

- If the length of a rectangle is 7 yards, and the area is 42 square yards, what is the width? _____
- If the width of a rectangle is 8 meters, and the area is 96 square meters, what is the length? _____
- If the width of a triangle is 9 feet, and the height is 6 feet, what is the area? _____
- If the area of a triangle is 48 square yards, and the length is 8 yards, what is the width? _____

Learning Standards: I can add, subtract, multiply, and divide to solve a problem. CCSS.MathContent.3.OA.A3

