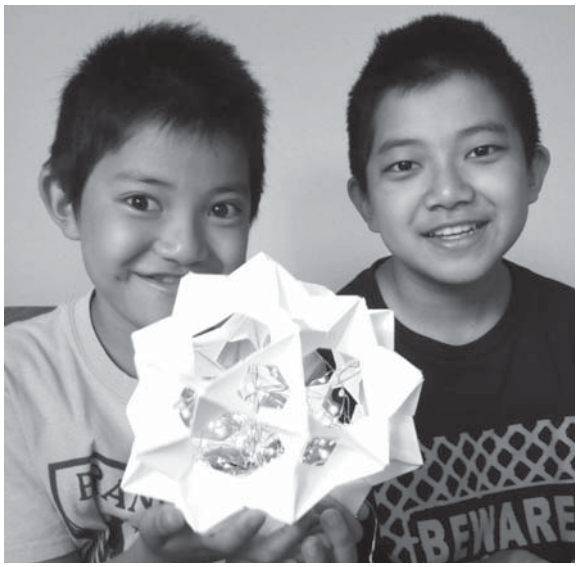
Origami Math

Masako Inoue

BEFORE YOU READ:

1. Share what you know about origami. How do you think math could be involved?

2. Describe what we mean by two-dimensional and three-dimensional.



Masako Inoue's sons and the origami lamp that they made.

Hands-On Learning

Origami is a beautiful Japanese art form that involves folding and cutting paper into different shapes. It is also a great way to teach math. In Japan, many math teachers show children how to fold paper in certain ways so that they can learn math concepts.

When children are learning about shapes in school, their teacher will demonstrate how to fold paper to make the shapes. This brings the concept to life. Young children can fold a square piece of paper into a triangle, a diamond, or even a three-dimensional cube. Making a simple box with a piece of paper is a great way to learn about geometry.

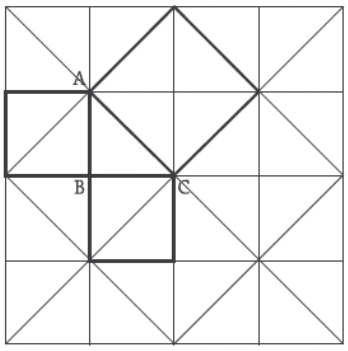
Illustrate the Pythagorean Theorem!

You can also cut origami to illustrate the Pythagorean Theorem. This theorem says that the area of squares created from the two shortest sides of a right triangle are equal to the area of a square created from the longest side. Mathematically, the theorem is written like this: $a^2 + b^2 = c^2$. In the image below, you can see how those squares are created and the theorem is illustrated.

Figure Out Patterns

Origami is also useful in architecture and engineering. Paper models can give a visual representation of symmetry, structure, and design. Students learn more about shapes when they see a design move freely back and forth between three-

Use origami to make a box like this one. You will find all the easy-to-follow steps for how to do it here: <www.wikihow.com/Fold-a-Paper-Box>.



Go to <www.teachersofindia.org/sites/default/files/11_paper_folding.pdf> and find out how to make an origami boat, which, when you unfold it (as you see in this picture), illustrates the Pythagorean Theorem!

dimensional and two-dimensional (a flat piece of paper). Some designs come from patterns repeating themselves. For example, the image of the origami lamp is made from thirty simple forms of paper all stuck together.

Many Japanese elementary school children learn how to make a crane with a piece of square paper. Once they understand the pattern for a crane, it makes it easier to make other new objects. Math is like that, too. You have to master certain patterns and then you can build off of them and make more complex patterns.

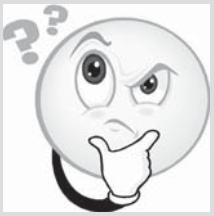
To sum it all up, origami is not just a piece of paper folded or cut into a shape. Origami also has many educational benefits. Just think about how much math you can learn by doing origami!

AFTER YOU READ:

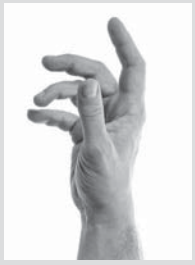
1. Visit origamiway.com, wikihow.com, and/or youtube.com to learn how to make origami. Write out the steps. Use your own words to teach your classmates.

2. Are there other ways you could use folded paper to learn about math concepts? For example, how could you use folded paper to learn about fractions? Try this activity: <www.youcubed.org/tasks/paper-folding>

Sources: <www.ted.com/talks/robert_lang_folds_way_new_origami>; <theconversation.com/origami-mathematics-increasing-33968>



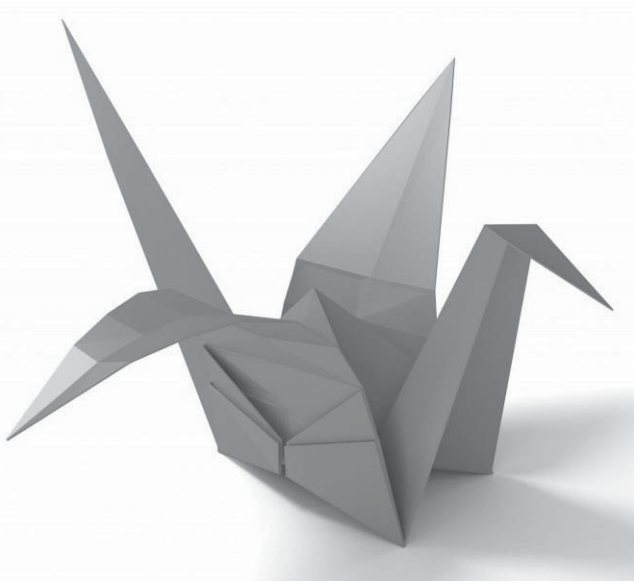
Math Strategy:
Use manipulatives!



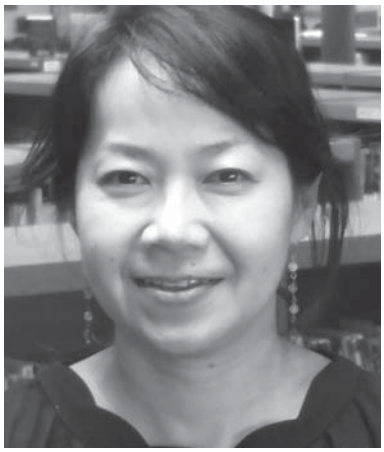
Manipulative (n):

A manipulative is something you can touch and move with your hands. It comes from the Latin for hand, which is "manus." (Think of "mano" in Spanish and "main" in French.)

Manipulative is also an adjective. When we use this word to describe a person, it has a different meaning.



Learn how to make an origami crane (like the one above) and lots of other things at <www.origamiway.com>.



Masako Inoue is from Japan and has lived in the United States since 2013. She is currently a student at the East Shore Region Adult and Continuing Education program in Branford, CT. While here, she has enjoyed teaching others about her culture, language and especially about Japanese food. Her two boys love to fold origami.