LESSON 7: RE-USE OF PAPER

Activities

Activity 1: Fold a Magazine Cover Box

Activity 2: Fold a Spiky Star

Models for this lesson:

Magazine Cover Box, Spiky Star

Materials needed:

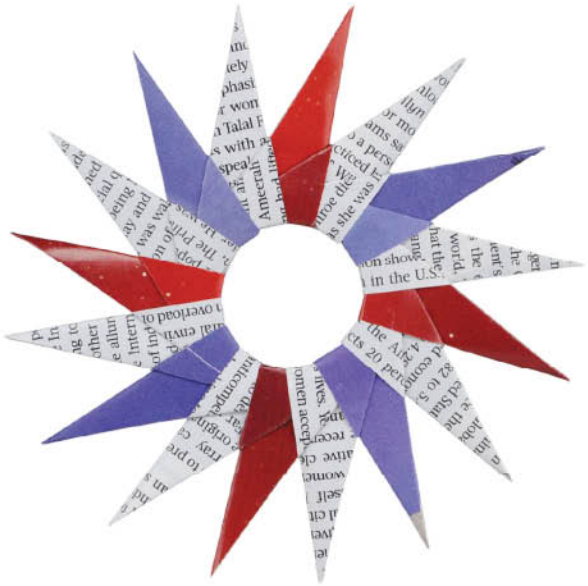
Square paper, rectangular paper

Targeted grade levels:

Grades 1 and above

Teaching Tips and Techniques:

- Investigate the patterns inside business envelopes.
- Try folding the model several times before the lesson. You should be familiar with all the steps before teaching others.
- Display or use the folded models in the classroom.



Lesson Introduction

Welcome to Lesson 7! First of all, we would like to thank everyone for being with us for one year. Whether you have mastered all the bases we have covered or not, we are super excited for the upcoming second year where we will cover models for which one may not need to know the traditional bases.

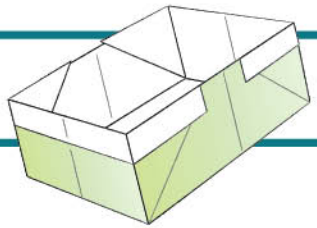
This year we will show you how to utilize Origami lessons to enhance other subjects, such as social studies, art, and even physics. We will still cover the math exercises with each of these lessons because the benefits of incorporating Origami in math are numerous.

Our first lesson of this second year is about the "re"-use of paper. We all come across so many brochures, flyers, index cards, magazines, giftwrap, and other beautiful printer paper that is usually discarded. In Origami these castaways have the potential to become unique pieces of art. When looking for materials for Origami, why not consider experimenting with some non-traditional ones like napkins, paper bags, and memo cube paper. You can make your own duo paper by taking two interesting pieces of paper and gluing them back to back. Use colorful tissue paper to brighten up a recycled letter.

Folding models from found paper is a great way to enrich a class or discussion on recycling by demonstrating how one person's used piece of paper or magazine can become a useful box, a colorful decoration, or a beautiful flower. Have the students examine different papers and discuss the qualities of paper - thickness, durability, texture, and suitability of folding.

Have a "found paper" party or contest in class. Have every child bring in a piece of paper and tell a story about how and where they found it and why it is significant.

The Magazine Cover Box in Issue 7 was made from an advertisement in Time Magazine trimmed to a rectangle. The Spiky Star was made from squares cut from pages from Time Magazine.



ACTIVITY 1 - *Fold a Magazine Cover Box*

Because it can be difficult for some students to see the crease landmarks on printed paper (for example, a magazine cover), you might consider using paper with one unprinted side. Making two of these boxes will allow you to use one for a lid. For an easier fit, don't fold all the way to the center crease in steps 2 and 4 when making the second box.

1. What is the area of the new rectangles? Can you prove it mathematically?

2. What is the area of the new rectangles? How do these rectangles relate to those made in step 1?

3. How many rectangles are there now? What is the area of the 8 rectangles?

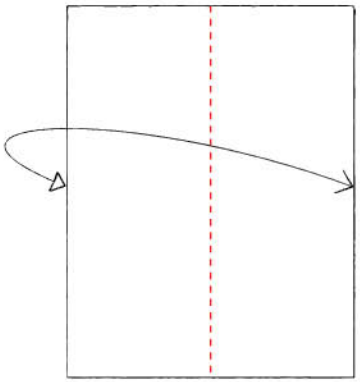
4. How many rectangles are there now?

5. What is the angle the crease makes with the top and bottom edge of the model?

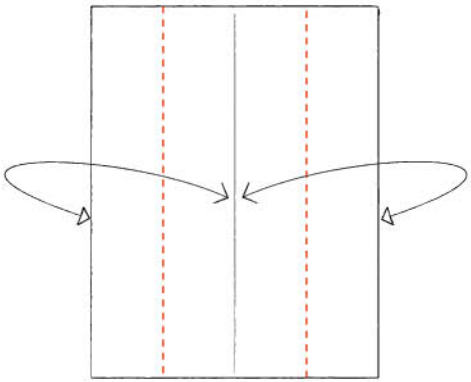
6. If you are using duo paper, note the color change.

7. Measure the length, width, and depth of the finished box. Can you figure out the volume? Make the box with different sizes of paper. Will the volume increase or decrease with the different sizes of paper? Can you make this model with all rectangles?

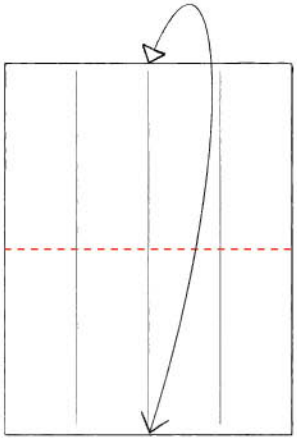
MAGAZINE COVER BOX



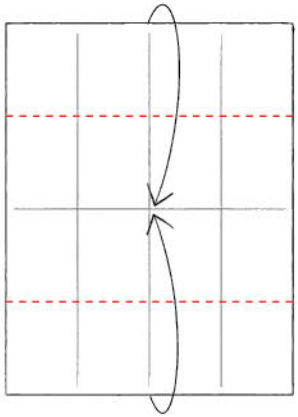
1 Fold left long edge over to right long edge and unfold.



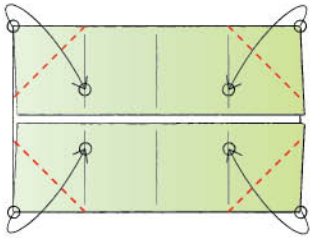
2 Fold left long edge in to the center crease and unfold. Repeat with the right long edge.



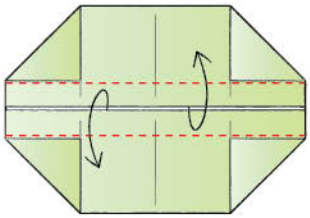
3 Fold top edge down to bottom edge and unfold.



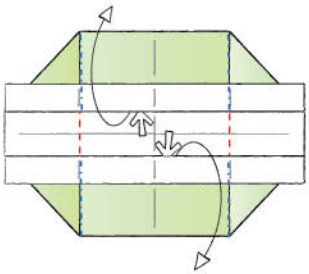
4 Fold top edge down to center crease. Fold bottom edge to center crease.



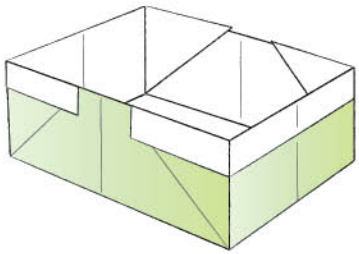
5 At all 4 corners fold the bottom edge to lie on the nearest vertical crease.



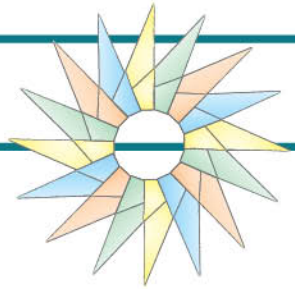
6 Fold the long edges over the triangles created in step 5.



7 Gently pull up the long sides of the model. Reinforce the corner and bottom creases to shape the box.



Finished Magazine Cover Box!



ACTIVITY 2 - *Fold a Spiky Star*

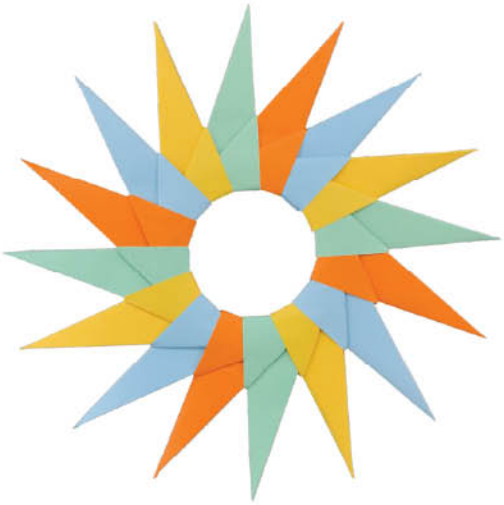
This model is an example of modular Origami - a model made of more than one piece of paper. You can use all one color of paper or mix up paper colors. Use this model as a group activity with students each folding a unit to make one star. Have students figure out how many units each must make to create the desired number of completed Stars. You can cut squares to any size. Younger students should start with 6-inch squares.

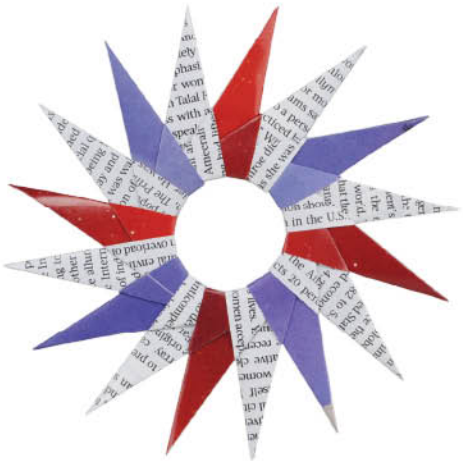
1. Identify the squares and the rectangles. How many of each is there?

2. Do you remember the name of this base? It's the Blintz base from Lesson 2.

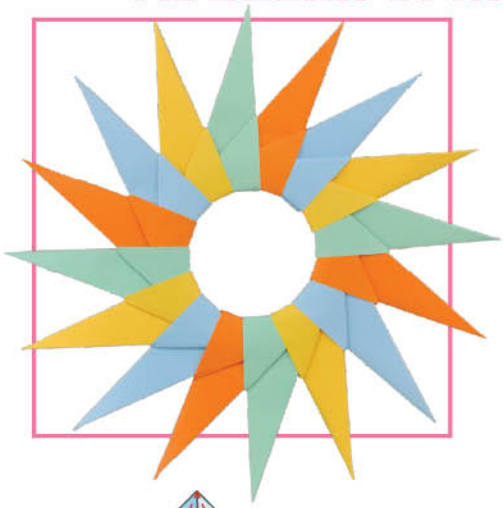
3. Explore the symmetry of the model. What shape is this?

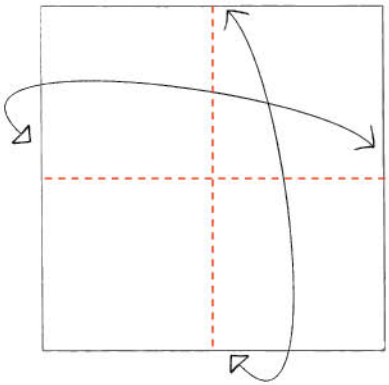
You will need to make 13 - 16 identical units. The more units you assemble, the more stable the model will be. You can use a little glue as you put the units together, being careful to keep the center circular. Or put a little invisible tape on the back to help hold the Star's shape. You definitely must use glue or tape if you wish to hang the Star.



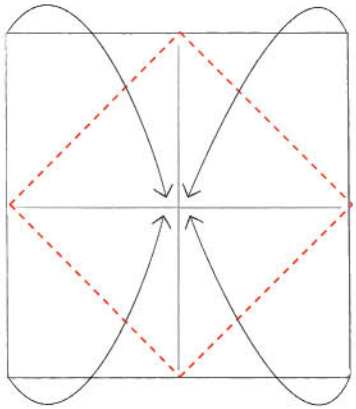


MODULAR SPIKY STAR

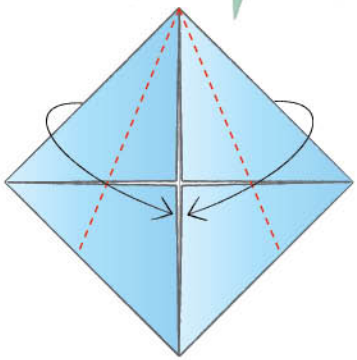




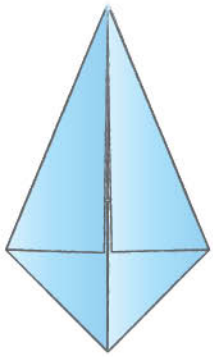
1 Starting with white side up, fold in half and unfold. Fold in half the other way and unfold.



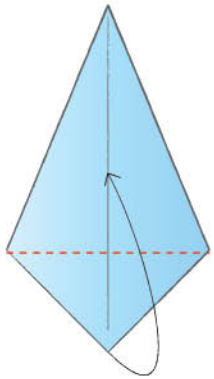
2 Fold each corner point in to the center.



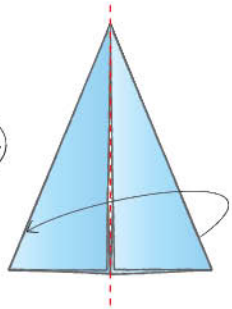
3 Fold the upper right edge in to the center crease. Repeat on the left.



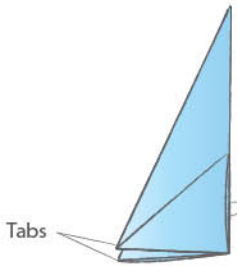
4 Turn over.



5 Fold bottom tip up as shown. Turn over.

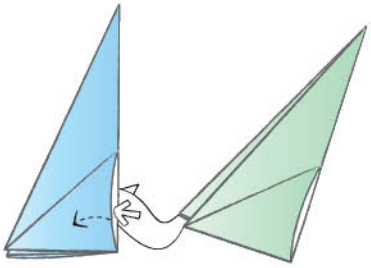


6 Fold in half.

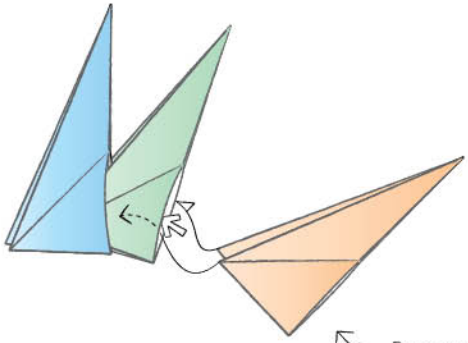


Make 13-16 units.

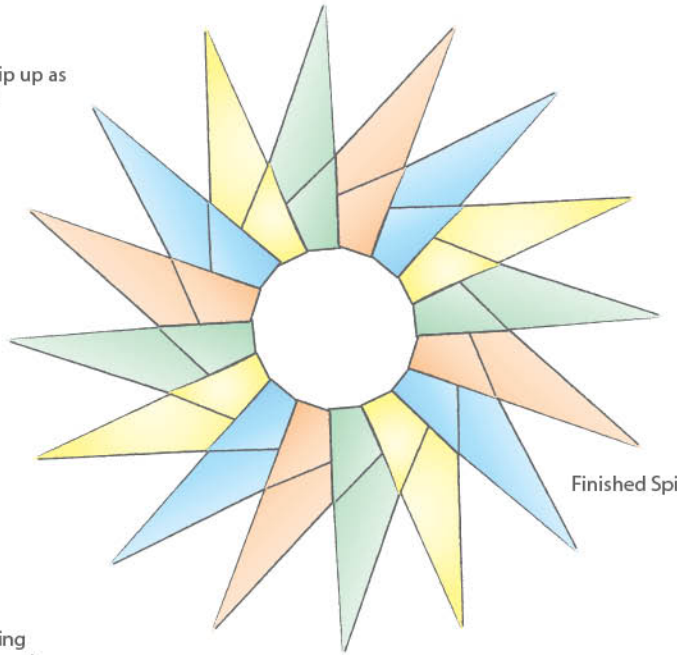
ASSEMBLY



Insert tabs of second unit into pockets of first unit. Continue inserting tabs into pockets.



Repeat using remaining units.



Finished Spiky Star!