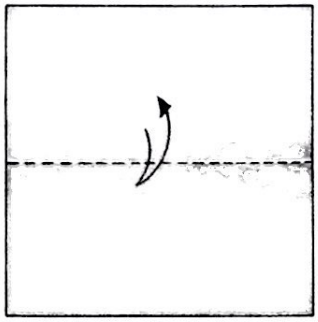
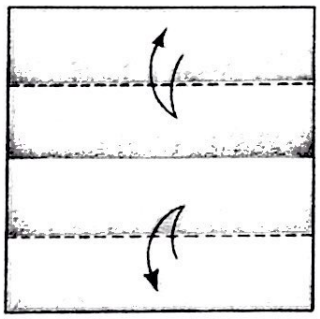
1 Start with the white side of the paper facing up. Fold the paper into two congruent rectangles and unfold.



What can you say about the area of each small rectangle compared to the area of the square?

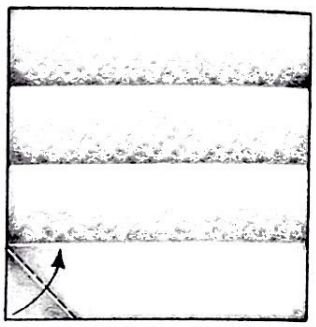
2 Fold each small rectangle in half lengthwise and unfold.



a. *What is the area of each of the smallest rectangles compared to the area of the square?*

b. *Describe the relationship among the three folded lines on your paper.*

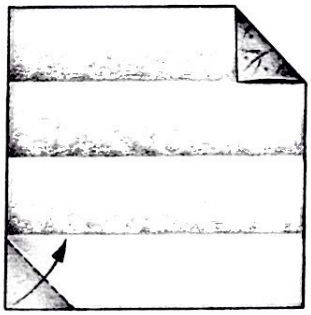
3 Fold the lower corner up.



a. *What kind of triangle have you folded?*

b. *What are the measures of its angles?*

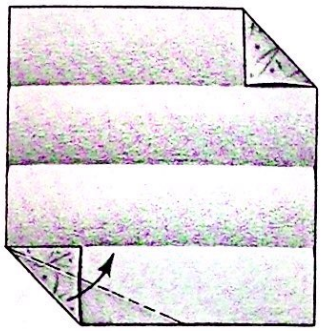
4 Rotate the paper 180° and repeat step 3.



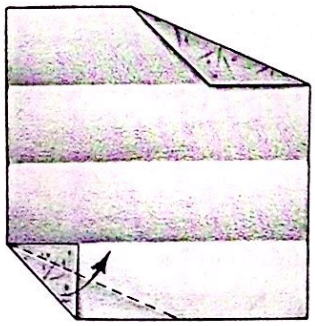
a. *What is the name of the six-sided polygon you have made? Is it a regular polygon? Why or why not?*

b. *Put your finger on the center point of the paper and rotate the figure 180°. Explain why you can say that this figure has 180° rotational symmetry.*

5 Fold to bisect the 45° angle as shown. This fold is known as the "paper airplane" fold. Be sure to keep the vertex point as sharp as possible.



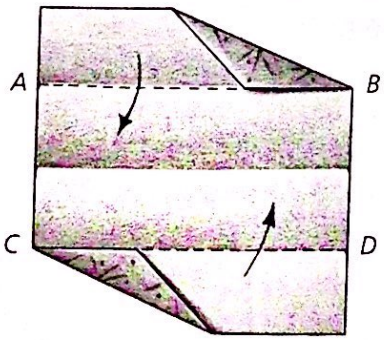
6 Rotate the paper 180° and repeat step 5.



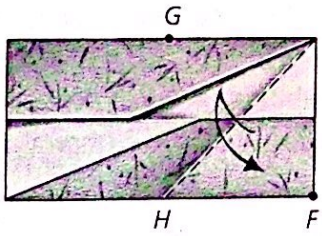
a. *What kind of triangle is this final folded triangle?*

b. *What are the measures of its angles?*

7 Refold along the existing parallel line segments *AB* and *CD*.



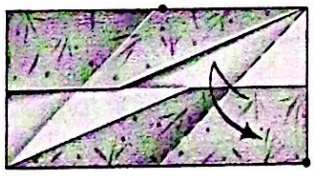
8 Starting from the lower right-hand corner, fold a large isosceles triangle so that point *F* lies on point *G* and point *H* is a vertex.



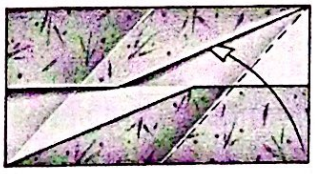
a. *Look for the two congruent triangles in the diagram above. What kind of triangles are these?*

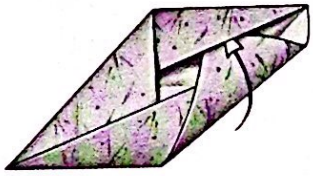
b. *What kind of polygons are the two congruent patterned figures?*

9 Rotate the paper 180° and repeat step 8.

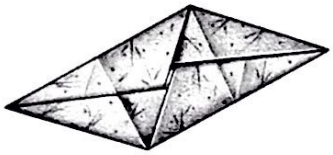


10 Tuck each flap into a pocket, making sure the corners lie flat when inserted.





11 The star-building unit is now complete. Your figure should now look like the one below. The size of the white space on your unit, as shown in the picture below, reveals how accurate your folds have been. A small white space won't make much difference, but a gaping hole might.

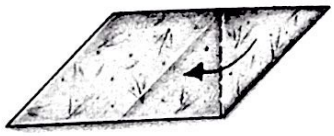


12 Here's how to fold the unit for easy storage. Turn the figure over.

a. *Name the quadrilateral formed.*

b. *What are the measures of the angles of this quadrilateral?*

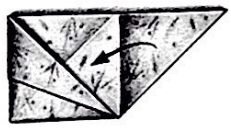
13 Fold the top right acute angle so that its vertex lies on top of the top left obtuse angle.



a. *What kind of triangle is formed by your fold?*

b. *What can you say about the area of the triangle compared to the area of the quadrilateral?*

14 Rotate the figure 180° and repeat step 13.



15 Leave the unit in its square shape, and put it in a safe place.

How does the area of the final square compare to the area of the quadrilateral in step 12?

Remember to answer each of the folding questions in your origami journal and save your completed star-building units for the next activity.