

CHAPTER
4 **Project**
Flexible Creations

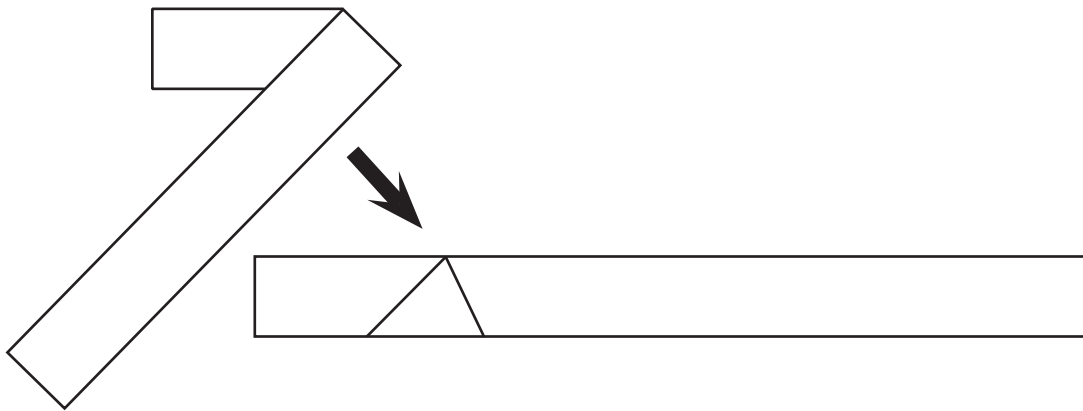
Activity 1: Strips of Triangles *Use after Lesson 4-1*

Beginning with a long strip of paper, you can make a series of folds that result in a row of triangles with an interesting property.

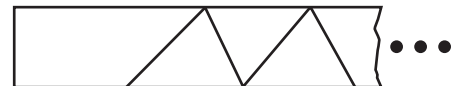
1. Cut out a long strip of paper with parallel edges. Fold the paper at any angle. Then unfold it to create a transversal.



2. Bisect the obtuse angle that was formed by folding the paper so that one edge lines up with the crease from the first fold. Then unfold the paper.



3. Continue to fold the strip in this way, alternately folding upward and downward to create a long row of triangles.



4. What do you notice about the triangles as you continue to fold the strip?

5. Aside from the first few triangles, what type of triangles did you create? Classify them by their side lengths and angle measures.

6. Does this work for any strip of paper and any initial fold? Repeat the activity with a strip of paper that has a different width and make an initial fold at a different angle. What happens this time?

CHAPTER **Project**
4 **Flexible Creations** continued

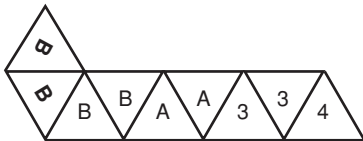
Activity 2: Making a Flexagon *Use after Lesson 4-3*

Flexagons were discovered in 1939 when a university student named Arthur Stone was playing with a strip of paper trimmed from a notebook. As you will see, a *flexagon* is a polygon made from folded paper that reveals different faces when it is “flexed.”

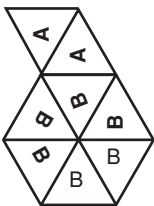
1. Use the method from Activity 1 to make a strip of paper that is divided into ten equilateral triangles. Check that the triangles are all congruent to each other. (*Hint: The first few triangles in the strip probably won't be equilateral. Make the strip extra long, and then cut off everything except the ten congruent triangles at the end of the strip.*)
2. Label the front and back of the strip as shown.



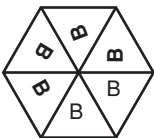
3. Fold the strip so that the triangles labeled 1 face each other.



4. Fold the strip so that the triangles labeled 2 face each other.



5. Fold the strip so that the triangles labeled 3 face each other. Carefully glue together the triangles labeled 4 and let the glue dry.



6. Now you are ready to flex your flexagon! Pinch together two of the triangles and push in the opposite side so that the flexagon looks like a Y when viewed from above. Then open your flexagon from the center. Repeat, pinching together a different pair of triangles.
7. How were the two sides of the flexagon labeled before you flexed it the first time? How were they labeled after you flexed it?

8. How many different front-back combinations are possible? _____