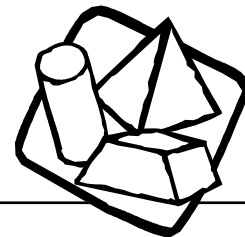


Mon-Kiri



Cut and compare paper patterns that you make yourself.

What you need

Paper circles

Scissors

What to do

1. Fold the circle in half.
2. Make a triangle cut along the fold.
3. Make a second cut along the fold in the shape of a square.
4. Make a third cut in the shape of a half-circle.
5. Make similar cuts on the non-folded edges.
6. Open it up and look at it. What happened to the shapes?
7. Get a new circle and fold it in half twice.
8. Make the same cuts as before (triangle, square, and half-circle) along each of the folded sides and along the unfolded edge.
9. Open it up and look at the cuts. What happened to them?
10. Compare the two circles. What is similar? What is different?
11. Get a new circle and make your own folds and cuts. What kind of pattern can you make?

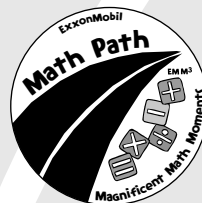
What to ask

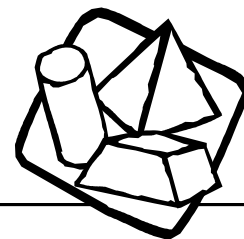
- What would happen if you folded the paper three times and then cut it? Five times?
- How do you figure out how to make the design that you want?
- How many lines of symmetry are there in your design?
- Can you make another design with even more lines of symmetry?



Did you know?

The Japanese art of paper cutting, Mon-Kiri, was sometimes used to cut out family emblems in ancient Japan. Recognizing symmetry helps us to appreciate and understand art including paintings, sculpture and buildings. Folding and cutting helps kids see that what happens to one part that they can see also happens to the other parts in a predictable way.





What's next?

- Draw a design. Decide how to fold and cut to match your drawing.
- Brainstorm all the possible shapes that could be cut out. (i.e. what are all the symmetrical shapes?)
- Try starting with a square piece of paper rather than a circle.

To learn more

Visions of Symmetry by MC Escher

by Doris S. Schlattscheider

This famous artist, who considered himself a mathematician, used symmetrical features of objects to create many of his unusual drawings and painting.

Mathematical Window Patterns: Art of Paper Geometry

by William Gibbs

Learn how to cut fun geometrical patterns and learn about symmetry geometry and repeating patterns.

The Geometry Center

www.geom.umn.edu

This website devoted to geometry allows access to a program called Kalideo Tile that you can download for free!

How it helps with school

Texas Essential Knowledge and Skills (TEKS) Standards

Geometry and Spatial Reasoning: 3.8, 3.9B-C; 4.8C, 4.9C

Underlying Processes and Mathematical Tools: 3.15D, 3.16A; 4.14D, 4.15A; 5.14D, 5.15A

National Council of Teachers of Mathematics (NCTM) Standards

Geometry, Connections, Representations