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IDEA: MOBIUS STRIP DISCOVERY

FOR AGES: 5-15, or as developmentally appropriate

ESTIMATED TIME: 1-2 hours

STEM AREA: MATHEMATICS This 3-dimensional shape is interesting because it seems to be only one sided. This shape is used in magic as well as math!

CAREER OPTIONS: Mathematician, Engineer, Computer and Information Research Scientist, Computer Systems Analyst, Statistician

INSTRUCTIONS:

ITEMS NEEDED: Paper
Pencil
Scissors
Ruler
Clear scotch tape

PROCEDURE: 1. Cut paper into a long strip $\frac{1}{2}$ inches wide and 11 inches long.



2. Hold the strip of paper between your thumb and pointer finger with both pointer fingers facing up to the ceiling. Turn your finger on your right hand so your pointer finger is now facing down to the floor. This will put a 180° twist in the strip of paper.



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The logo consists of four interlocking puzzle pieces arranged horizontally. From left to right, they are red with a white 'S', blue with a white 'T', green with a white 'E', and orange with a white 'M'.

3. Connect the ends of the paper with tape. Your Mobius strip should look like this:



4. Without picking up the tip of the pencil, draw a line through the center of the strip. Even though the paper has two sides, you can trace through the center of the whole thing without lifting the tip of your pencil!



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5. Carefully, using the scissors, cut along the line you just drew in pencil. When you reach the moment before it is cut all the way, pause and decide if you think the Mobius strip will cut into two pieces or one large piece...



6. Now cut all the way to the end of your traced line...



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OTHER OPTIONS: Try this same thing with a double Mobius strip. To make this, twist one end of the paper 360° and tape it together. Your double Mobius strip should look like this:



After tracing the line through the middle of the strip and cutting along the line, it will look like this:



MORE MATHEMATICS IF YOU LIKE THIS:

- Try making other shapes, such as cubes or pyramids, out of paper.
 - Use other materials to make the same shapes or different ones
- 3D design an object using a free website or software and 3D print it!