

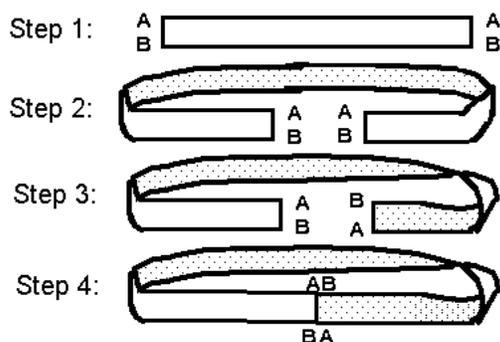
The Möbius Strip

History

The Möbius strip is an abstract geometric surface with only one side and one boundary - a rather interesting property considering the more familiar open cylinder which has two sides and two boundaries. The surface of a Möbius strip is *non-orientable* meaning that left-right relationships can become swapped by traversing the surface. It was discovered by and named after the German mathematician August Ferdinand Möbius in the 19th century.

Assembly

From a plain sheet of paper, cut a strip with a length to width ratio anywhere from 10:1 to 10:6. Follow steps 1 through 4 below, joining the ends of the strip with tape or glue stick after a half-twist.



Finished Assembly

Exploring the Möbius Strip

1. Using a marker, mark an "X" anywhere in the middle of the strip. Without lifting the marker, and starting from the X, draw a line down the center of the surface and parallel to the edge. Where does the line finish? Examine the surface and the line you drew. Is there any part of the surface that does not contain the line? From this result what conclusion can you make regarding the number of surfaces?
2. Repeat the same experiment as above, but this time starting on and marking an edge (boundary). From this result what conclusion can you make regarding the number of boundaries?
3. From experiment 1 above, and using scissors, cut along the line that was drawn. One would expect the Möbius strip to be cut into two loops. What actually happens?
4. Make another Möbius strip. Cut the strip as in experiment 3, but this time parallel to but 1/3
5. For contrast, you can repeat the same set of experiments above on a simple open cylinder. Create the cylinder surface by skipping the half twist in step 3 in the assembly above (A meets A and B meets B)

Learning More

Pickover, Clifford [The Möbius Strip; Dr. August Möbius's Marvelous Band in Mathematics, Games, Literature, Art, Technology, and Cosmology](#), Thunder's Mouth Press, New York 2006