Möbius Strip Encyclopedia Article

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Möbius Strip

A Möbius strip is constructed by twisting one end of a rectangular strip of paper by 180 degrees (a half twist) and joining it to the other end. The result is an example of a one-sided surface. If you draw a line along the surface starting at a point A, you will pass through the point that was on the opposite side of A before the strip was twisted, and will then return to the original point A, all without ever lifting the writing instrument from the paper. In other words, it is possible to paint the entire surface with a continuous sweep of a brush. Furthermore, while an ordinary strip has two edges, a Möbius strip has only one edge. The Möbius strip was named for August Ferdinand Möbius (1790-1868), a German mathematician and astronomer, who discovered it in 1858 while studying the properties of one-sided surfaces. At almost the same time another German mathematician, Johann B. Listing (1806-1882), discovered the surface and published the first description in his book on topological investigations.

The Möbius strip has several interesting properties that makes it a favorite for mathematical demonstrations. If the surface is cut down the middle lengthwise, the result is still a single strip (though no longer a Möbius strip) that is now twice as long and half as wide, but with a double twist. However, slicing this new strip will now produce two pieces of the same length linked together like an old-fashioned linked chain. These properties play a crucial role in a short story written by William Hazlett Upson in 1949 called *Paul Bunyan versus the Conveyor Belt*. The Möbius strip has also been a favorite inspiration for artists. Maurits C. Escher (1898-1972) created three drawings based on the Möbius strip. The second, done in 1963, depicts giant ants climbing their way up one part of a Möbius strip ladder, only to find themselves descending again in an endless cycle.