Möbius Strips
Bizarre shapes and strange connections make math interesting, and nothing is more strangely fascinating than the simplicity and topology of the Mobius strip. The nineteenth-century German mathematician A. F. Möbius discovered that it was possible to make a surface that has only one side and one edge. Although such an object seems impossible to imagine, making a Möbius strip is very simple: take a strip of ordinary paper and give one end a twist, then glue the two ends together. And there it is. If you begin drawing a line lengthwise down the strip, after one full revolution you will be at the point where you started—but on the opposite "side" of the strip! Drawing the line through another full revolution will find you back at the beginning. Möbius strips are fun to play.
If you cut a Möbius strip lengthwise down the center until you wind up back at the beginning, can you work out what will happen to the strip?

Answer
The strip will stay in one piece. It will be twice as long and have two complete twists.

If you cut a Mobius strip lengthwise into thirds, each one-third from an edge, can you work out what will happen to the strip?

Answer
The strip will break into two linked bands, one a Möbius strip of the same length and the other a band that is twice as long and has two complete twists.
MOBIUS CROSSED
This figure is made up of two closed loops: a Möbius strip and a cylindrical band. Can you work out what structure will be formed if you cut the figure along the red line?

Answer
You will get an, ordinary squared “ring”— two sides, two edges and no twists.
MOBIUS SLOTTED BAND
This strip passes through itself, as shown. Can you work out what will happen if you divide it along the red line?

Answer
The result is two bands---one with a right-hand twist, one with a left-hand twist.