Tube Illusion Geometry:
Circles in Square Tubes, Triangles in Cylinders

Cut out these shapes and surprise yourself and your friends. Geometry, Optics and Papercraft are combined with startling results.
Patterned templates make it easy.

1000 PlayThinks
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What will you see if you look through the hole of a cardboard tube such as the one in the illustration?
Of course, if you look into a round tube, you'd expect to see a round opening at the other end. What would you see if you look through the tube shown here? You might not guess that you would see a square opening. The curves you cut at the end give the illusion that the round tube has transformed into a square one.
Materials
A cardboard tube from the middle of a roll of paper towels. The pattern here assumes your tube is of the standard size in the U.S. which is 11 inches (28 cm.) long and 1.75 inches in diameter. If you don't have a tube of these dimensions, you can roll up a piece of paper 28 cm long by 13.8 cm wide plus a little for overlap. However, the tube from a paper towel roll will give better results because the ends will keep their curve even after being cut.

Steps
1. Cut out the rectangular piece from the template.
2. Wrap the pattern piece around the cardboard tube so that the top of the pattern lines up with the end of the tube and tape it in place.
3. Cut along the curved lines.
4. Look through the tube toward the end you just cut.
Look Through a Tube, See a Triangular Opening

Of course, if you look into a round tube, you'd expect to see a round opening at the other end. What would you see if you look through the tube shown here? You might not guess that you would see a triangular opening. The curves you cut at the end give the illusion that the round tube has transformed into a triangular one.
Materials
A cardboard roll from the middle of a roll of paper towels. The pattern here assumes you tube that is of the standard size in the U.S. which is 11 inches (28 cm.) long and 1.75 inches in diameter) If you don't have a tube of these dimensions, you can roll up a piece of paper 28 cm long by 13.8 cm wide plus a little for overlap. However, the tube from a paper towel roll will give better results because the ends will keep their curve even after being cut.

Steps
1. Cut out the rectangular piece from the template.
2. Wrap the pattern piece around the cardboard tube so that the top of the pattern lines up with the end of the tube and tape it in place.
3. Cut along the curved lines.
4. Look through the tube toward the end you just cut.