SCIENCE MAGIC

IMPOSSIBLE PAPER

⚠ WARNING

CHOKING HAZARD - Small parts
Not for Children under 3 years
Scissors contain functional sharp edges
Use only under adult supervision.

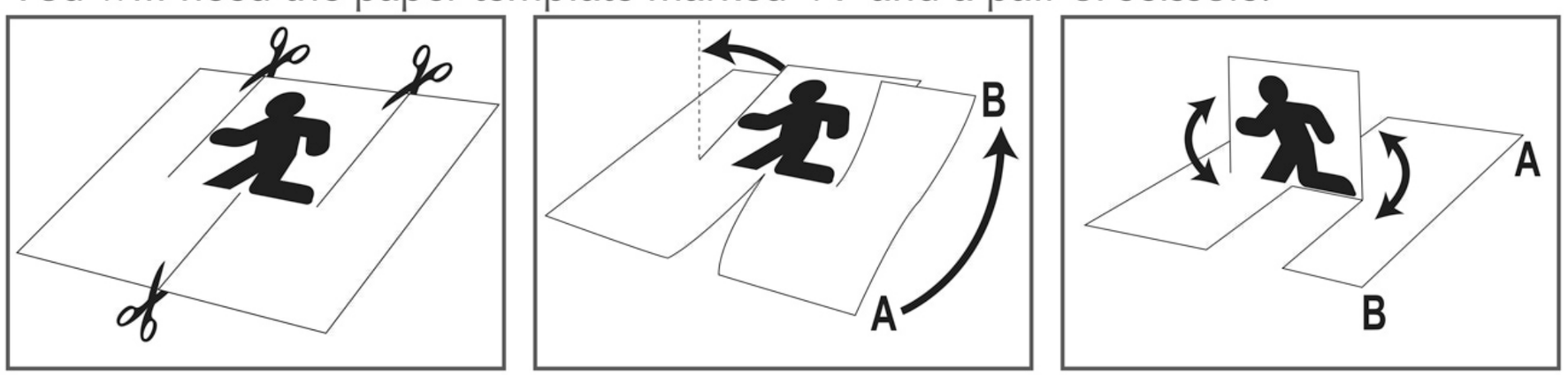
To Parents: Please read through these instructions before giving gudiance to your children.

SCAN IT! WATCH IT!

WATCH THE ONLINE VIDEO TO SEE THE MAGIC SECRET!

TRICK 1: MARVELOUS PAPER

You will need the paper template marked "A" and a pair of scissors.



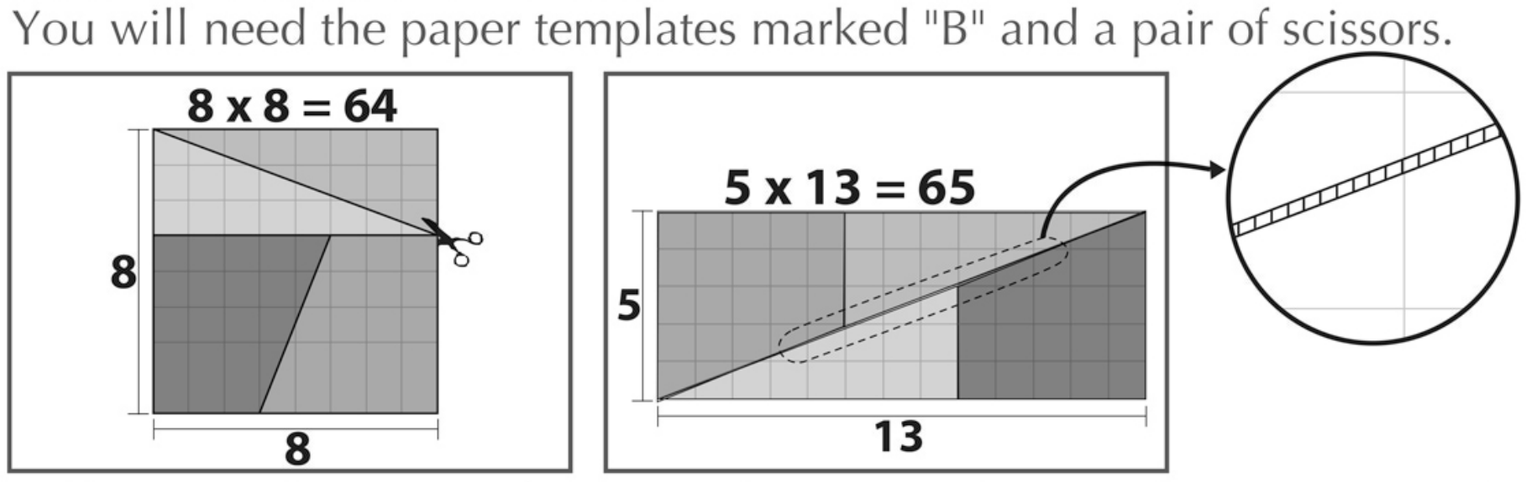
Show your audience the paper template. Tell them that this piece of paper is magical, as it can grow a new dimension from the flat surface. Do the following steps without them seeing you, e.g. under a table top. Cut along the black lines. Now, fold the central figure to make it upright. Next, hold one end of the cut paper and gently rotate the other half by 180°, so that it flips over. Then place it on the table. Do not let your audience touch it. Ask them how the extra dimension can appear like this. You have made an impossible paper sculpture!

HOW DOES IT WORK?

This is a simple trick to create an interesting illusion. The paper is originally 2 dimensional, but now another piece (the central figure) grows magically on the flat sheet. The paper has transformed to become "3D"!

TRICK 2: WEIRD PUZZLE

You will need the paper templates marked "B" and a pair of scissors.



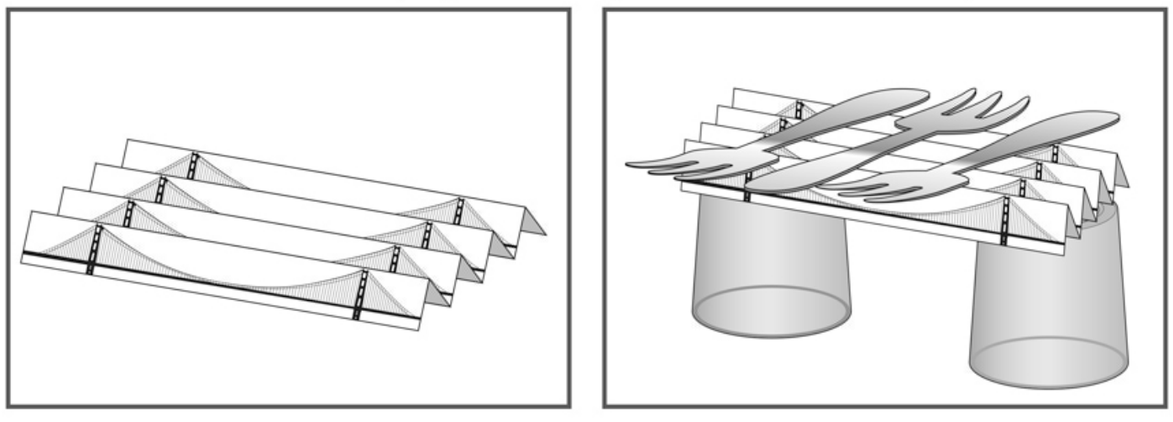
Tell your audience you have another piece of paper that can magically grow. Cut out the puzzle template "B" and show it to the audience. Ask a volunteer to count the squares on the paper. There are 8 x 8 = 64. Next, invite a volunteer to cut out the four shapes marked on the paper: I, II, III and IV. Now, rearrange the shapes according to the picture above right. Then ask the volunteer to again count squares. There are 5 x 13 = 65! Where does the extra square come from? It's magic!

HOW DOES IT WORK?

The original number of squares is 64. How is the extra square created? If you look closely at the rectangle that's formed, the shapes do not fit together snugly. The small area between the gaps is as large as the "extra" square unit.

TRICK 3: PAPER BRIDGE

You will need the paper template marked "C", 3 or 4 forks and two glasses of equal height.



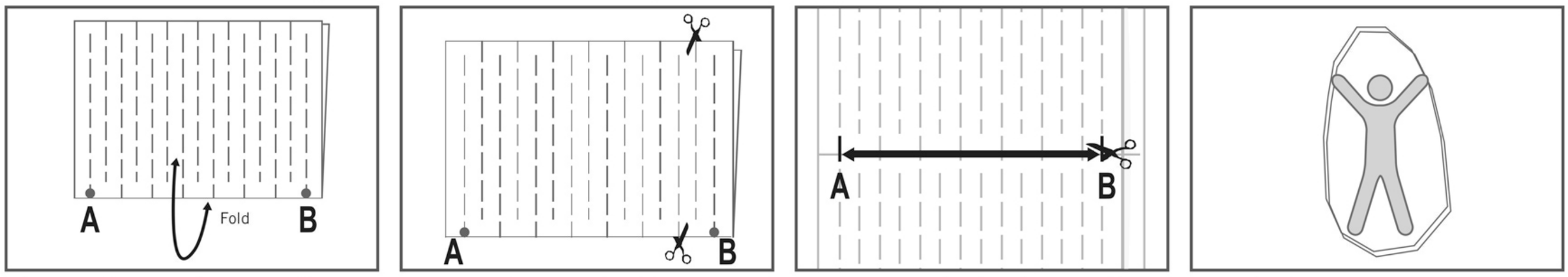
Put two glasses on the table, upside down. Show the audience the paper template. Challenge them to use the paper to build a "bridge" between the two glasses, which should be able to hold 3-4 forks. They will be puzzled. Now , demonstrate how to fold the paper along the dotted lines to make a folded paper structure. Then, put the bridge between the two glasses and place the forks on it. Bravo! You have built a magical paper bridge!

HOW DOES IT WORK?

Flat surfaces hold less weight and resist pressure less than vertical surfaces. Changing the shape of a material also changes the way it resists forces. Folding the paper, for example, helps it to better resist the bending force created by the weight of the forks.

TRICK 4: BIG ESCAPE

You will need the template marked "D" and a pair of scissors.



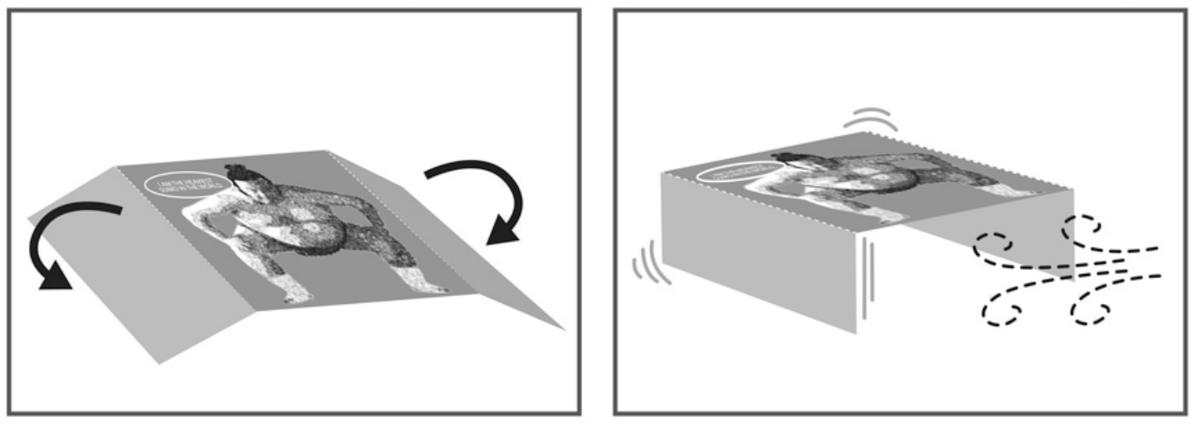
Show the audience the paper template. Challenge them to cut a hole that is big enough for a person to step through. How? Fold the paper along the middle line AB, with the dotted lines facing out. Cut along the dotted lines but do not cut to the edges. Once you have cut along all dotted lines, cut along the folded middle line from A to B. Again do not cut to the edge of the paper. Open the cut paper carefully. A large paper loop is made. Invite a volunteer to step through it!

HOW DOES IT WORK?

This trick demonstrates the relationship between surface and line. A surface is composed of unlimited number of lines. When the surface is transformed into "lines" after cutting, it creates a gap large enough for someone to pass through. If you shorten the distance between each line, the ring will be bigger.

TRICK 5: THE HEAVIEST SUMO

You will need the paper template marked "E" and a pair of scissors.



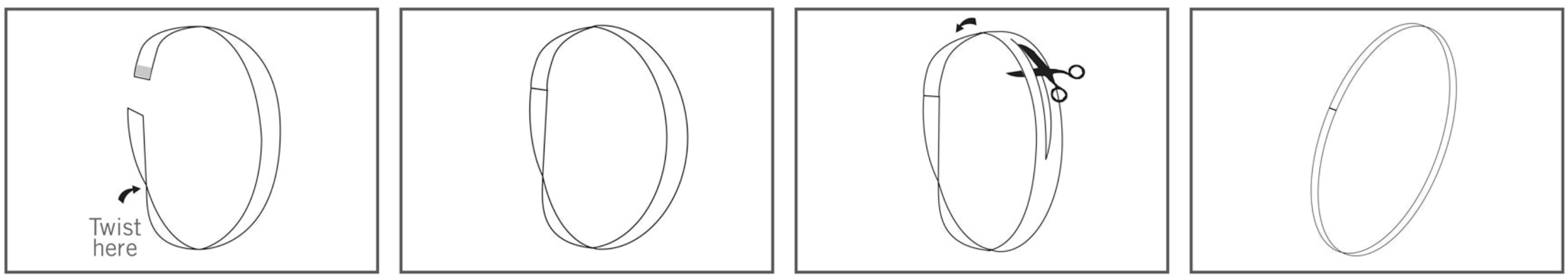
Tell your audience that you have the heaviest paper in the world. Challenge them by announcing that no matter how hard they try, they cannot blow it over. Cut out the sumo paper template. Fold the paper along the dotted lines so that it is like a bench. Ask the audience to blow from the front. Most people will think this will be simple, yet it is almost impossible!

HOW DOES IT WORK?

When you blow the air towards the front of the paper sumo figure, the folded paper will divide the air current into streams above and below the figure. The lower stream flows faster due to the folding design and has lower air pressure. The upper stream flows slower and has higher pressure, which presses upon the paper sumo figure. Therefore, the harder you blow, the harder it stays in place.

TRICK 6: MOBIUS STRIP

You will need the template marked "F", a pair of scissors and glue or adhesive tape.



Before the show, twist the strip once and tape two ends together to form a ring with a twist. Tell the audience that you are going to cut down the middle and ask them to guess what will happen. Most people will expect to see two paper rings! Now start cutting along the middle, and the result will be one large ring. See the surprise on their faces! You can cut the ring along the middle again to form an even larger ring.

HOW DOES IT WORK?

The paper ring is called Mobius Strip, which is derived from the symbol for infinity. It does not have a front or a back. If you try to colour the front of the strip red and later use green for the back, you will end up colouring the whole strip red as it goes on forever. To add more fun to the trick, prepare another long paper strip. This time, twist the strip twice before taping. Cutting the ring down the middle will result in 2 inter-locking rings!

QUESTIONS & COMMENTS

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