# 1.1.2 Can you predict the results?

Making Predictions and Investigating Results

1-9. On a piece of paper provided by your teacher, make a "bracelet" by taping the two ends securely together. Putting tape on both sides of the bracelet will help to make sure the bracelet is secure. In the diagram of the rectangular strip shown below you would tape the ends together so that point A would attach to point C, and point B would attach to point D.
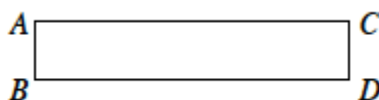
Now **PREDICT** what you think would happen if you were to cut the bracelet down the middle, as shown in the diagram below. Have the recorder write down what the group concludes will happen in the Mobius Strip Experiment Table before you make the cut.


Cut here
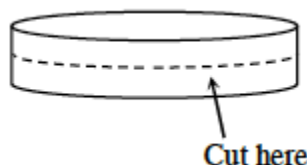
Now cut your strip in half as described above and have the recorder put the **RESULT**, making sure to include a short description of what happened when the bracelet was cut in half.

1-10. On a second strip of paper, label a point X in the center of the strip <u>at least one inch</u> away from one end and place a dot in the corners marked with an A and D, as shown below.

Now turn this strip into a **Mobius strip** by attaching the ends together securely after making <u>one twist</u>. For the strip shown above, the paper would be twisted once so that point A would match up with and attach to point D. Tape the ends together completely as you did in the previous example.

PREDICT what would happen if you were to draw a line down the center of the strip from point X until you ran out of paper.
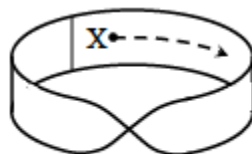
A Möbius Strip

Have the recorder write the group's prediction first in the table on the next line, then draw the line, and record the group's result. Be as detailed as possible in describing what happened when drawing the line on the Mobius Strip.

1-11. What do you think would happen if you were to cut your Möbius strip along the central line you drew in problem 1-10? Record your prediction in your table.

Cut just one of your team's Möbius strips. Record your result in your table. Consider the original strip of paper drawn in problem 1-9 to help you explain why cutting the Möbius strip had this result.

1-12. What else can you learn about Möbius strips? For each experiment below, first record your expectation. Then record your result in your table after conducting the experiment. Use a new Möbius strip for each experiment.

> What if the result from problem 1-11 is cut in half down the middle again?

> What would happen if the Möbius strip is cut one-third of the way from one of the sides of the strip? Be sure to cut a constant distance from the side of the strip.

> What if a strip is formed by 2 twists instead of one? Make sure to label the A and D corners with a dot and this time the dots should be at opposite ends when securing together. What would happen if it were cut down the middle?

> If time allows, make up your own experiment. You might change how many twists you make, where you make your cuts, etc. Try to generalize your findings as you conduct your experiment. Be prepared to share your results with the class.