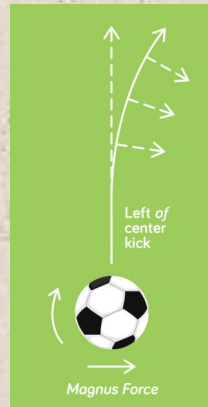
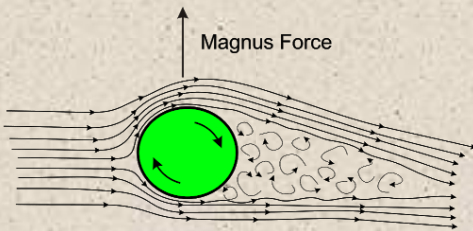




STEM Challenge: Paper Cup Fliers

This cup glider's flight might seem surprising, but scientists have been studying the cause for hundreds of years. It's known as the **Magnus effect**, and it's named after Heinrich Gustav Magnus, a scientist who studied the phenomenon almost 170 years ago. He wasn't the first to look into it though – Isaac Newton noticed its effect on tennis balls 180 years earlier.



The **Magnus effect** is most commonly seen in ball sports. From a bending soccer ball, to a back-spinning table tennis shot, the Magnus effect explains why spinning balls curve as they fly through the air.

As the cups fly through the air, the rotation means the air flows smoothly over the top of the cups, and eventually curves around and down. In return, the air pushes upwards on the cups, making them fly higher.

Using the directions on the next page, build your own paper cup flier. Make predictions about how it will fly and how far it will go. Let other family members try and use a measuring tape to see who can fly their paper cup flier the farthest!

We'd love to see your finished paper cup flier and hear how well they worked. Take a photo/video and send it to us at eplyouthservices@gmail.com!

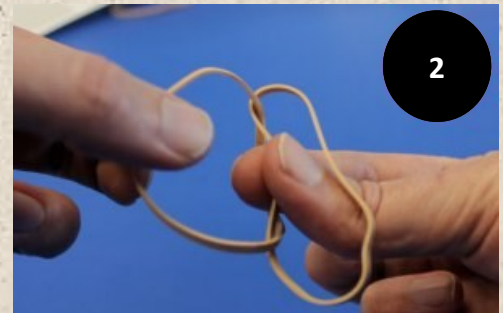
What you need:

2 cups (paper, plastic or foam)
Sticky tape

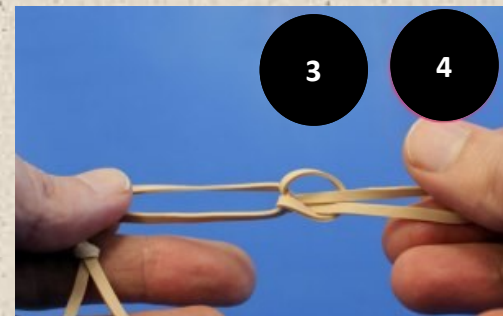
1. Put the cups together so that the bottoms touch and wrap a piece of tape around the join so that they stick together.



2. Hold one rubber band horizontally and hold a second rubber band vertically inside the horizontal rubber band.



3. Push one end of the horizontal band through the vertical band. Pull that end with one hand, and the top of the vertical band with the other hand, in opposite direction making a chain.



4. Continue this pattern with the remaining rubber bands to form a chain, keeping the existing chain at the top of the vertical band. This is your launcher.



5. Keeping everything tight, hold the glider with one hand near your body. With your other hand, hold the launcher away from your body. The launcher should be coming out from under the bottom of the glider. If it's coming off the top, turn the glider over.



6. Make sure the launcher is taut, then let go. It might take a few goes, but when you get it right, the glider will fly and spin up into the air!