

Stay at Home Science



The Magnus Effect

What You Need

- 2 12-oz. plastic or Styrofoam cups
- 4 rubber bands
- Duct or masking tape

What You Do

1. Tape the bottoms of the cups together so that the open sides face out.
2. Make a chain out of the rubber bands by looping one rubber band around the edge of another, then back through itself. Pull to ensure the knot is tight. Continue adding rubber bands to create the chain.
3. Hold one end of the rubber band chain down with your thumb where the cups are joined by the tape.
4. Stretch the rubber bands as they wrap around the cups until there is not much chain left.
5. Hold the hand with the cups behind the hand holding the rubber band chain. Ensure that the rubber bands are coming from the underside of the cups.
6. Aim your front hand up in the air. Gently pull back on the cups, and then release the cups.

Questions to ask

- *What happened?*
- *Try it again while holding your front hand at different angles. Did that have an effect on the outcome?*
- *Try throwing the cups in a straight line, without wrapping the rubber band chain around it first. Did you get the same results?*

What's The Science?

The Magnus Effect is a phenomenon associated with a spinning object moving through the air or another fluid. As the object spins through the air, it drags some of the air around it along with it. The side of the object turning into the air (into the direction of travel) slows the airflow. On the other side, this drag speeds up the airflow. This drag creates areas of higher and lower air pressure on opposite sides of the spinning object. These pressure differences generate a force on the object in the direction of a lower pressure area. As a result, the forward motion of the object is deflected. In baseball, pitchers often give the balls different spins, causing it to curve in the desired direction due to the Magnus effect.

Try This

Use science vocabulary: Use related science words such as rotation as you talk and play together. Children learn new vocabulary words when they hear grown-ups use them in context.

Extend your activity:

- Try cups of differing sizes.
- Try a different cup material.
- Try rubber bands of different thicknesses or lengths.
- Try using fewer or more rubber bands in your chain.
- Add more cups.

Keep In Mind

- Children are natural scientists; let them lead the way in their experimentation!
- The order suggested is not the only right or perfect way. Make adjustments based on the age, ability, and interests of the children.

Additional Resources

The Book of Wildly Spectacular Sports Science: 54 All-Star Experiments by Sean Connolly
Backspin Basketball Flies Off Dam video by Veritasium:
<https://www.youtube.com/watch?v=2OSrvzNW9FE>

