

POPSICLE STICK CATAPULT

MATERIALS

- 5 small popsicle sticks
- 2 large popsicle sticks
- 3 rubber bands
- marshmallows



1

Make a stack of five small popsicle sticks. Use two rubber bands to tightly wrap each end of the stacked popsicles. This is called a **"fulcrum"**.

2

Insert one large popsicle stick between the first and second small popsicle stick in the five-stick bundle.

3

Place the second large popsicle stick under the fifth popsicle stick of the five-stick bundle.

4

Line up the two large popsicle sticks and tie them together at just one end. Try to tie the band as close as you can to the edge of the two-stick bundle.

5

Hold the catapult with one hand, and use the other hand to pull the lever down. Release to launch your marshmallow. The closer the five sticks banded together gets to the edge of the fulcrum, the more leverage the catapult will have.

DID YOU KNOW...



You used **technology** to assist you in building a simple machine known as a lever.



You used **math** to determine the supplies needed.



You used **engineering** skills to construct the catapult.



As a follow-up activity, use **science** to test how far your catapult will fling different projectiles, such as marshmallows, pom poms, or erasers. Which will fly the farthest? Why does one fly farther than another? Make predictions, test them, and record your results.



NEWTON'S THREE LAWS OF MOTION

Sir Isaac Newton, born in 1643, was one of the greatest scientists and mathematicians that ever lived. He was curious about the world and the universe and his discoveries paved the way for modern science and math. He developed the **Three Laws of Motion**, which explain how forces work to move things.



1 **An object at rest will stay at rest.**

An object in motion stays in motion unless acted upon by an unbalanced force. Your soccer ball won't move unless you kick it. Once it's flying through the air, it will continue flying through the air unless it is slowed down by air resistance or makes contact with something else, such as your foot, while gravity works to pull the soccer ball to the ground.

2 **Acceleration occurs when a force acts on mass.**

The greater the mass, the more force is needed to cause acceleration. The harder you kick the soccer ball, the faster it flies, or accelerates. The larger the soccer ball, the harder you must kick.

3 **For every action, there is an equal and opposite reaction.** When you kick your soccer ball, it goes flying. As your foot comes back down, your body feels the force of the kick. You must move to keep your balance.