

# HANDS-ON SCIENCE

*(No Lab Required)*

After reading "Smashing Pumpkins" (p. 16), try this activity to learn how the correct angle helps a catapult hurl pumpkins farther.

## PREDICT

Do you think a pumpkin will fly farther if shot from a catapult at a steep angle, or a less-inclined one?

## MATERIALS

paint stir stick • small block roughly 2.5 centimeters (1 inch) tall • plastic spoon • tape • meter stick • small pan • ruler • mini marshmallows

## DIRECTIONS

- 1 › Build a marshmallow catapult. Begin by setting the small block on the end of the paint stir stick.
- 2 › Place the handle of the spoon on top of the block so the "bowl" of the spoon faces up and sits near the center of the paint stir stick.
- 3 › Wrap tape around the spoon, block, and stick to hold them together tightly.
- 4 › Tape a marshmallow to the bowl of the spoon near the handle. This will act as a ledge to hold your marshmallow.
- 5 › Lay the meter stick on the floor, and place the pan at the 1-meter end.
- 6 › At the other end of the meter stick, hold the launcher so the paint stick is flat on the floor and the block touches the edge of the meter stick.
- 7 › Place a marshmallow into the bowl of the spoon.
- 8 › Keep the block end of the paint stick on the floor. Using the ruler as a guide, lift the other end of the paint stick 2.5 cm (1 in.) above the floor.
- 9 › Pull back on the bowl of the spoon until it touches the stir stick. Then, let go of the bowl of the spoon.

- 10 › Use the meter stick to determine the distance from the launcher to where the marshmallow first lands.
- 11 › Record the height at which the end of the launcher was lifted and the distance the marshmallow traveled.
- 12 › Repeat steps 7 to 11, each time raising the end of the launcher by another 2.5 cm (1 in.) until your marshmallow lands closest to 1 m (1 yard).
- 13 › Make a line graph showing the distance the marshmallow traveled (*y*-axis) for each height you angled the launcher (*x*-axis).

## CONCLUSIONS

- 1 › At which angle height did your marshmallow travel closest to its 1-meter (1-yard) target?
- 2 › Besides changing your launcher's angle, how else could you alter how far the marshmallow flies?

