

## GRAVITY GOING UP?

Sometimes we see things that don't make sense. Have you heard of an anti-gravity game called Shoot the Moon? To play the game, you try to get a marble to *roll up* a track made of two rods. The higher the marble climbs, the more points you get. Make your own Shoot the Moon game using funnels instead of a marble to see how it works.

➤ **Tape the wide mouths of the two funnels together.**

➤ **Place the ends of the two dowel rods close to each other, but not touching.** Wrap a loop of tape around these ends. There needs to be a space between the dowels that can get a little bit wider when you want it to.

➤ **Put a 1-inch-thick book at one end of a table.** Put the taped end of the dowel rods on this book.

➤ **Make a stack of books about 3 inches high at the other end of the table.** Rest the other end of the dowel rods on top of this stack.

### TOOL KIT

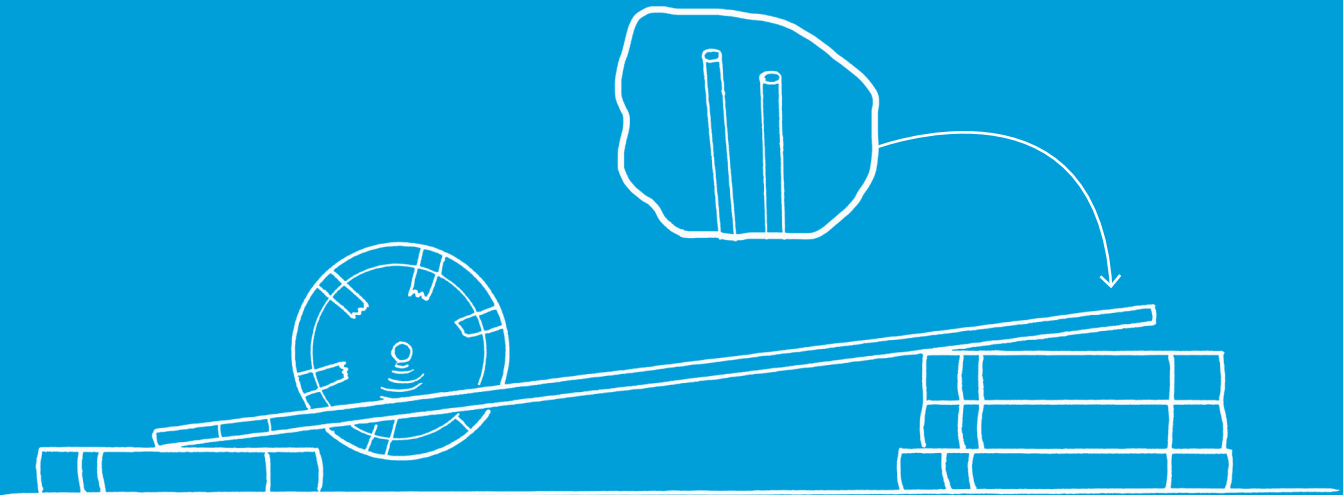
- tape
- 2 identical funnels
- 2 dowel rods, 24 inches long, or broomsticks
- books



Imagine you could travel through planet Earth. Right at the center, you'd be weightless!



## ACTIVITY!



➤ Place the wide part of the taped funnels between the dowel rods on the single book.

➤ Slowly open the gap by moving the top ends of the dowel rods apart. Watch what happens to the funnels.

➤ How far up can you get the funnels to move? What can you change to make the funnels move farther up?

## WHAT'S HAPPENING?

Although the funnels seem to be going against gravity, they really aren't. Try to balance the taped funnels on your two index fingers held together. Where is the center of gravity for the taped funnels? It is at the widest part.

When you put the taped funnels at the lower end of the rods, their center of gravity is on top of the rods. When you move the rods apart, gravity pulls the center of the funnels down between the rods. This makes the funnel tips go uphill while the middle part moves closer to the ground. Gravity is still working the way it always does.

## Try This!

What happens if you change the angle? How can you do this? At what point will the funnel not move up at all? What happens if you add weight to the middle of the funnels?