The Turtle and the Hare

Remember the story of the turtle and the hare?
When the turtle finally passed the finish line, he said, "Slow and steady wins the race."

**What to do:** Fill one of the plastic bottles half full of water. Screw the lid on good and tight. Leave the second bottle empty. Place the two bottles side by side at the top of a ramp or slope. A concrete sidewalk or driveway that runs downhill for a few feet and then levels out will be just fine. You can also make a ramp from two boards of the same length. Place one end of each board on a chair and let the lower ends of the boards rest on the floor as shown in the illustration.

**What happens:** The two bottles start together. But wait! One bottle starts off faster. That's the hare in this race. When the bottles reach the level floor, however, the slower bottle (that's the turtle) rolls farther than the "hare" that took off faster.

**Why:** Rub two things together and you create friction. To prove this, just rub your hands together rapidly. Feel the heat that you generate by the rubbing. Heat is created by friction. The water in the half-filled bottle gives it an extra weight. This added weight made it take off faster down the slope. But the water rubbing against the sides of the half-filled bottle created friction. The friction slowed that bottle down.

Friction not only creates heat: it slows movement. Automobile manufacturers use oil in an automobile engine to cut down on friction and heat. They use grease to lubricate other moving parts for the same reason.

**YOU NEED**
- two large plastic bottles and exactly alike (large soft drink bottles are ideal)
- water
- two boards (or a sloping surface)

Hold the bottles at the top of the slope and then release them at the same time. Watch carefully as they roll down the slope.