



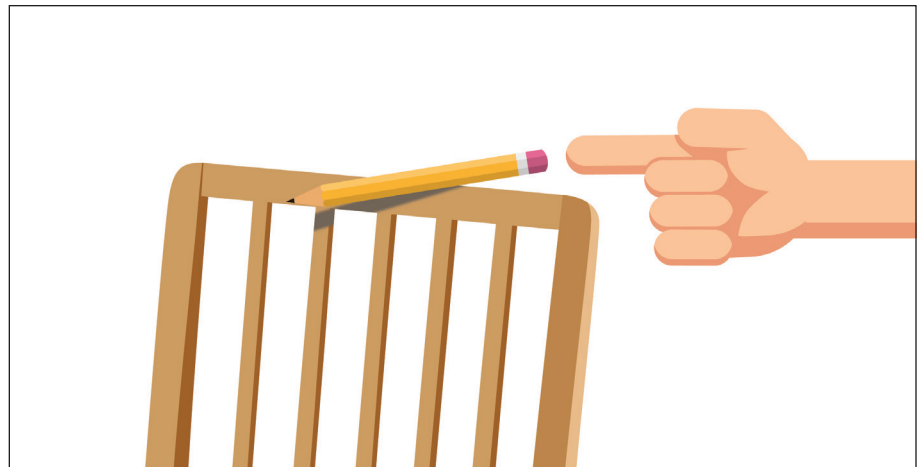
# Charged Fingers: Do you Have the Magic Touch?

## WHAT YOU NEED:

- Wooden pencil
- Carpeted floor or rug
- Wooden or plastic chair
- Any kind of oil (optional)

## DESCRIPTION

Watch as your finger mysteriously moves a pencil without touching it!



## NEXT GENERATION SCIENCE STANDARDS

### • PS2.B: Types of Interactions

- Objects in contact exert forces on each other. (3-PS2-1)
- Electric, and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. (3-PS2-3), (3-PS2-4)

### • PS3.A: Definitions of Energy

- Energy can be moved from place to place by moving objects or through sounds, light, or electric currents. (4-PS3-2), (4-PS3-3)

## WHAT YOU DO

1. Place a chair on the carpet or rug.
2. Place a wooden pencil on the back of the chair. Balance the pencil at its midpoint.

If necessary, place a drop of oil between the pencil and the chair to help balance the pencil. The pencil must be free to rotate.

3. Wipe your feet across the carpet. This builds up a static charge on the surface of your body. Bring a finger close to either end of the pencil.
4. Slowly move your finger back and forth, perpendicular to the end of the pencil. The pencil should rotate, following the motion of your finger. With practice, you can cause the pencil to rotate in a complete circle without touching it.

## WHAT HAPPENS

Wiping your feet on the carpet generates a static charge on the surface of your body. Electrons eventually spread out over your entire body. Moisture in your skin creates pathways for the flow of electrons. The pencil has no charge, but its neutral state is positive when compared to the negatively charged electrons on the surface of your skin. This difference in charge is enough to cause the pencil to move.

## WHERE IN THE WORLD

Static electricity is all around us. Here are a few examples:

1. Photocopiers - Many parts of the photocopier work together to create a fresh copied piece of paper. Static electricity is the magic behind how the tiny particles of ink make it onto the paper.
2. Lightning - When there is a build-up of static electricity inside of a storm cloud, we get lightning.

Can you think of more examples of static electricity in real-life?