

## High-Speed Energy Procedure (Teacher Master)

### Materials

*For each team of 4 students:*

- 1 ruler (with a groove down the middle)
- 1 marble
- Blocks of wood (or notepads), 1/2 inch high (to elevate the ramp)
- Small block of Styrofoam (with a groove cut out on one side)
- 2 pieces of plain white paper
- Tape

### Procedure

1. Set up a ramp like Ramp 1 on handout 2.1 (Ramps, Speed, and Energy). Use a ruler with a groove as a ramp and a block of wood (or notepads) about 1/2 inch high to raise up the ramp.
2. Place the short edge of a piece of white paper at the bottom end of the ruler ramp and tape it to the table.
3. Place a small Styrofoam block at the end of the ramp with the grooved side of the Styrofoam facing the ramp. The Styrofoam should sit on top of the paper almost touching the ramp.
4. Roll the marble down the ruler ramp so it rolls straight into the groove in the Styrofoam block. The marble should push the Styrofoam across the paper. When the marble and Styrofoam block stop moving, use a pencil to make a mark on the paper where the Styrofoam stopped. Place the mark on the side of the Styrofoam that is closest to the ruler ramp.
5. Repeat steps 3 and 4 two more times.
6. Circle the middle of the three marks on the paper.
7. Using the ruler, measure the distance from the middle mark to the edge of the paper closest to the ramp.
8. Record this measurement in the correct space on handout 2.1 (section 2: Distance Styrofoam block moved).
9. Use the ruler to measure the height of the ramp. Record this measurement in the correct space on handout 2.1 (section 4: Height of the ramp)
10. Set up a steeper ramp like Ramp 2 on handout 2.1. Use the same ruler and add more blocks of wood (or notepads) to increase the height of the ramp.
11. Repeat steps 2 through 9 for Ramp 2.