Connecting With Your Child

Marbles and Ramps

To help your child recognize the relationship between speed and energy, you can conduct a simple investigation.

Materials

- Books or something to stack in order to build a small ramp
- A marble
- A ruler or something to roll the marble down
- An object for the rolling marble to hit and push, such as a paper cup

Begin by building a simple ramp, using the books and ruler. Place the paper cup in the path the marble will travel after it rolls down the ramp. Place the marble near the bottom of the ramp, and let it go so that it runs into the paper cup and pushes it. Ask your child to make a prediction about what will happen if the marble is released from the middle of the ramp. Will it push the paper cup a shorter distance, the same distance, or a farther distance? Try it and see. Then repeat the process while holding the marble near the top of the ramp and releasing it.

Assuming that everything else stays the same, when the marble is released from higher up on the ruler, it should push the paper cup farther than when it is released from lower on the ramp.

Here are some questions to discuss with your child:

1. In which situation does the marble have more speed, when released from the top of the ramp or when released from a lower point on the ramp?
2. In which situation does the marble have more energy, when released from the top of the ramp or when released from a lower point on the ramp?
3. How is energy of the marble related to the speed of the marble in each situation?
4. At which point is the energy transferred from the marble to the paper cup?