THE STANDARD

Speed & Energy

Use evidence to construct an explanation relating the speed of an object to the energy of that object.

ANCHORING PHENOMENON

The Higher Ramp Sends the Cup Flying

A marble rolls down a ramp and slams into a plastic cup at the bottom. Raise the top of the ramp higher and the same marble reaches the bottom moving faster. Each time it's faster, the cup skids farther across the floor. Same marble, same cup, but the distance keeps growing. 4th graders will want to know why.

DRIVING QUESTION

"Why does letting the marble start from higher up make it push the cup farther?"

INVESTIGATIVE 1

Same Marble, Different Push

No ramp this time. Flick the same marble across a smooth table, once gently and once hard, into a paper cup. The hard flick sends the cup farther every time. Use this one to sharpen the anchor's big question: it's the speed that changes the energy, not the ramp or the height.

DRIVING QUESTION

"If we use the very same marble, what makes it move the cup farther some times than others?"

INVESTIGATIVE 2

Fast Marble Down the Domino Line

Stand up a row of dominoes and roll a marble into the front one, first slowly, then quickly. The slow marble knocks down a few. The fast marble runs the energy farther down the line. Same setup as the anchor, but now you can watch the energy travel from object to object.

DRIVING QUESTION

"How far down the line does the marble's energy travel, and what decides that?"