

Energy of Motion

Kinetic Coaster with Zingling

Learning target

Use observations to compare effects of moving objects.



Before you begin

Use the reference page and discussion prompts on their own, or open the optional browser adventure. No earlier lesson or physical kit is required.

For online play: use an internet-connected current browser with local storage enabled. Read the three-part Gemling briefing, answer the quick check, and apply the evidence at three checkpoints. Retry feedback supports review; results are not a secure test or gradebook.

Use for teacher-led review, science centers or partner practice. Independent readers may need support with the vocabulary below. The design target is grades 3-5; choose support based on the learner.

Vocabulary and concepts to discuss

Moving objects; speed; collision effects; qualitative comparisons

Open Kinetic Coaster - direct lesson link

Scan the QR code or use the clickable link. This guide is usable offline; the adventure runs on an external educational website.



Energy of Motion - key ideas

1. The first clues

Moving objects have energy of motion. For the same object, greater speed means more energy of motion.

2. How the clues connect

Collisions can transfer energy to other objects and change their motion or shape. Compare the same object to isolate the effect of speed.

3. Our evidence record

Our model sends the same cart into the same soft barrier at two speeds. The faster trial makes a larger dent. That result supports a speed-related difference under these conditions.

Keep the science accurate

Use qualitative energy evidence; no kinetic/potential-energy equations. Energy is transferred, not simply destroyed when a device stops.

Apply the evidence

Use a specific observation from this lesson to explain one choice. Point to a clue, then connect that clue to a scientific idea.

Curriculum reference: <https://www.nextgenscience.org/dci-arrangement/4-ps3-energy>

Talk through the evidence

1. Which same-cart trial has more motion energy?

Expected answer: The faster one

Reasoning: Moving objects have energy of motion. For the same object, greater speed means more energy of motion.

2. What is kept the same in the comparison?

Expected answer: Cart and barrier

Reasoning: Our model sends the same cart into the same soft barrier at two speeds. The faster trial makes a larger dent. That result supports a speed-related difference under these conditions.

3. What evidence differs in the record?

Expected answer: Dent size

Reasoning: Our model sends the same cart into the same soft barrier at two speeds. The faster trial makes a larger dent. That result supports a speed-related difference under these conditions.

4. Why avoid comparing unrelated carts here?

Expected answer: Different masses or structures could affect the result

Reasoning: Our model sends the same cart into the same soft barrier at two speeds. The faster trial makes a larger dent. That result supports a speed-related difference under these conditions.

Guide the discussion

Ask learners to name the evidence that supports their answer. If an answer differs, revisit the matching key idea on page 2 and invite a revised explanation.

Online rewards: this lesson grants one fixed digital Expedition Discovery. Five saved digital Gemling friends become available only after all six distinct subject lessons are complete, in any order. Digital rewards do not establish physical ownership.