

Predicting & Testing Motion

Runaway Engine Vault with Zoomling

Learning target

Use a force model and trial results to solve a motion problem.



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

Combined forces; repeated trials; evidence; improving a solution

Open Runaway Engine Vault - 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.



Predicting & Testing Motion - key ideas

1. The first clues

Motion predictions improve when they use repeated test evidence. Compare relevant conditions and recognize that a model has limits.

2. How the clues connect

A stopping design should meet the goal under the tested conditions. Forces from surfaces or barriers can change the cart's motion.

3. Our evidence record

Our three trials show a textured stopping zone stopping the cart within the marked area each time; a smooth zone lets it pass. The textured design fits the recorded goal, while more conditions could need more testing.

Keep the science accurate

Keep force and speed comparisons qualitative or simple. No formal Newton-law algebra or momentum calculations.

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/3-ps2-motion-and-stability-forces-and-interactions>

Talk through the evidence

1. Which design meets the stopping goal in these trials?

Expected answer: The textured zone

Reasoning: Our three trials show a textured stopping zone stopping the cart within the marked area each time; a smooth zone lets it pass. The textured design fits the recorded goal, while more conditions could need more testing.

2. Why repeat a trial?

Expected answer: To check the result's consistency

Reasoning: Our three trials show a textured stopping zone stopping the cart within the marked area each time; a smooth zone lets it pass. The textured design fits the recorded goal, while more conditions could need more testing.

3. Which evidence supports the choice?

Expected answer: The cart stopped within the marked area

Reasoning: Our three trials show a textured stopping zone stopping the cart within the marked area each time; a smooth zone lets it pass. The textured design fits the recorded goal, while more conditions could need more testing.

4. Does this guarantee every cart at every speed will stop there?

Expected answer: No

Reasoning: A stopping design should meet the goal under the tested conditions. Forces from surfaces or barriers can change the cart's motion.

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.