

Speed Energy Detectives

Use speed evidence to explain energy of motion.

GRADE 4 • 4-PS3-1

4-PS3-1 "Use evidence to construct an explanation relating the speed of an object to the energy of that object. Assessment Boundary: Assessment does not include quantitative measures of changes in the speed of an object or on any precise or..."

NAME _____

DATE _____

SPEED AND ENERGY

Energy of motion is energy an object has because it is moving. When the same object moves faster, it has more energy of motion.

WORKED EXAMPLE

A squirrel runs across a lawn faster than it did a moment ago. When does it have more energy of motion?

1. Evidence: The squirrel is moving faster now.
2. Rule: Faster motion means more energy of motion.
3. Conclusion: It has more energy now.

Answer: The squirrel has more energy of motion now because it is moving faster.

PRACTICE 5 problems

- 1** A soccer ball rolls slowly, then rolls faster. When does it have more energy of motion?

ANSWER _____

- 2** A toy car moves fast on one trip and slow on another trip. Which trip gives the toy car more energy of motion?

ANSWER _____

- 3** Finish the explanation: A marble is moving faster, so it has ____ energy of motion.

ANSWER _____

- 4** The same swing moves fast at first and slower later. Which claim is correct?

ANSWER _____

- 5** Jordan says a bike has less energy of motion when it goes faster. Is Jordan correct?

ANSWER _____

APPLY IT Show your work

- 1** At the skate park, Kai rides the same scooter slowly before lunch and quickly after lunch. Write one sentence explaining when the scooter has more energy of motion.

WORK SPACE

ANSWER _____

- 2** A remote-control race car travels faster on the final lap than on the first lap. Which lap has more energy of motion? Use speed as evidence.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

The same basketball is rolled slowly, at a medium speed, and fast. Put the three rolls in order from most energy of motion to least. Explain why.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A soccer ball rolls slowly, then rolls faster. When does it have more energy of motion?	It has more energy of motion when it rolls faster.
2	A toy car moves fast on one trip and slow on another trip. Which trip gives the toy car more energy of motion?	The fast trip gives the toy car more energy of motion.
3	Finish the explanation: A marble is moving faster, so it has ____ energy of motion.	more
4	The same swing moves fast at first and slower later. Which claim is correct?	The swing has more energy of motion when it moves fast.
5	Jordan says a bike has less energy of motion when it goes faster. Is Jordan correct?	No. The bike has more energy of motion when it goes faster.

PART 2 • APPLY IT

1. **The scooter has more energy of motion after lunch because it is moving more quickly.** Accept an explanation that names the after-lunch ride and uses its faster speed as evidence.
2. **The final lap has more energy of motion because the race car travels faster.** The final lap is faster, so the same race car has more energy of motion then.

CHALLENGE

Fast, medium speed, slow. The same basketball has more energy of motion when it moves faster.

Accept equivalent wording such as "more energy because it is faster." Students should use speed as evidence and compare the same object at different speeds.