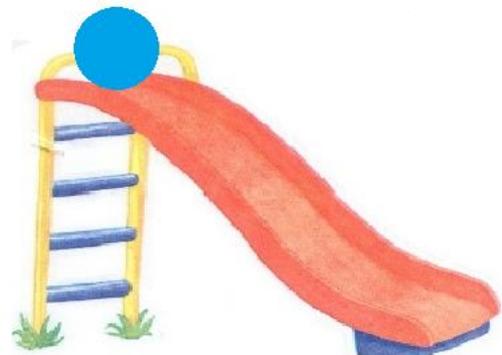


### Summative Evaluation (Answer Key)

The green and red balls are the same size. The green ball will start at the top of a 6 feet tall slide and the blue ball will start at the top of a 3 feet tall slide. Which ball will travel farther? Explain your choice.



Picture A (6 feet)



Picture B (3 feet)

### Answer Key

**Response:** Green Ball with travel farther than the blue ball.

**Explanation<sup>1</sup>:** Green ball is dropped from a greater height (6 feet tall slide) than the blue ball (3 feet tall slide). Greater the height, the more is the energy possessed<sup>2</sup> by the ball (potential energy), the more is the distance traveled by the ball after it hits the ground (because of kinetic energy). Therefore, green ball will have more energy and will travel to a greater distance on the ground.

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<sup>1</sup>Note that the explanation provided in the answer key is only one way of explaining the correct response. Students should; however, be able to demonstrate the understanding of the relationship between height, energy and distance travelled by the ball in their own words. Students could also relate to the ramp and ball experiment they conducted in the class and provide some of the results as the evidence to support their response to the assessment probe.

<sup>2</sup>Note that it is not necessary for young children to use the word “possessed”. They might instead use simpler language in their explanations, which should to be scientifically correct. They should; however, be able to demonstrate the understanding of the relationship between height, energy and distance travelled by the ball.

## Rubrics

The rubrics below can be used **by the teacher** to assess students' responses to the summative assessment probe.

NAME \_\_\_\_\_

DATE \_\_\_\_\_

SCORE \_\_\_\_\_ / 5

### Response:

Category	1	0
Identifying the correct color ball to travel farther than the other.	Student identified the correct ball (green ball).	Student identified the incorrect ball (blue ball).

### Explanations:

Category	2	1	0
Scientific reasoning.	Student provides scientifically-correct reasoning that includes the height from which the green ball is dropped, which is more than the height of the slide from which the blue ball is dropped.	Student provides correct reasoning but lacks sufficient details (for example, student does not mention that the height from which green ball (6 feet) is dropped is more than the height (3 feet) from which the blue ball is dropped.	Student does not include reasoning to the response.
Appropriate connections to demonstrate the relationship between height, energy and the distance traveled by the ball on ground.	Student provides all of the three connections to demonstrate the relationship between height, energy and the distance traveled by the ball on the ground. (More the height, more is the energy, greater is the distance traveled by the ball on the ground).	Student provides two of the three connections in their explanations. This may include relationship between height and energy but distance traveled on the ground is not mentioned, or height and distance traveled by the ball on the ground is mentioned; however, energy connection is not included.	Student provides no connections demonstrate the relationship between height, energy and the distance traveled by the ball on ground or provides incorrect relationship between height, energy and distance traveled by the ball on the ground.

<b>Assessment Chart</b>		
<b>Phases of 5E</b>	<b>Activity</b>	<b>Assessment</b>
Engage	Game play called “Simon Says” where students respond to different motions as they are called out. For instance, clapping hands.	-Asking probing questions to gauge prior knowledge.  -Listening to students’ responses.
Explore	Scientific investigations – Ball is dropped from three different ramp heights. The distance traveled by the ball on the ground is measured using hand-measurement for each trial for three different heights.	-Reviewing predictions student worksheet about the number of handprints for each height.  -Reviewing data recording sheet where students recorded their experimental data.  -Asking probing questions.  -Listening to students’ evidence-based explanations.
Explain	Students will develop their evidence-based explanations from the data they collected. Students will make connections between the height from which the ball is dropped and the distance traveled on ground.  Teachers introduces new scientific vocabulary on energy.	-Asking probing questions.  -Listening to students’ evidence-based explanations to assess their understanding about the relationship between height at which the ball is dropped, distance travelled on the floor and energy possessed by the ball.
Elaborate	Simple experiments with Newton’s Cradle where balls are dropped from a certain height.	-Asking probing questions.  -Listening to students’ predictions.
Evaluate	Students share concluding statements about lesson learned about energy.	-Summative Assessment Probe (could also be used at the engage phase as a pre-assessment).  -Listening to students’ concluding remarks on what they learned about

		energy.
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