



**NEW ENGLAND
COMMON ASSESSMENT PROGRAM**

**Released Items
Support Materials
2014**

**Grade 4
Science**

**NECAP 2014 RELEASED ITEMS
GRADE 4 SCIENCE**

Grade 4 Science Released Item Information

Item Number	Big Idea ¹	Assessment Target	Depth of Knowledge Code	Item Type ²	Answer Key	Total Possible Points
1	INQ	PS 1-1	2	MC	B	1
2	SAE	PS 2-6	2	MC	A	1
3	SAE	PS 3-8	2	MC	C	1
4	NOS	ESS 1-3	2	MC	A	1
5	SAE	ESS 1-4	2	MC	D	1
6	FAF	ESS 1-6	2	MC	C	1
7	INQ	ESS 1-2	2	CR		4
8	INQ	LS 1-1	2	MC	B	1
9	SAE	LS 2-5	2	MC	B	1
10	SAE	LS 3-7	2	MC	B	1

Grade 4 Science Released Inquiry Task Information

Item Number	Big Idea ¹	Inquiry Construct	Depth of Knowledge Code	Item Type ²	Total Possible Points
1	INQ	8	2	CR	3
2	INQ	12	3	SA	2
3	INQ	9	2	SA	2
4	INQ	6	2	SA	2
5	INQ	13	3	SA	2
6	INQ	1	2	SA	2
7	INQ	4	3	CR	3
8	INQ	13	3	SA	2

¹Big Idea: NOS = Nature of Science, SAE = Systems and Energy, MAS = Models and Scale, POC = Patterns of Change, FAF = Form and Function, INQ = Scientific Inquiry

²Item Type: MC = Multiple Choice, CR = Constructed Response, SA = Short Answer

**NECAP 2014 RELEASED ITEMS
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PS1 (K-4) INQ-1 Collect and organize data about physical properties in order to classify objects or draw conclusions about objects and their characteristic properties (e.g., temperature, color, size, shape, weight, texture, flexibility).

- ① Four different objects were put under a hot lamp. After 30 minutes, changes to the objects were recorded in the table shown below.

**Changes to Objects
under a Hot Lamp**

	Object			
	1	2	3	4
Temperature	✓	✓	✓	✓
Shape		✓		
Weight				✓
Color	✓			✓

Key ✓ = change

Which object is **most likely** ice cream?

- A. Object 1
- B. Object 2
- C. Object 3
- D. Object 4

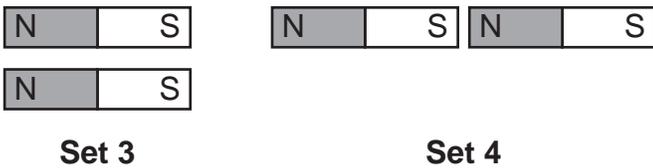
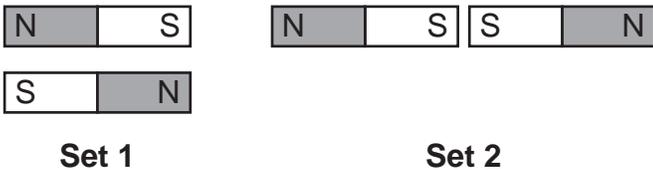
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PS2 (K-4) SAE-6 Experiment, observe, or predict how heat might move from one object to another.

- 2 A student puts a 38°C metal spoon into a jar of 5°C water. What are the **most likely** temperatures of the metal spoon and the water after five minutes?
- A. metal spoon: 34°C, water: 6°C
 - B. metal spoon: 35°C, water: 4°C
 - C. metal spoon: 38°C, water: 5°C
 - D. metal spoon: 39°C, water: 4°C

PS3 (K-4) SAE-8 Use observations of magnets in relation to other objects to describe the properties of magnetism (i.e., attract or repel certain objects or has no effect).

- 3 Four sets of magnets are shown in the diagrams below.



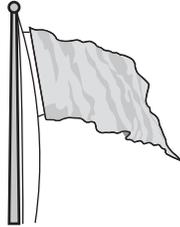
The magnets in which sets will push each other apart?

- A. Sets 1 and 2
- B. Sets 1 and 4
- C. Sets 2 and 3
- D. Sets 2 and 4

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ESS1 (K-4) NOS-3 Explain how the use of scientific tools helps to extend senses and gather data about weather (i.e., weather/wind vane: direction; wind sock: wind intensity; anemometer: speed; thermometer: temperature; meter sticks/rulers: snow depth; rain gauges: rain amount in inches).

- 4 A student sees a flag waving gently, as shown below.



The effects of different wind speeds are shown in the chart below.

Effects of Wind Speeds

Wind Speed	Description of Wind Effects	Appearance of Wind Effects
4–7 mph	Smoke drifts with wind.	
13–18 mph	Loose paper blows around.	
25–31 mph	Umbrellas blow inside out.	
39–46 mph	Branches are ripped off trees.	
55–63 mph	Trees are snapped in half.	

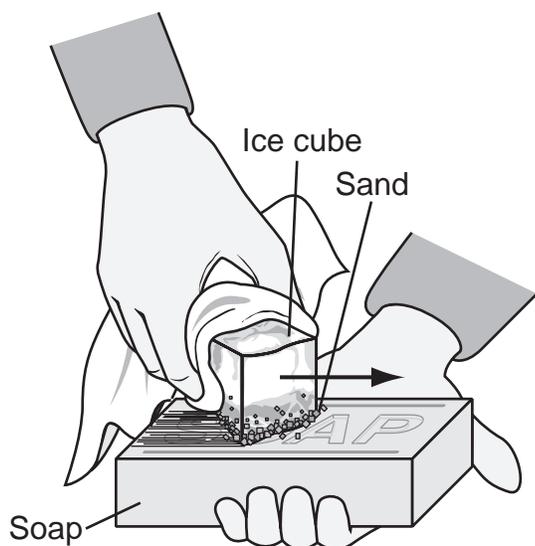
Based on the wind chart, which wind speed is **most likely** causing the flag to wave gently?

- A. about 10 mph
- B. about 22 mph
- C. about 35 mph
- D. about 51 mph

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ESS1 (K-4) SAE-4 Explain how wind, water, or ice shape and reshape the Earth's surface.

- 5 A student is pushing an ice cube and sand across the top of a bar of soap to show how Earth's surface can be changed, as shown in the diagram below.



Which change to Earth's surface is the student **most likely** showing?

- A. how an island is formed by a river
- B. how a mountain is formed by a volcano
- C. how a sand dune is formed by wind
- D. how a valley is formed by a glacier

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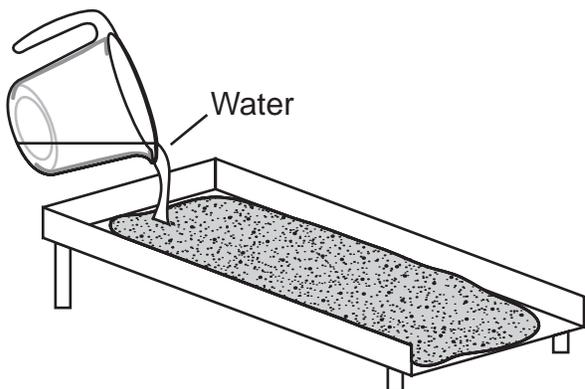
ESS1 (K-4) FAF-6 Given information about Earth materials, explain how their characteristics lend themselves to specific uses.

- 6** Granite is a rock found in New England. Which characteristics make granite a good material for the floors of buildings?
- A. Granite is lightweight and soft.
 - B. Granite is shiny and bends easily.
 - C. Granite is hard and lasts a long time.
 - D. Granite is an inexpensive renewable resource.

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ESS1 (K-4) INQ-2 Use results from an experiment to draw conclusions about how water interacts with earth materials (e.g., percolation, erosion, frost heaves).

- 7 A student sets up an experiment to show what happens to sand on a hill when it rains. In the experiment, the student pours one cup of water into a tray of dry sand, as shown below.



The student measures the amount of sand that washes out of the tray. The student repeats the experiment three times. The table below shows the results.

Results of Sand Test

Test	Amount of Sand That Washes Out
1	25 mL
2	27 mL
3	24 mL

- a. Describe **one** way the student could change the experiment so that more sand would wash out of the tray. Explain why more sand would wash out.

- b. The student repeats the experiment using gravel instead of sand. Predict how the results would compare to the results for sand. Explain your reasoning.

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Scoring Guide

Score	Description
4	The response demonstrates a thorough understanding of how to use results from an experiment to draw conclusions about how water interacts with earth materials. The response describes in detail one way the student could change the experiment so that more sand would wash out of the tray and explains in detail why more sand would wash out. The response also predicts how the results would compare to the results for sand if the student used gravel in the experiment instead of sand and explains the reasoning in detail.
3	The response demonstrates a general understanding of how to use results from an experiment to draw conclusions about how water interacts with earth materials. The overall response is general.
2	The response demonstrates a limited understanding of how to use results from an experiment to draw conclusions about how water interacts with earth materials. The overall response is limited.
1	The response demonstrates a minimal understanding of how to use results from an experiment to draw conclusions about how water interacts with earth materials. The overall response is minimal.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

Part a: A thorough response can be exemplified by **one** of the following sample responses:

Description	Explanation (Why)
Make the tray steeper	because the water would flow faster and be able to push harder on the sand
Pour more water	because more water will be able to carry more sand
Pour the water faster	because faster moving water pushes harder on the sand than slower moving water
Use less sand in the tray	because if there is more water in proportion to the amount of sand, more sand will wash out

Sentence responses are also acceptable.

Part b: A thorough response can be exemplified by the following sample response:

Less gravel* will wash out of the tray than sand because gravel has larger pieces than sand; larger pieces are harder to move with flowing water. [*less than 24 mL]

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SCORE POINT 4

7 One way the student could get more sand to wash away is to tilt the tray up. If you do this the water will flow more under the sand and wash it down.

If the student used gravel instead of sand the gravel would have washed out less. The gravel is heavier than the sand so it will not go down as much.

The response demonstrates a thorough understanding of the task. In Part A, the response correctly describes and explains how the student could change the experiment to displace more sand. The response also gives a logical prediction with an explanation in Part B.

7 More and more sand would come out if there was more pressure because if there is more pressure the more the sand will come out faster.

If you use gravel it will be much heavier than sand because sand is so small and gravel is bigger. You would have to have lots of water pressure to move gravel.

In Part A, while the idea is generally correct, the response does not clarify how one would achieve an increase in pressure. In Part B, the explanation is valid, but there is no clearly stated prediction. These slight omissions make the response general instead of thorough.

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SCORE POINT 2

- 7 One way that more sand would wash out is if you put more sand into the tray. I think that because if there is more sand, there is more sand to wash out!
- If the student put gravel into the tray instead of sand, I think that not as much of it will wash out. I think that because gravel is heavier, so it would be harder to push.

The response demonstrates a limited understanding. Part A does not receive credit for adding more sand into the tray. The response should address a change in the angle of the ramp or in the amount or rate of the water being added. Part B has a logical prediction and explanation.

SCORE POINT 1

- 7 A. You put more water in.
- B. More water would make more sand go down.

The response demonstrates a minimal understanding by giving a correct change in Part A, but there is no explanation. Part B is irrelevant to the prompt.

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SCORE POINT 0

- 7 A. The sand would wash out because the pressure of the water would push and get all the sand out.
- B. The water would push the gravel and the gravel would fall out.

The response does not demonstrate understanding. In Part A, no change to the experiment is described. In Part B, there is no prediction and the comment is irrelevant to the prompt.

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LS1 (K-4) INQ-1 Sort/classify different living things using similar and different characteristics. Describe why organisms belong to each group or cite evidence about how they are alike or not alike.

- 8 The table below lists some of the foods different kinds of birds eat.

Foods Birds Eat

Bird	Foods
Eagle	<ul style="list-style-type: none">• Rabbits• Squirrels
Goose	<ul style="list-style-type: none">• Plants• Grasses
Robin	<ul style="list-style-type: none">• Worms• Fruit
Sparrow	<ul style="list-style-type: none">• Seeds• Insects
Swan	<ul style="list-style-type: none">• Plants• Grasses
Turkey	<ul style="list-style-type: none">• Seeds• Insects• Salamanders

Based on the table, which birds **most likely** have similar beaks?

- A. eagle and turkey
- B. goose and swan
- C. robin and sparrow
- D. sparrow and turkey

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LS2 (K-4) SAE-5 Recognize that energy is needed for all organisms to stay alive and grow or identify where a plant or animal gets its energy.

- 9 A student put a bean plant in a dark room and watered it every other day. At the end of two weeks, the bean plant was dead.

Why did the bean plant die?

- A. It needed air.
- B. It needed energy.
- C. It needed space.
- D. It needed water.

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LS3 (K-4) SAE-7 Using information (data or scenario), explain how changes in the environment can cause organisms to respond (e.g., survive there and reproduce, move away, die).

- 10 A sparrow is a small bird that lives in New England. Bird-watchers counted sparrows one day every December for five years. The table below shows the data they collected.

Sparrow Data

Year	Number of Sparrows	Temperature
1	45	30°F
2	15	18°F
3	60	35°F
4	10	15°F
5	75	50°F

Based on the data, which conclusion is the **most** reasonable?

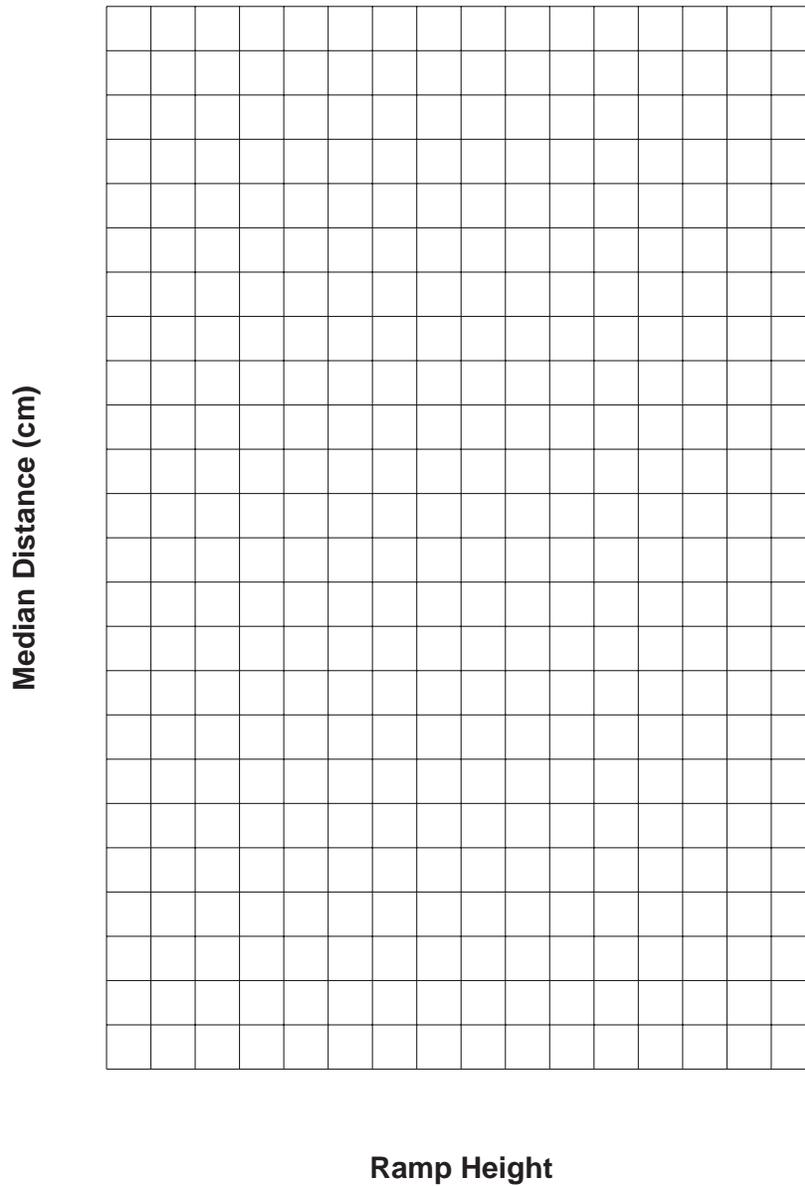
- A. Cold winters occur more often than warm winters.
- B. More sparrows survive during a warm winter than during a cold winter.
- C. More sparrow eggs hatch during a warm winter than during a cold winter.
- D. Cold winters have more snowfall than warm winters.

**NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

Broad Area of Inquiry:	Conducting Investigations
Inquiry Construct 8:	Use accepted methods for organizing, representing, and manipulating data.

- ① Use the data you recorded in Data Table 3 on page 10 to make a bar graph that shows the **median** distances the toy skateboard rolled at ramp heights of **1 block** and **2 blocks**. Label and title your graph.

Title: _____



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Data Table 3: Distance of Toy Skateboard's Roll (cm)

Ramp Height	Median
1 block	
2 blocks	

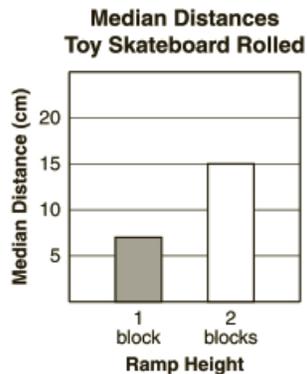
Scoring Guide

Score	Description
3	The response demonstrates a thorough understanding of how to accurately represent data in a graph. The response includes a bar graph of the median distances the toy skateboard rolled at both ramp heights with proper axes, labels, and data points.
2	The response demonstrates a general understanding of how to accurately represent data in a graph. The overall response is general.
1	The response demonstrates a limited understanding of how to accurately represent data in a graph. The overall response is limited.
0	Response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

Sample Response:

[Sample] Data Table 3: Distance of Toy Skateboard's Roll

Ramp Height	Median
1 block	7
2 blocks	15



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Scoring Notes:

A thorough understanding can be exemplified by including the following in the sample response:

- Median data used for both 1-block and 2-block data sets
- Appropriate title
- Labels for 1 block and 2 blocks
- Range from zero to maximum median distance on y-axis (vertical) with clearly marked subdivisions (single cm, multiples of cm) so that bar height values can be easily determined

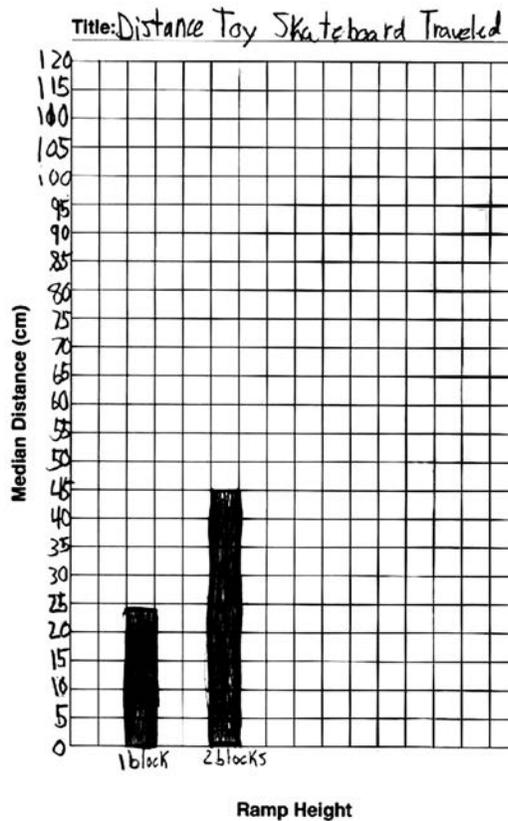
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SCORE POINT 3

Data Table 3: Distance of Toy Skateboard's Roll (cm)

Ramp Height	Median
1 block	24 cm
2 blocks	45 cm

- ① Use the data you recorded in Data Table 3 on page 10 to make a bar graph that shows the **median** distances the toy skateboard rolled at ramp heights of **1 block** and **2 blocks**. Label and title your graph.



The response demonstrates a thorough understanding of the task. The response includes a bar graph of the correct median values, a consistent scale, labels for 1 and 2 blocks, an appropriate title, and an appropriate range.

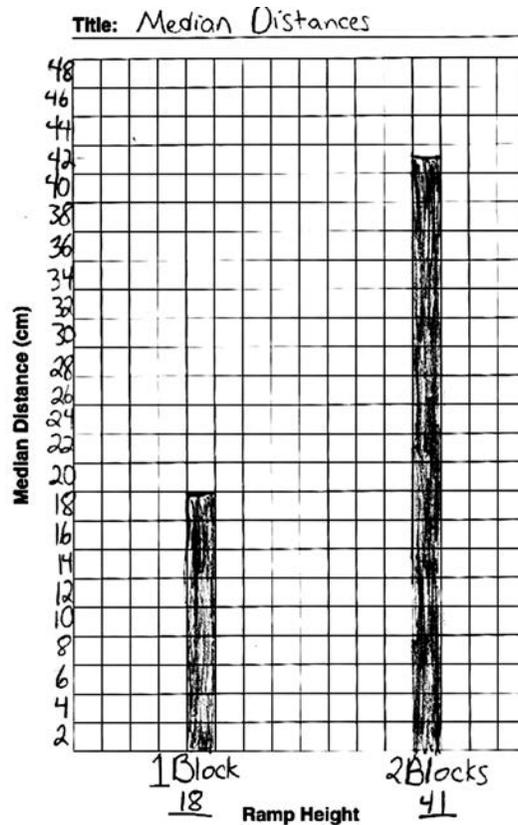
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SCORE POINT 2

Data Table 3: Distance of Toy Skateboard's Roll (cm)

Ramp Height	Median
1 block	18 cm
2 blocks	41 cm

- 1 Use the data you recorded in Data Table 3 on page 10 to make a bar graph that shows the **median** distances the toy skateboard rolled at ramp heights of **1 block** and **2 blocks**. Label and title your graph.



The response demonstrates a general understanding. The graph has generally correct data points, is labeled, has a consistent scale and an appropriate range, but the scale does not start at zero and does not align properly with the grid.

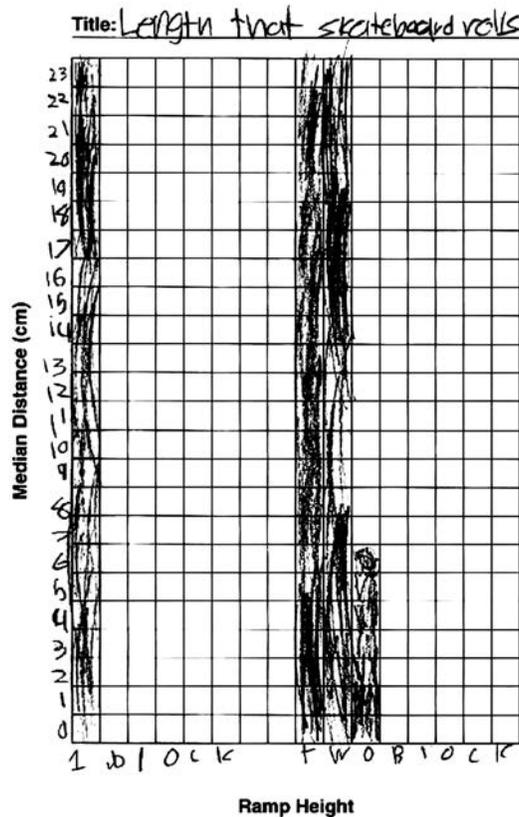
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SCORE POINT 1

Data Table 3: Distance of Toy Skateboard's Roll (cm)

Ramp Height	Median
1 block	23 cm
2 blocks	54 cm

- 1 Use the data you recorded in Data Table 3 on page 10 to make a bar graph that shows the **median** distances the toy skateboard rolled at ramp heights of **1 block** and **2 blocks**. Label and title your graph.



The graph contains correct labels and a correct bar for the 1 block median value, but the 2 block median value is charted incorrectly. Also, the scale on the y-axis has an inappropriate range and does not align with the grid.

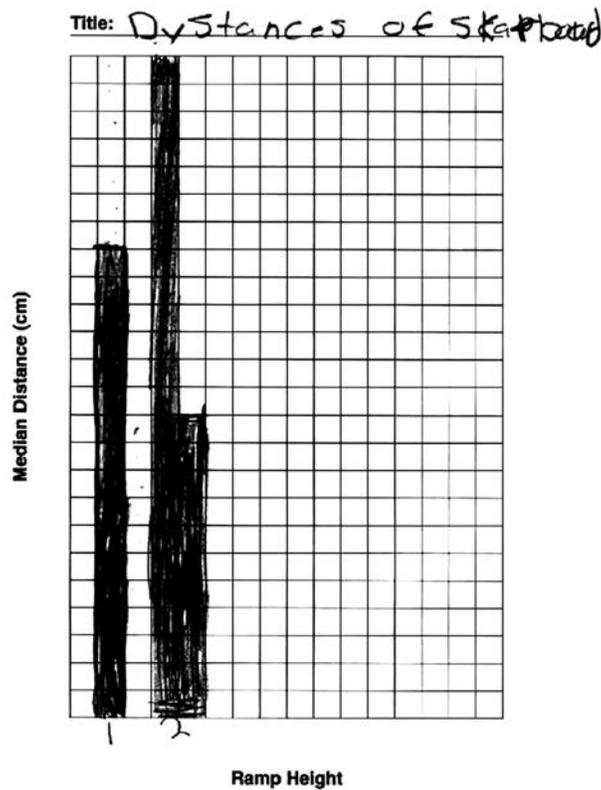
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SCORE POINT 0

Data Table 3: Distance of Toy Skateboard's Roll (cm)

Ramp Height	Median
1 block	17 cm
2 blocks	35 cm

- ① Use the data you recorded in Data Table 3 on page 10 to make a bar graph that shows the **median** distances the toy skateboard rolled at ramp heights of **1 block** and **2 blocks**. Label and title your graph.



There is not enough evidence to demonstrate understanding. While there is a title and there are labels for 1 and 2, there is no scale at all on the y-axis, which makes the median values undefined. The graphing strategy for block 2 also shows a lack of understanding.

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Broad Area of Inquiry: Inquiry Construct 12:	Developing and Evaluating Explanations Use evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis.
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2 Check the box next to the statement that best describes whether your data supported your prediction.

- Yes, the data **supported** my prediction.
- No, the data **did not support** my prediction.

Use evidence from your investigation to explain why your data and observations did or did not support your prediction.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of using evidence to support and justify a conclusion or explain how the evidence refutes the hypothesis. The response explains whether the evidence supports or does not support the prediction.
1	The response demonstrates a limited understanding of using evidence to support and justify a conclusion or explain how the evidence refutes the hypothesis. The overall response is limited.
0	Response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

A general understanding can be exemplified by the following sample response:

I predicted that the skateboard would roll farther from a higher ramp. The data support this because at the 1-block height the rolls were only about 7 cm. At the 2-block height, the rolls were 13 cm or more.

Scoring Notes:

A general response may be exemplified by including the following in the sample response:

- A definite statement of support or nonsupport of the prediction
- Clear and relevant evidence cited from the data collected that supports the position

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SCORE POINT 2

I predict raising the height of the ramp will cause the skateboard to roll farther from the end of the ramp.

because when you raise the height gravity pulls down and more force is pulling down on the skateboard causing it to go faster in which case it will roll farther.

2 Check the box next to the statement that best describes whether your data supported your prediction.

- Yes, the data **supported** my prediction.
- No, the data **did not support** my prediction.

Use evidence from your investigation to explain why your data and observations did or did not support your prediction.

My investigation shows that my data and observations did support my prediction. My data show that the higher you raise the ramp the farther the skateboard like with 1 block it went 18cm but with 2 blocks it went 33cm just like I predicted.

The response demonstrates a general understanding of using evidence to support and justify a conclusion. The response definitively states that the data and observations supported the prediction, and clearly cites relevant evidence to support the position.

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SCORE POINT 1

I predict that it will make a difference
because gravity will pull it down faster.

because

2 Check the box next to the statement that best describes whether your data supported your prediction.

- Yes, the data **supported** my prediction.
- No, the data **did not support** my prediction.

Use evidence from your investigation to explain why your data and observations did or did not support your prediction.

It did support my prediction
because for two blocks it was
59 cm.

The response demonstrates a limited understanding of using evidence to support and justify a conclusion. The response states that the data supported the prediction, but the evidence used in support is incomplete since it only references one of the data points.

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SCORE POINT 0

I predict That it will go farther if they
raise the ramp

because the more hill you have you will
pick up more speed. Than when you go
down to the end of the ramp
you will go farther

2 Check the box next to the statement that best describes whether your data supported your prediction.

- Yes, the data **supported** my prediction.
- No, the data **did not support** my prediction.

Use evidence from your investigation to explain why your data and observations did or did not support your prediction.

I geuss yes because I have rode
my bike befor and when go on
big hills I go farther and when
I go on small hills I go less farther

The response does not demonstrate use of evidence to support and justify a conclusion. The response does not definitively state that the data supported the prediction, and the evidence used in support is completely irrelevant to the task.

**NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

Broad Area of Inquiry: Inquiry Construct 9:	Conducting Investigations Collect sufficient data to study question, hypothesis, or relationships.
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- 3 Explain why it was important to perform three trials in each part of this investigation. Support your reasoning with evidence (data and observations) from your investigation.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of whether the data are sufficient to study the hypothesis. Response explains why it was important to perform three trials in each part of the investigation. Reasoning is supported with evidence from the investigation.
1	The response demonstrates a limited understanding of whether the data are sufficient to study the hypothesis. The overall response is limited.
0	Response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

Scoring Notes:

A general understanding can be exemplified by the following sample response:

Three trials were important to use because the data were not the same in each trial. Three trials allowed us to get the median. Three trials gave us more information. The evidence from the investigation with 1 block was the distance measurements of 7, 6, and 7 cm, and evidence with 2 blocks was 13, 15, and 18 cm.

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SCORE POINT 2

- 3 Explain why it was important to perform three trials in each part of this investigation. Support your reasoning with evidence (data and observations) from your investigation.

It was important to perform three trials in each part because you could get different measurements for each trial. For example, in part A, I got all 10cm. But, for part B I got 25 cm in the first trial, 30 cm in the second trial, and 30 cm in the third trial. Also, if you don't do three trials, you won't get a median.

The response demonstrates a general understanding by explaining why it was important to perform three trials so that you can find a median in case the measurements are different. The reasoning is clearly supported with evidence from the investigation.

SCORE POINT 1

- 3 Explain why it was important to perform three trials in each part of this investigation. Support your reasoning with evidence (data and observations) from your investigation.

To see and recheck if the 2nd or 3rd time is going to be different than the first time like when I did the first one I got 18cm then I got 17cm.

The response demonstrates a limited understanding. The reasoning is somewhat supported with evidence from the investigation, but the support is limited to a couple of data points, and it is unclear where the numbers came from.

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SCORE POINT 0

- 3 Explain why it was important to perform three trials in each part of this investigation. Support your reasoning with evidence (data and observations) from your investigation.

It was important because
you need a median
so you had to
do smallest to biggest

The response is irrelevant to the skill or concept being measured. The response attempts to explain how to find a median, which is irrelevant to this question.

**NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

Broad Area of Inquiry: Inquiry Construct 6:	Planning and Critiquing of Investigations Provide reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation.
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- 4 You built a model of Hillary’s skateboard ramp to test your prediction.

Check the box next to the statement that identifies whether the model was useful for testing the prediction you made.

- The model **was** useful to test the prediction that I made.
- The model **was not** useful to test the prediction that I made.

Give **two** reasons using a model to test your prediction **was** or **was not** more useful than doing the investigation with a real skateboard and ramp would have been.

**NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of how to provide reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation. The response identifies whether the model was useful for testing the prediction that was made. Response includes two reasons using a model to test your prediction was or was not more useful than doing the investigation with a real skateboard and ramp.
1	The response demonstrates a limited understanding of how to provide reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation. The overall response is limited.
0	Response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

A general understanding can be exemplified by the following sample response: The following statement is checked:

- The model **was** useful for testing the prediction that I made.

Two reasons: The model was useful because the skateboard rolled down the ramp like a real skateboard. The blocks also helped raise the ramp higher.

Scoring Notes:

A general response may be exemplified by including the following in the sample response:

- Checked statement that model **was** useful for testing the prediction.
- Reasoning including **any** of the following:
 - o Similarity of model design characteristics (height of blocks, position/length of ramp, correct scale, skateboard similarity, etc.) to real-world characteristics
 - o Reference to data showing significant difference in roll distances at different heights
 - o Ease/simplicity of setup
 - o Allowed investigator to change variables
 - o Made measurement accurate and/or repeatable

Note: Response can also include that model was not useful with appropriate reasoning.

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SCORE POINT 2

4 You built a model of Hillary's skateboard ramp to test your prediction.

Check the box next to the statement that identifies whether the model was useful for testing the prediction you made.

The model **was** useful to test the prediction that I made.

The model **was not** useful to test the prediction that I made.

Give **two** reasons using a model to test your prediction **was** or **was not** more useful than doing the investigation with a real skateboard and ramp would have been.

It would be easier to raise the height of the ramp and easier to measure how far the skateboard went.

The response demonstrates a general understanding by identifying that the model was useful for testing the prediction, and providing two reasons why the model was useful. Ease of setup and ease of measurement are two valid supporting reasons.

NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 1

4 You built a model of Hillary's skateboard ramp to test your prediction.

Check the box next to the statement that identifies whether the model was useful for testing the prediction you made.

The model **was** useful to test the prediction that I made.

The model **was not** useful to test the prediction that I made.

Give **two** reasons using a model to test your prediction **was** or **was not** more useful than doing the investigation with a real skateboard and ramp would have been.

if you used a real skateboard you could
of got hurt

The response demonstrates a limited understanding by identifying that the model was useful for testing the prediction, and providing one reason why the model was useful. Safety is a valid supporting reason, but there is no second reason.

NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 0

4 You built a model of Hillary's skateboard ramp to test your prediction.

Check the box next to the statement that identifies whether the model was useful for testing the prediction you made.

The model **was** useful to test the prediction that I made.

The model **was not** useful to test the prediction that I made.

Give **two** reasons using a model to test your prediction **was** or **was not** more useful than doing the investigation with a real skateboard and ramp would have been.

1. If we did not use the model
I could not see if my prediction was
right.

The response is incorrect. While the appropriate box is checked, there are no valid reasons given as to why the model was useful for testing the prediction.

**NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

Broad Area of Inquiry: Inquiry Construct 13:	Developing and Evaluating Explanations Communicate how scientific knowledge applies to explain results, propose further investigations, or construct and analyze alternative explanations.
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5 Hillary and Andrew want to get more data to help answer their research question.

Identify a different investigation that changes Hillary and Andrew’s model to help Hillary roll farther on her skateboard. Explain why the results of the new investigation will help Hillary roll farther.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of how scientific knowledge applies to explain results, propose further investigations, or construct and analyze alternative explanations. The response identifies a different investigation that changes Hillary and Andrew’s model to help Hillary roll farther on her skateboard and explains why results of the new investigation will help Hillary roll farther.
1	The response demonstrates a limited understanding of how scientific knowledge applies to explain results, propose further investigations, or construct and analyze alternative explanations. The overall response is limited.
0	Response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

A general understanding can be exemplified by the following sample response:

A change that would provide more data is adding another block and measuring the roll distance at a taller height. The roll distance at the taller height would give more data to help answer the research question. This data will help Hillary roll farther because the model investigation would show that she will roll farther on her skateboard.

Scoring Notes:

A general response may be exemplified by including the following in the sample response:

- Description of a new or different procedure that can be reasonably followed
- Identification of more roll distance data that improve upon data limitations, which may include
 - o Reliability
 - o Accuracy
 - o Error
 - o Variable control
- Explanation of how this procedure helps students roll farther on real skateboards.

NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 2

- 5 Hillary and Andrew want to get more data to help answer their research question.

Identify a different investigation that changes Hillary and Andrew's model to help Hillary roll farther on her skateboard. Explain why the results of the new investigation will help Hillary roll farther.

Put more blocks under the ramp so the skateboard will go farther. This will help her because the more steeper and higher it is the more farther you will go.

The response demonstrates a general understanding by identifying a different investigation that changes the model to help Hillary roll farther by putting more blocks under the ramp to increase the height. The response also explains that the steeper the ramp is, the farther she will go.

SCORE POINT 1

- 5 Hillary and Andrew want to get more data to help answer their research question.

Identify a different investigation that changes Hillary and Andrew's model to help Hillary roll farther on her skateboard. Explain why the results of the new investigation will help Hillary roll farther.

Hillary could use 3 blocks in the model instead of 2, giving them more information to look at.

The response demonstrates a limited understanding by identifying a different investigation that changes the model to help Hillary roll farther by putting more blocks under the ramp to increase the height, but the explanation is incomplete.

NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 0

- 5 Hillary and Andrew want to get more data to help answer their research question.

Identify a different investigation that changes Hillary and Andrew's model to help Hillary roll farther on her skateboard. Explain why the results of the new investigation will help Hillary roll farther.

A different investigation would help Hillary would be to instead of measuring centimeters measure feet because it would help Hillary go farther.

The response is totally incorrect. Changing the units of measurement would not alter the experiment.

**NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

Broad Area of Inquiry: Inquiry Construct 1:	Formulating Questions and Hypothesizing Analyze information from observations, research, or experimental data for the purpose of formulating a question, hypothesis, or prediction.
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- 6 Write a **new** research question that could be answered by Hillary and Andrew’s ramp length investigation.

Identify one result from your ramp height investigation that helped you write the new research question.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of how to analyze information from observations, research, or experimental data for the purpose of formulating a question, hypothesis, or prediction. The response includes a new question that tests the new ramp length variable and includes one result from the ramp height investigation that helps form the question.
1	The response demonstrates a limited understanding of how to analyze information from observations, research, or experimental data for the purpose of formulating a question, hypothesis, or prediction. The overall response is limited.
0	Response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

A general understanding can be exemplified by the following sample response:

How does the length of the ramp affect the distance a skateboard rolls from a ramp? The ramp was steeper when the extra block was added. This let the skateboard roll farther. We did not keep the ramp at the same angle.

Scoring Notes:

A general response may be exemplified by including the following in the sample response:

- A question derived from the results/conduct of the test taker’s investigation, which may address any of the following:
 - Distances the toy skateboard travels when additional/alternate variables are controlled/manipulated
 - Changes in controlled or independent variables
 - Possible errors or omissions in procedures

**NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

- One result to tie reasoning of the new question to the results of the test taker's investigation, such as:
 - o Change in measured distances when variables changed
 - o Significant data differences resulting from change in the independent variable
 - o Observations of speed or time spent on the ramp by the skateboard
 - o Other observed phenomena (such as data trends, slowing down of the skateboard, behavior of the ramp)

NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 2

- 6 Write a **new** research question that could be answered by Hillary and Andrew's ramp length investigation.

Will a longer ramp make Hillary's skateboard go farther on the driveway?

Identify one result from your ramp height investigation that helped you write the new research question.

A result from my ramp height investigation that helped me write this question is that raising the ramp helped make the skateboard go farther so I think lengthing the ramp will make the skateboard go farther too.

The response demonstrates a general understanding. The response includes a new question that tests the new ramp length variable and gives a result from the original experiment that helped to form the new question.

NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 1

- 6 Write a **new** research question that could be answered by Hillary and Andrew's ramp length investigation.

Will Hillary's skateboard roll farther if Hillary and Andrew had a longer ramp?

Identify one result from your ramp height investigation that helped you write the new research question.

One result from my ramp height investigation that helped me write the new research question was if Hillary could roll farther with more objects.

The response demonstrates a limited understanding. The response includes a new question that tests the new ramp length variable, but does not provide an appropriate result from the original experiment that helped to form the new question.

NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 0

- 6 Write a **new** research question that could be answered by Hillary and Andrew's ramp length investigation.

How much farther does a skateboard
on a two block ramp roll than a
skateboard on a one block ramp?

Identify one result from your ramp height investigation that helped you write the new research question.

The skateboard on the two block
ramp rolled farther than the
skateboard on the one block ramp.
I wanted to know how much
farther it rolled.

The response is incorrect. No credit is awarded for restating the original experiment.

**NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

Broad Area of Inquiry:	Planning and Critiquing of Investigations
Inquiry Construct 4:	Identify information/evidence that needs to be collected in order to answer the question, hypothesis, prediction.

- 7 Create a data table that Hillary and Andrew could use to collect and record their data from the ramp length investigation.

My data table:

**Ramp Length Investigation Data
Distance Skateboard Rolls (cm)**

				Median

Explain why the data Hillary and Andrew would collect in your data table would allow them to test their prediction.

**NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

Scoring Guide

Score	Description
3	The response demonstrates a thorough understanding of how to identify information/evidence that needs to be collected in order to answer the question, hypothesis, or prediction. The response constructs the data table that would be used to collect and record the data from the investigation and explains how the data collected would allow the students to test their prediction.
2	The response demonstrates a general understanding of how to identify information/evidence that needs to be collected in order to answer the question, hypothesis, or prediction. The overall response is general.
1	The response demonstrates a limited understanding of how to identify information/evidence that needs to be collected in order to answer the question, hypothesis, or prediction. The overall response is limited.
0	Response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

A thorough response may be exemplified by the following sample response:

**Ramp Length Investigation Data
Distance Skateboard Rolls (cm)**

Ramp Length (cm)	Trial 1	Trial 2	Trial 3	Median
15				
20				

The students need to measure the distance that the skateboard rolls off both of the ramps. They want to know if the longer ramp will help them roll farther. They can see if the roll distances are longer or shorter with a longer ramp.

Scoring Notes:

A thorough response may be exemplified by including the following in the sample response:

- Data table with title, labels (Ramp Length; Distance Skateboard Rolls, Trials, units [cm])
- Identification of roll distance or distance the skateboard travels as the dependent variable that needs to be measured
- Reasoning that distance data answer the research question of how ramp length affects roll distance

NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 3

- 7 Create a data table that Hillary and Andrew could use to collect and record their data from the ramp length investigation.

My data table:

Ramp Length Investigation Data
Distance Skateboard Rolls (cm)

ramp length	trial 1	trial 2	trial 3	Median
15 cm				
20 cm				

Explain why the data Hillary and Andrew would collect in your data table would allow them to test their prediction.

The data they collected would allow them to test their prediction because it will help them see if it did go farther with the 20 cm ramp or the 15 cm ramp.

The response demonstrates a thorough understanding of the task. The response includes appropriate labels in the data table, and correctly explains that the data table will allow them to test whether the skateboard will go farther when the ramp length is increased.

NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 2A

- 7 Create a data table that Hillary and Andrew could use to collect and record their data from the ramp length investigation.

My data table:

Ramp Length Investigation Data
Distance Skateboard Rolls (cm)

Ramp Length	trail 1	trail 2	trail 3	Median
15cm				
20cm				

Explain why the data Hillary and Andrew would collect in your data table would allow them to test their prediction.

They are rolling both of the skateboards three times to see if it works better with a longer ramp. Then putting the data down.

The response includes appropriate labels in the data table, and generally explains that the data table will allow them to test whether "it will work better with a longer ramp." The explanation is slightly unclear and does not directly address distance, which makes this response general.

NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 2B

- 7 Create a data table that Hillary and Andrew could use to collect and record their data from the ramp length investigation.

My data table:

Ramp Length Investigation Data
Distance Skateboard Rolls (cm)

Ramp length	Trial 1	Trial 2	Trial 3	Median
Short				
long				

Explain why the data Hillary and Andrew would collect in your data table would allow them to test their prediction.

It would help them because they could see the differences from the short ramp and the long ramp.

The response includes labels in the data table, but the ramp lengths are nonspecific. The response explains that the data table will allow them to test whether "they could see the difference" between ramp lengths, which is a general explanation that does not address distance.

NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 1

- 7 Create a data table that Hillary and Andrew could use to collect and record their data from the ramp length investigation.

My data table:

Ramp Length Investigation Data
Distance Skateboard Rolls (cm)

Ramp Length	Trial 1	Trial 2	Trial 3	Median
15 cm				
20 cm				

Explain why the data Hillary and Andrew would collect in your data table would allow them to test their prediction.

I think the data Hillary and Andrew would collect in my data table would allow them to test their prediction because the table is organized so they can easily see their results,

The response demonstrates a limited understanding. The data table is filled out correctly, but the explanation that the table will be organized is irrelevant.

NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 0

- 7 Create a data table that Hillary and Andrew could use to collect and record their data from the ramp length investigation.

My data table:

Ramp Length Investigation Data
Distance Skateboard Rolls (cm)

Median	Median	Median	Median	Median

Explain why the data Hillary and Andrew would collect in your data table would allow them to test their prediction.

It would allow them to test their prediction because they could right it down.

The response is totally incorrect. The data table is filled out incorrectly and the explanation is irrelevant.

**NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

Broad Area of Inquiry: Inquiry Construct 13:	Developing and Evaluating Explanations Communicate how scientific knowledge applies to explain results, propose further investigations, or construct and analyze alternative explanations.
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- 8 Identify one way to change **the real skateboard ramp** that would make the setup safer. Explain why the change would make the new setup safer.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of communicating how scientific knowledge applies to explain results, propose further investigations, or construct and analyze alternative explanations. The response identifies a change to the real skateboard ramp that would make the setup safer and describes how the change would make the new setup safer.
1	The response demonstrates a limited understanding of communicating how scientific knowledge applies to explain results, propose further investigations, or construct and analyze alternative explanations.
0	Response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

Sample Response:

A general response can be exemplified by the following sample response:

- Reduce the height of the ramp so the students would not roll as far and would stay in the driveway.
- Change the direction of the ramp so it would not point into the street and the students would stay in the driveway.

NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 2

- 8 Identify one way to change **the real skateboard ramp** that would make the setup safer. Explain why the change would make the new setup safer.

They could lower the ramp so when
they lower the ramp, the ramp won't
let them go faster it will slow them down

The response demonstrates a general understanding by identifying that lowering the real skateboard ramp would make the setup safer, and explaining that the change would make the new setup safer by reducing the speed.

SCORE POINT 1

- 8 Identify one way to change **the real skateboard ramp** that would make the setup safer. Explain why the change would make the new setup safer.

to make the ramp shorter.

The response demonstrates a limited understanding by identifying that shortening the real skateboard ramp would make the setup safer, but there is no explanation.

NECAP 2014 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 0

- 8 Identify one way to change **the real skateboard ramp** that would make the setup safer. Explain why the change would make the new setup safer.

They can raise it by one block
and one block only. That way, they
will go farther but not out into
the street. They can raise it by
about 5cm.

The response is totally incorrect. Raising the ramp would not make the experiment safer, and having only one height would not allow them to test a prediction.