



**NEW ENGLAND
COMMON ASSESSMENT PROGRAM**

**Released Items
Support Materials
2008**

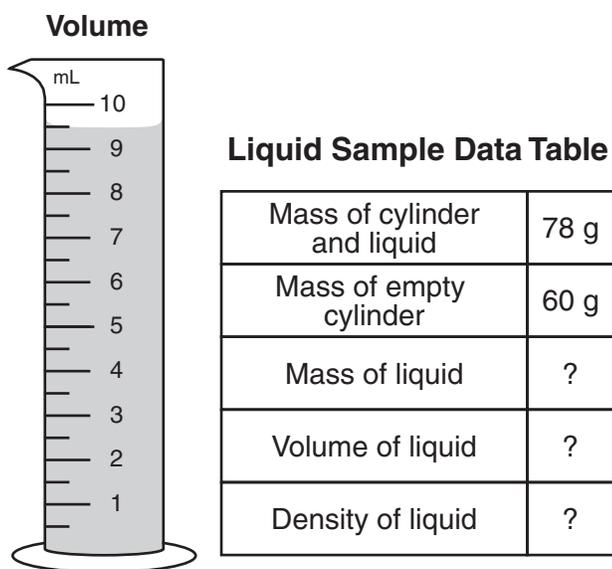
**Grade 8
Science**

NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE

PS1.1 (5–8) Investigate the relationships among mass, volume, and density.

Please use the Formulas on the reference sheet to answer the question.

- 1 A student determined the mass of the graduated cylinder shown below before and after he added the liquid sample. He recorded his measurements in the table shown below.



Based on the information, what are the mass (m), volume (v), and density (D) of the liquid sample?

- A. $m = 138 \text{ g}$ $v = 9.5 \text{ mL}$ $D = 14.5 \text{ g/mL}$
- B. $m = 18 \text{ g}$ $v = 9.5 \text{ mL}$ $D = 1.9 \text{ g/mL}$
- C. $m = 60 \text{ g}$ $v = 10 \text{ mL}$ $D = 6.0 \text{ g/mL}$
- D. $m = 78 \text{ g}$ $v = 10 \text{ mL}$ $D = 7.8 \text{ g/mL}$

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GRADE 8 SCIENCE

PS1.4 (5–8) Represent or explain the relationship between or among energy, molecular motion, temperature, and states of matter.

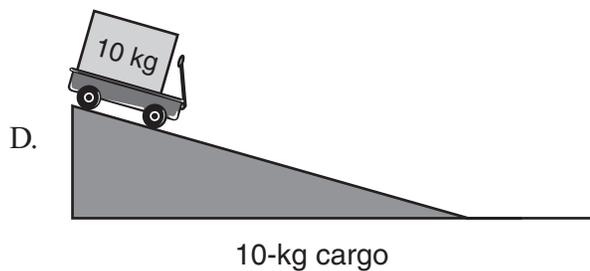
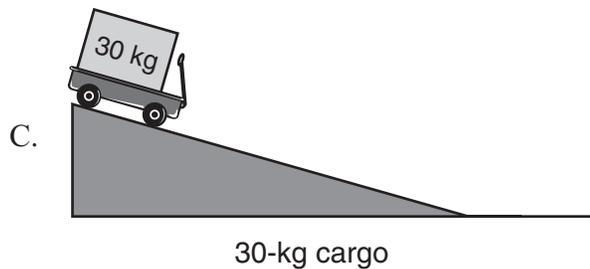
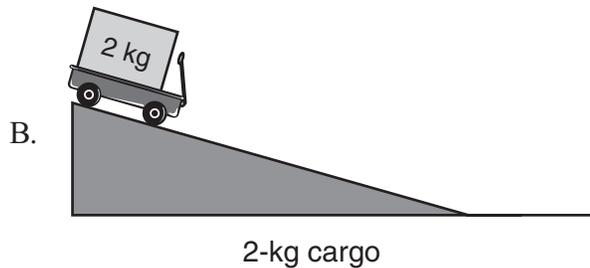
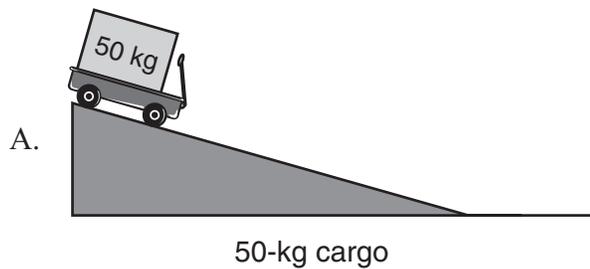
- 2 What happens when water changes from a solid to a liquid to a vapor?
- A. The size of the water molecules increases.
 - B. The size of the water molecules decreases.
 - C. The motion of the water molecules increases.
 - D. The motion of the water molecules decreases.

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GRADE 8 SCIENCE

PS3.8 (5–8) Use data to determine or predict the overall net effect of multiple forces (e.g., friction, gravitational, magnetic) on the position, speed, and direction of motion of objects.

- 3** Four identical wagons with different amounts of cargo are placed at the top of the same ramp.

Which wagon will travel the greatest distance after leaving the ramp?



**NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE**

ESS1.2 (5–8) Explain the processes that cause the cycling of water into and out of the atmosphere and their connections to our planet's weather patterns.

- 4** Which statement **best** describes what happens to water immediately after it evaporates?
- A. Water falls to Earth as rain, snow, or sleet.
 - B. Water vapor condenses into clouds.
 - C. Water lands on Earth as surface water runoff.
 - D. Water vapor rises until it meets cool air.

ESS1.5 (5–8) Using data about a rock's physical characteristics, make and support an inference about the rock's history and connection to rock cycle.

- 5** Schist and quartzite are examples of metamorphic rocks. Which processes are necessary for the formation of metamorphic rocks?
- A. cooling and weathering
 - B. cooling and pressure
 - C. heating and pressure
 - D. weathering and heating

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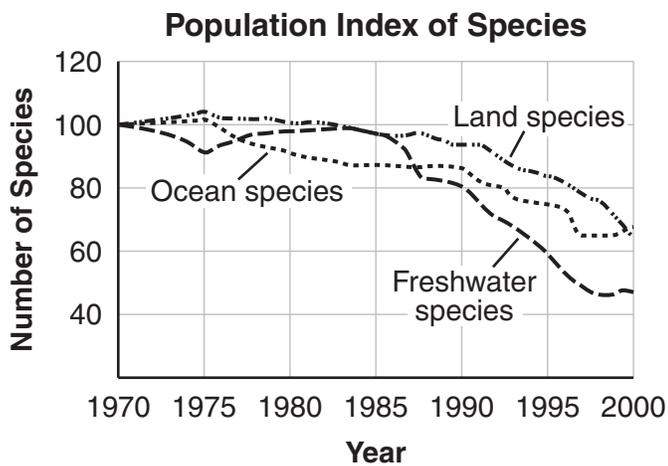
ESS2.7 (5–8) Explain how technological advances have allowed scientists to re-evaluate or extend existing ideas about the solar system.

- 6 Which feature is the **most** important advantage of space-based telescopes?
- A. showing details of planets better than Earth-based telescopes
 - B. detecting forms of radiation Earth-based telescopes cannot detect
 - C. showing much less atmospheric distortion than Earth-based telescopes
 - D. being easier to build than Earth-based telescopes

NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE

LS1.1 (5–8) Using data and observation about the biodiversity of an ecosystem, make predictions or draw conclusions about how the diversity contributes to the stability of the ecosystem.

- 7 In 1970, scientists selected 100 species from each of three environments—ocean, land, and freshwater. The graph below shows how many of these species still existed in the year 2000.



Which statement **best** describes the trend represented by the data?

- A. The ocean species increased in number.
- B. There were more ocean species than land species.
- C. The populations within each freshwater species decreased.
- D. The numbers of land, freshwater, and ocean species all decreased.

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GRADE 8 SCIENCE**

LS1.3 (5–8) Compare and contrast sexual reproduction with asexual reproduction.

- 8 The table below shows characteristics of four different organisms.

Characteristics of Organisms

Characteristics	Organisms			
	W	X	Y	Z
Simple tissues	✓			✓
Complex tissues		✓	✓	
Offspring vary	✓		✓	✓
Offspring identical		✓		
Genetic information from two parents	✓		✓	✓
Genetic information from one parent		✓		

Which organism is the product of asexual reproduction?

- A. Organism W
- B. Organism X
- C. Organism Y
- D. Organism Z

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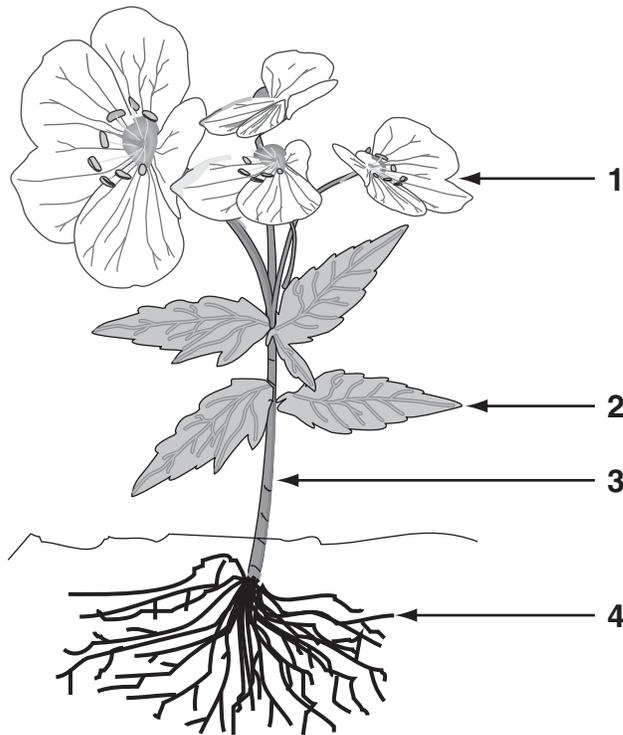
LS2.6 (5–8) Given a scenario, trace the flow of energy through an ecosystem, beginning with the sun, through organisms in the food web, and into the environment (includes photosynthesis and respiration).

- 9 Plants undergo both photosynthesis and respiration. Which statement correctly compares photosynthesis with respiration?
- A. Photosynthesis releases stored energy, while respiration stores energy.
 - B. Photosynthesis stores energy, while respiration releases stored energy.
 - C. Neither photosynthesis nor respiration require water.
 - D. Both photosynthesis and respiration require sunlight.

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LS1.2 (5–8) Describe or compare how different organisms have mechanisms that work in a coordinated way to obtain energy, grow, move, respond, provide defense, enable reproduction, or maintain internal balance (e.g., cells, tissues, organs, and systems).

10 The diagram below shows a flowering plant.



- Identify and explain the function of **each** numbered plant organ in the diagram.
- Explain how any **two** numbered plant organs work together to help the plant survive.

**NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE**

Scoring Guide

Score	Description
4	Response demonstrates a thorough understanding of plant organs. Response identifies and describes each numbered plant organ and explains how any two organs work together. The response has no errors or omissions.
3	Response demonstrates a general understanding of plant organs. Three parts of the question are correctly answered.
2	Response demonstrates a limited understanding of plant organs. Two parts of the question are correctly answered.
1	Response demonstrates a minimal understanding of plant organs. One part of the question is correctly answered.
0	Response is incorrect or contains some work that is irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

Part a:

- Flower (1)—A flower is the reproductive structure found in flowering plants. The flower structure contains the plant’s reproductive organs, and its function is to produce seeds.
- Leaf (2)—A leaf specializes in photosynthesis. It has cells containing chloroplasts that convert light energy into sugar or food. Leaves are also the sites in most plants where respiration and transpiration take place. Leaves can also store food and water.
- Stem (3)—In vascular plants, stems support and elevate leaves, flowers, and fruits. They keep leaves in the light. Stems allow the transport of fluids and nutrients between roots and shoots. Stems can also store nutrients.
- Roots (4)—In vascular plants, the root is the organ of a plant body that typically lies below the surface of the soil. It bears no leaves and, therefore, also lacks nodes. The two major functions of roots are a) absorbing water and nutrients and b) anchoring the plant to the ground. Roots often function in the storage of food.

Note: If the response uses the term “petal” instead of “flower,” it is acceptable provided the response includes a function of the petal.

Part b: An accurate description includes how any two numbered plant organs work together for the survival of the plant.

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SCORE POINT 4

- 10 a. 1- flowers produce pollen for bees/ insects to help with reproduction
2- leaves absorb sunlight to help with photosynthesis
3- stem supports the flower
4- roots take in minerals and water
- b. The roots absorb water and nutrients, and the stem has tubes leading to the leaves to provide nutrients, so the stem works with the roots to transport water and nutrients.

For part (a), the response identifies all four plant organs and correctly explains a function of each. For part (b), the response discusses how the roots and stems work together to transport water and nutrients from the soil to the rest of the plant. The response is clear, correct, and complete.

- 10
- a) 1. Flower - Attract organisms like bees.
2. Leaf - Absorb sunlight.
3. Stem - Carry nutrients throughout plant.
4. Roots - To absorb nutrients from soil.
- b) The roots get nutrients to the stem and the stem allows them to be carried throughout the plant.

For part (a), the response correctly identifies all four plant organs and offers general explanations of the function of each. There is no discussion of water transport for the stems and roots or photosynthesis for the leaves. The response for part (b) is also considered general because it offers no discussion of water transport. The response receives a score of 3 because of its general nature.

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SCORE POINT 2

10 A
1 flower
2 leaves
3 stem
4 roots

B The roots and stem bring water up to the leaves for photosynthesis.

For part (a), the response correctly identifies all four plant organs but explains none of their functions. For part (b), the response discusses water transport but not nutrient transport from the soil. This response is limited, so it receives a score of 2.

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SCORE POINT 1

10

(A) 1 is the flower 2 is the leaf 3 is the stem and 4 is the root

(B) 4 cannot 3 because if it didn't have 4 or 3 it wouldn't survive at all.

For part (a), the response correctly identifies all four plant organs but does not discuss what their functions are. For part (b), the response receives no credit. The response is minimal and receives a score of 1.

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SCORE POINT 0

10

A

1. Mouth of the flower for food
2. Support and Balance
3. BODY
4. Stomach

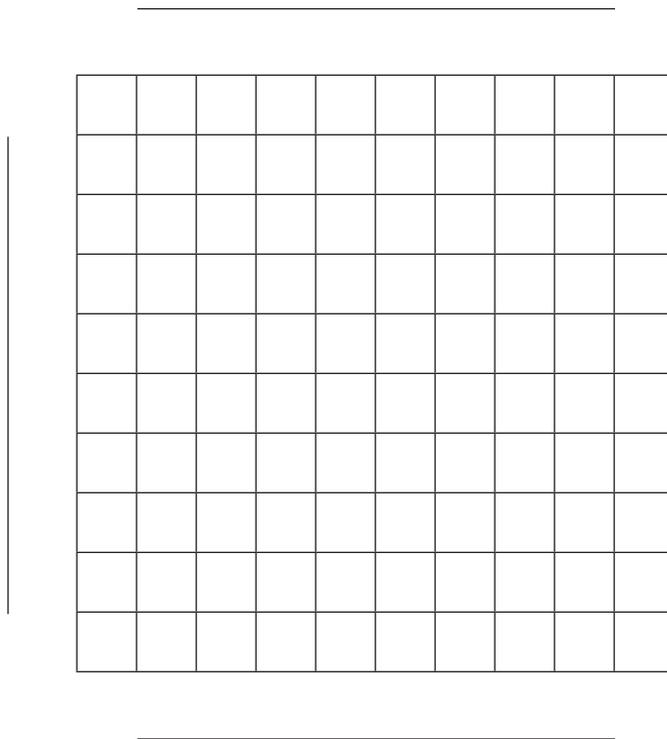
Both parts of the response are incorrect, so it receives a score of 0.

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GRADE 8 SCIENCE

Broad Area of Inquiry: Conducting Investigations

INQ3.8 (5–8) Use accepted methods for organizing, representing, and manipulating data (compare data; display data).

- 11 Use the data you collected to make a graph that shows the relationship between the average height of the sand and the elapsed time. Be sure to clearly label each axis and include a title.



**NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE**

Scoring Guide

Score	Description
3	Response correctly labels the axes and titles the graph, uses an appropriate scale, and shows correct data sets by presenting the data from the table. Averages must be graphed. The response includes no errors or omissions. The response must include units (mm) and time (years). The independent variable is graphed on the <i>x</i> -axis and the dependent variable is graphed on the <i>y</i> -axis.
2	Response shows correct data sets by presenting the data from the table. Other elements of the graph may be missing or incorrect (titles, labels, units, scale appropriate for range, keys or symbols).
1	Response shows incorrect data sets. Some elements of the graph are correct, but others may be missing or incorrect.
0	Response is incorrect or contains some work that is irrelevant to the skill or concept being measured.
Blank	No response

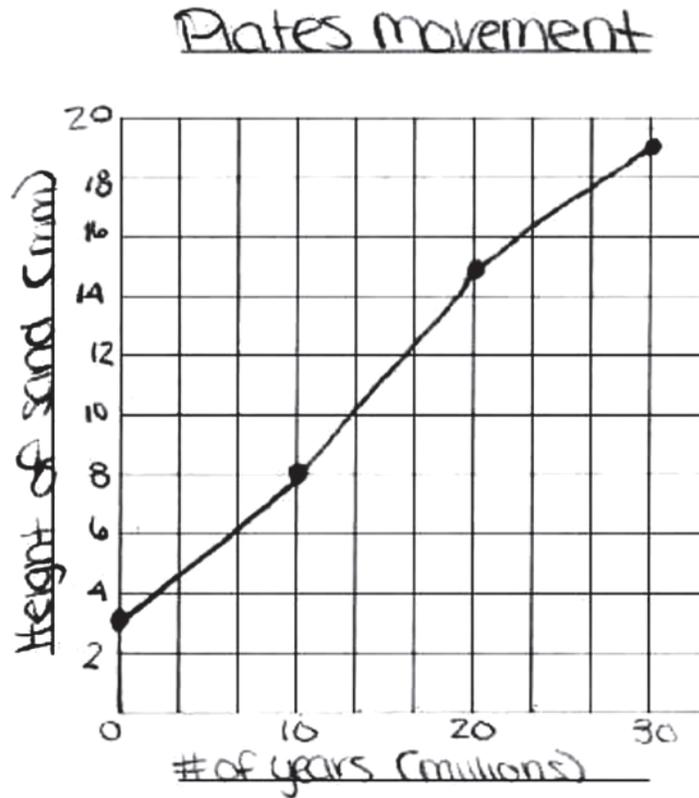
Training Notes:

- Data sets do not have to be connected.
- Points on the graph do not need to be connected.
- The graph is not considered to have a correct data set if the data points do not match the data in the table or if there is not a scale for *x* (an inappropriate scale would be considered a normal incorrect element). These errors prevent an understanding of the presented data points. The highest score under these conditions is a 1. If it is clear that the data points are in the correct position—follow the order presented in the table—on the *x*-axis and the scale is appropriate but unmarked, then these are considered incorrect elements.
- If the response graphs only the individual trials, then the response can only receive a maximum of 2 points.
- If the response flips the *x*-axis and *y*-axis but everything else is correct, the response can receive a maximum of 2 points.

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SCORE POINT 3

- 11 Use the data you collected to make a graph that shows the relationship between the average height of the sand and the elapsed time. Be sure to clearly label each axis and include a title.



All elements of the graph are correct. The data set is correctly graphed based on the data in the table. The graph has an appropriate title, appropriate axes labels with units, and appropriate scales.

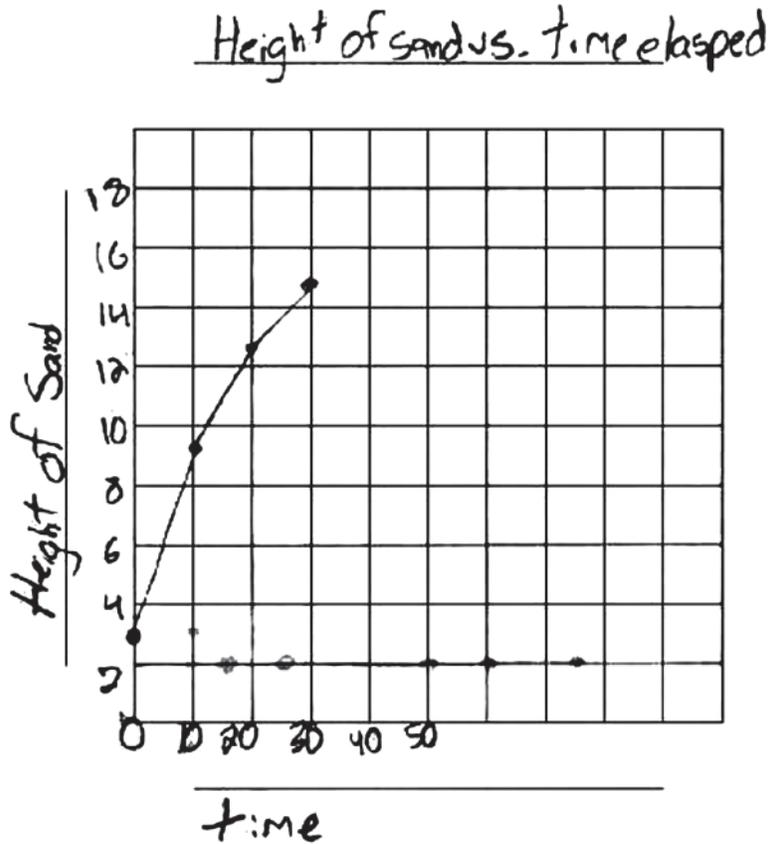
Note: The points on the graph do not need to be connected to receive a score of 3.

Years	0	10 million	20 million	30 million
Trial 1	3 mm	5 mm	15 mm	17 mm
Trial 2	4 mm	10 mm	15 mm	20 mm
Trial 3	3 mm	9 mm	18 mm	19 mm
Average	3.3 mm	8 mm	15 mm	18.7 mm

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GRADE 8 SCIENCE

SCORE POINT 2

- 11 Use the data you collected to make a graph that shows the relationship between the average height of the sand and the elapsed time. Be sure to clearly label each axis and include a title.



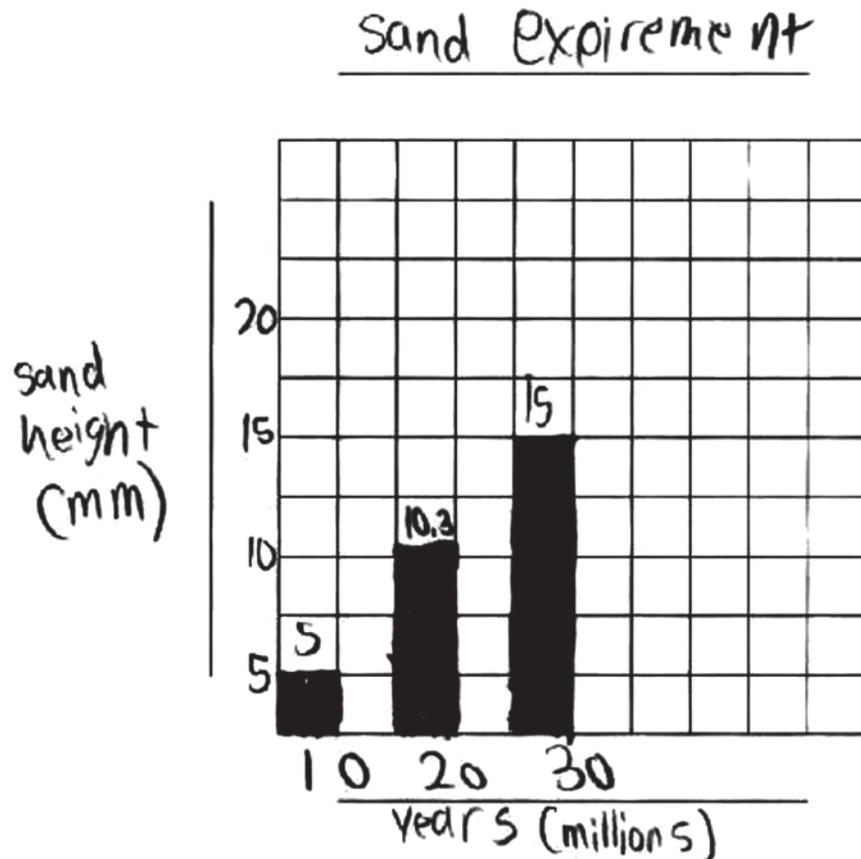
The data set is correctly graphed, and the graph includes an appropriate title and appropriate scales. The axes are labeled. However, the labels do not include units of measure. The labels must include units in order for the response to receive a score of 3.

Years	0	10 million	20 million	30 million
Trial 1	3mm	10mm	12mm	15mm
Trial 2	5mm	10mm	14mm	16mm
Trial 3	2mm	8mm	11mm	15mm
Average	3.3mm	9.3mm	12.3mm	15.3mm

NECAP 2008 RELEASED ITEMS
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SCORE POINT 1

- 11 Use the data you collected to make a graph that shows the relationship between the average height of the sand and the elapsed time. Be sure to clearly label each axis and include a title.



The data set is incorrectly graphed. The graph omits 0 years and shifts 5 and 10.3 mm upward, cutting off the 11 mm measurement. The axes are labeled with units, but the scales are a little off. On the y-axis, the range 0–5 mm consists of only one box while other 5 mm intervals consist of two boxes. The x-axis has the same interval problem: the range 0–10 million years consists of only one box while other 10-million-year periods consist of two boxes. “Sand Experiment” is a weak title and receives a minor deduction. The response receives a score of 1 because it includes an attempt to make a graph and a few correct elements.

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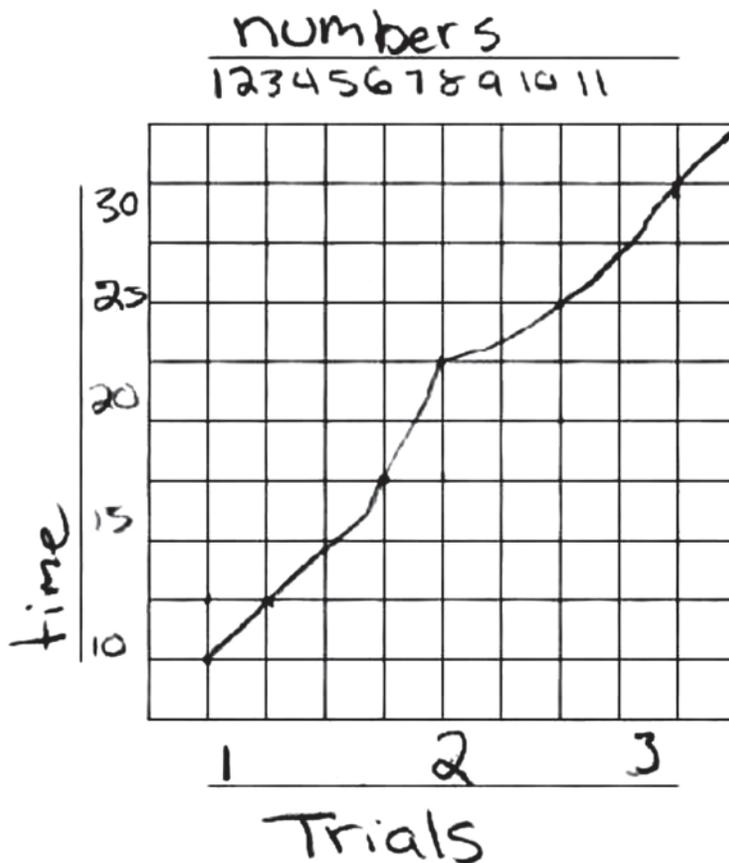
SCORE POINT 1 (CONTINUED)

Years	0	10 million	20 million	30 million
Trial 1	5	11	6	18
Trial 2	5	10	15	17
Trial 3	5	10	12	10
Average	5	10.3	11	15

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GRADE 8 SCIENCE

SCORE POINT 0

- 11 Use the data you collected to make a graph that shows the relationship between the average height of the sand and the elapsed time. Be sure to clearly label each axis and include a title.



The graph is set up incorrectly. Time is plotted on the y-axis, and the sand height in each trial is plotted on the x-axis. The points on the graph do not seem to be based on the data in the table. The title is irrelevant. The response includes no correct work, so it receives a score of 0.

Years	0	10 million	20 million	30 million
Trial 1	1mm	7mm	7mm	10mm
Trial 2	1mm	5mm	7mm	10mm
Trial 3	1mm	6mm	8mm	11mm
Average	1	6	7.5	10.5

**NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE**

Broad Area of Inquiry: Conducting Investigations

INQ3.7 (5–8) Follow procedures for collecting and recording qualitative or quantitative data, using equipment or measurement devices accurately (DOK 1 – use tools; routine procedure; DOK 2 – follow multi-step procedures; make observations).

12 Use your data to describe what happened to the sand in the investigation.

For 10 Million Years:

For 20 Million Years:

For 30 Million Years:

Scoring Guide

Score	Description
3	Response provides a clear and correct description and supporting data (quantitative or qualitative) of what happened to the sand in each of the three time spans. Diagrams must be labeled if used.
2	Response provides a general description and/or supporting data (quantitative or qualitative) of what happened to the sand in a minimum of two time spans. The response may include errors or omissions.
1	Response provides a general description and/or supporting data (quantitative or qualitative) of what happened to the sand in a minimum of two time spans. The response may include errors or omissions.
0	Response is incorrect or contains some work that is irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

- The expectation is that the response should show that as the time span increased, so did the height of sand in the experiment. BUT, the response should reflect the data presented in the table and graph.

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GRADE 8 SCIENCE

SCORE POINT 3

12 Use your data to describe what happened to the sand in the investigation.

For 10 Million Years:

For 10 million years, we found out that the average came out to be 6mm. The sand became a little higher.

For 20 Million Years:

For 20 million years, we found out that the height of the sand was most frequently 10, the average came out to be 10.33mm. The sand got much higher.

For 30 Million Years:

Finally, for the 30^m years, we found out that the height got much higher than all the trials. The average turned out to be 13.6mm.

The response correctly describes what happens to the sand during each time period based on the data in the table.

Years	0	10 million	20 million	30 million
Trial 1	2mm	5mm	10mm	14mm
Trial 2	3mm	6mm	10mm	13mm
Trial 3	3mm	7mm	11mm	14mm
Average	2.66mm	6mm	10.33	13.6mm

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SCORE POINT 2 (EXAMPLE A)

12 Use your data to describe what happened to the sand in the investigation.

For 10 Million Years:

the sand rose from 3.3 mm to 8 mm in
10 million years

For 20 Million Years:

the sand rose from 3.3 mm to 10.3 mm in
20 million years

For 30 Million Years:

the sand rose from 3.3 mm to 11.3 mm in
30 million years

The response restates the data collected for each time period but does not describe in detail what happens to the sand during each time period. The descriptions refer to the initial height of the sand but are not totally clear about how the height of the sand changes over time.

Years	0	10 million	20 million	30 million
Trial 1	5	7	11	12
Trial 2	3	8	10	11
Trial 3	2	9	10	11
Average	3.3	8	10.3	11.3

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GRADE 8 SCIENCE

SCORE POINT 2 (EXAMPLE B)

12 Use your data to describe what happened to the sand in the investigation.

For 10 Million Years:

The SAND COLLIDES AND RISES
TO A NEW LAND LEVEL

For 20 Million Years:

The SAND KEEPS COLLIDING &
RISING

For 30 Million Years:

It gets TO IT'S HIGHEST POINT
LIKE A LITTLE MOUNTAIN

The response describes what happens to the sand over time based on observations. However, the response never refers to data collected in the experiment, which is required to receive score of 3.

Years	0	10 million	20 million	30 million
Trial 1	2 MM	5 MM	10 MM	11 MM
Trial 2	3 MM	6 MM	9 MM	12 MM
Trial 3	2 MM	5 MM	9 MM	12 MM
Average	2.33 MM	5.33 MM	9.33 MM	11.66

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SCORE POINT 1 (EXAMPLE A)

12 Use your data to describe what happened to the sand in the investigation.

For 10 Million Years:

It decreased by one, then increased by three.

For 20 Million Years:

It decreased, then increased by one

For 30 Million Years:

Stayed the same. It decreased by one, then

The response receives minimal credit because it describes only what happens to the height of the sand during each time period (e.g., the height of the sand was 5 mm in Trial 1 for 10 million years, the height of the sand decreased 1–4 mm in Trial 2, and the height of the sand increased 3–7 mm in Trial 3). The response receives a score of 1 because, although it misses the point of the question, it describes the data in the table and is not totally incorrect or irrelevant.

Years	0	10 million	20 million	30 million
Trial 1	2	5	10	15
Trial 2	1	4	9	14
Trial 3	2	7	10	14
Average	1.6	5.3	9.6	14.3

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SCORE POINT 1 (EXAMPLE B)

12 Use your data to describe what happened to the sand in the investigation.

For 10 Million Years:

The sand got higher

For 20 Million Years:

It went up even higher

For 30 Million Years:

It was up at his highest

The response receives a score of 1 for offering a minimal observation of what happens to the height of the sand over time.

Years	0	10 million	20 million	30 million
Trial 1	1/2mm	1/4mm	3/4mm	10mm
Trial 2				
Trial 3				
Average				

**NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE**

SCORE POINT 0

12 Use your data to describe what happened to the sand in the investigation.

For 10 Million Years:

Trial 2.8
Trial 2.8
Trial 3.7

For 20 Million Years:

1 11
2 10
3 9

For 30 Million Years:

1 13
2 11
3 13

The response receives no credit because the student has simply copied the data in the table. The response does not demonstrate an understanding of the experiment.

Years	0	10 million	20 million	30 million
Trial 1	4	8	11	13
Trial 2	3	8	10	11
Trial 3	3	7	9	13
Average	3	7	10	12

**NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE**

Broad Area of Inquiry: Developing and Evaluating Explanations

INQ4.12 (5–8) Use evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis.

- 13 a. Look at your prediction on page 4 of your Task Booklet. Did the results of your investigation support your prediction about what would happen to the sand when the Eurasian and Indian Plates moved toward each other?
- Yes
- No
- b. Explain how your data and observations did or did not support your prediction.

Scoring Guide

Score	Description
2	Response clearly explains how the evidence/data did or did not support a prediction. The response cannot simply restate the prediction; the response needs to include results/evidence.
1	Response is minimal or provides only a partial explanation as to how the evidence/observations did or did not support the prediction.
0	Response is incorrect or contains some work that is irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

- Response must have a position on whether the data supports the prediction or it does not receive any credit.
- Response reflects data collected and includes a checked answer (Yes or No).
- If the data connects to the prediction but the response argues it does not—only 1 point is awarded (the reverse would also receive one point).
- If the response includes only a list of data *or* only a discussion of the prediction, no points are awarded.

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GRADE 8 SCIENCE

SCORE POINT 2

- 13 a. Look at your prediction on page 4 of your Task Booklet. Did the results of your investigation support your prediction about what would happen to the sand when the Eurasian and Indian Plates moved toward each other?

Yes

No

- b. Explain how your data and observations did or did not support your prediction.

The data supported my prediction because I said a mountain range would form and the data showed the land rising more and more as they continued to collide.

The response takes a position for part (a) and explains how the trend in the data supports the prediction for part (b). The response clearly describes the trend in the data (the height of the sand rises more and more).

Trial 1	4mm	8mm	10mm	13mm
Trial 2	0mm	4mm	6mm	9mm
Trial 3	0mm	5mm	7mm	10mm
Average	1.33	5.66	7.66	10.66

**NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE**

SCORE POINT 1 (EXAMPLE A)

- 13 a. Look at your prediction on page 4 of your Task Booklet. Did the results of your investigation support your prediction about what would happen to the sand when the Eurasian and Indian Plates moved toward each other?

Yes

No

- b. Explain how your data and observations did or did not support your prediction.

My prediction was that the sand was going to rise and it did.

The response takes a position for part (a) and then partially describes how the trend in the data supports the prediction for part (b). The response does not describe how the height of the sand changes over time; it simply states that the height of the sand rose. This gives the impression of a singular event rather than a gradual process.

Years	0	10 million	20 million	30 million
Trial 1	3 mm	10 mm	14 mm	16 mm
Trial 2	5 mm	11 mm	14 mm	16 mm
Trial 3	5 mm	11 mm	14 mm	16 mm
Average	4 ¹ / ₃ mm	10 ² / ₃ mm	14 mm	16 mm

**NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE**

SCORE POINT 1 (EXAMPLE B)

- 13 a. Look at your prediction on page 4 of your Task Booklet. Did the results of your investigation support your prediction about what would happen to the sand when the Eurasian and Indian Plates moved toward each other?

Yes

No

- b. Explain how your data and observations did or did not support your prediction.

My prediction was that the plates will decrease when years go by. But the low answer was that it increase.

The response takes a position for part (a) and offers a partial explanation for part (b). The response states that the plates increased but does not state how they increased (i.e., "increased *in height*").

Years	0	10 million	20 million	30 million
Trial 1	0	29	60	86
Trial 2	0	0	30	60
Trial 3	0	0	0	29
Average	0	29	30	58.3

**NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE**

SCORE POINT 0

- 13 a. Look at your prediction on page 4 of your Task Booklet. Did the results of your investigation support your prediction about what would happen to the sand when the Eurasian and Indian Plates moved toward each other?

Yes

No

- b. Explain how your data and observations did or did not support your prediction.

I was totally wrong on my hypothesis.

The response takes a position for part (a) but does not offer an explanation for part (b). The response for part (b) does not offer any information that shows how the conclusion was reached. The response receives no credit for taking a position but not offering an explanation.

Years	0	10 million	20 million	30 million
Trial 1	2 mm	5 mm	10 mm	15 mm
Trial 2	2 mm	7½ mm	10 mm	10 mm
Trial 3	2 mm	5 mm	7 mm	10 mm
Average	2 mm	5.83 mm	9 mm	11.6̄ mm

**NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE**

Broad Area of Inquiry: Planning and Critiquing of Investigations

INQ2.6 (5–8) Provide reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation.

- 14 a. Describe **two** ways this model represents actual Earth processes.
- b. Describe **two** ways the model is different from actual Earth processes.

Scoring Guide

Score	Description
2	Response clearly describes two ways the model represents actual Earth processes and two ways the model is different from actual Earth processes.
1	Response describes one or two ways the model represents actual Earth processes and/or one or two ways the model is different from actual Earth processes. Response may contain errors or omissions.
0	Response is incorrect or contains some work that is irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

For a score of 2, responses must be valid in terms of scientific reasoning.

Some ways that the model does represent actual Earth processes:

- When the paper marked as the Indian Plate moves farther under the paper marked as the Eurasian Plate, the process mimics subduction.
- The buildup of sand emulates the creation of mountains.
- Other appropriate responses can also be accepted.

Some ways that the model does not represent actual Earth processes:

- At subduction zones, the force does not come from above or alongside but from underneath.
- The material in the model is not as varied as the crust of Earth and the size is more uniform. This means that the model does not have the varying levels of resistance found in the crust during application of force between the plates.
- Other appropriate responses can also be accepted.

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SCORE POINT 2

- 14 a. Describe **two** ways this model represents actual Earth processes.

Two ways that this model represents the actual processes of Earth are one plate sliding under another and the formation of mountains. To do this experiment, the Indian plate had to slide under the Eurasian one, which happens in real life. Sand also builds up in convergent boundaries like this, just like our model, and makes mountains.

- b. Describe **two** ways the model is different from actual Earth processes.

Two ways the model is different from actual Earth processes is scale and time. In real life, these plates are huge and make mountains, not piles of sand. It also takes millions of years for this to happen, not seconds.

The response clearly describes two similarities between the model and actual Earth processes (one plate sliding under another, mountains forming) and two differences between the model and actual Earth processes (scale, time). The response describes each point. In actual Earth processes, the Indian Plate subducts the Eurasian Plate, sand builds up at convergent boundaries to form mountains, and bigger mountains form. It takes millions of years rather than seconds for these processes to occur. All parts of the response are clear, correct, and complete, so the response receives a score of 2.

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GRADE 8 SCIENCE

SCORE POINT 1

14 a. Describe **two** ways this model represents actual Earth processes.

1. The plates moving
2. The way the plates move and how it actually makes a mountain.

b. Describe **two** ways the model is different from actual Earth processes.

1. The earth isn't paper
2. The earth isn't all just sand. So instead of making a mountain sometimes it makes a valley.

For part (a), the description "the plates moving" is not clear enough to receive credit, but the response receives credit for discussing mountain formation. The response for part (b) is weak. The first point of the response is valid but not overly scientific. Although it is true that Earth is not just all sand, the formation of a mountain and the formation of a valley are different processes. The process of erosion, not a subducting plate, causes a valley to form. A response that offers one, two, or three valid points receives a score of 1. This response offers one valid point and two weak points, one of which contains a misconception, so the response receives a score of 1.

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GRADE 8 SCIENCE

SCORE POINT 0

- 14 a. Describe **two** ways this model represents actual Earth processes.

The water moves up and down.

- b. Describe **two** ways the model is different from actual Earth processes.

Because sand and water are not the same thing.

The responses to parts (a) and (b) are irrelevant to the task, so the response receives a score of 0.

**NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE**

Broad Area of Inquiry: Planning and Critiquing of Investigations

INQ2.6 (5–8) Provide reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation.

- 15 Explain why it is necessary to use models to study the interactions between the plates in Earth's crust.

Scoring Guide

Score	Description
2	Response clearly explains why it is necessary to use models to study the interactions between the plates in Earth's crust.
1	Response partially explains why it is necessary to use models to study the interactions between plates in Earth's crust. Response may contain errors or omissions.
0	Response is incorrect or contains some work that is irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

In order for the response to receive full credit, it must show relevant uses of models, such as the following:

- impossible to study plates in a "lab" setting
- relate the scale of the model in terms of magnitude to the actual in terms of energy and time

NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE

SCORE POINT 2

- 15 Explain why it is necessary to use models to study the interactions between the plates in Earth's crust.

It is necessary to use models to study the interactions between the plates in Earth's crust because we cannot watch them in life. The plates are too vast and the time passes so slowly to witness changes in the plates in one life time.

The response demonstrates a clear understanding of the importance of using small-scale models to investigate the interactions between the plates in Earth's crust. The response acknowledges that the geological time scale is much larger than the human time scale and that plates are too large for humans to study the interactions among them.

SCORE POINT 1 (EXAMPLE A)

- 15 Explain why it is necessary to use models to study the interactions between the plates in Earth's crust.

If you used the actual earth it would take much longer.

The response does acknowledge that Earth's plates "take much longer" than plates in a model do but does not explain why the geological time scale makes it necessary to use models. The response also does not take the size of actual plates into account. The response is limited and receives a score of 1.

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SCORE POINT 1 (EXAMPLE B)

- 15 Explain why it is necessary to use models to study the interactions between the plates in Earth's crust.

Models are used to see things in small portions rather than big portions that can get out of hand.

The response gives the size of actual plates as a reason that models are important to use but does not provide a detailed explanation. The response does not address the time scale and how much longer it takes for plates in Earth's crust to interact. The response shows limited understanding and receives a score of 1.

SCORE POINT 0

- 15 Explain why it is necessary to use models to study the interactions between the plates in Earth's crust.

It's necessary because, that's how all of the mountains came to be.

The response does not address the reason it is necessary to use models to investigate the interactions between Earth's plates. The response gives a possible reason for studying these interactions but does not address the necessity of using models to do so.

**NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE**

Broad Area of Inquiry: Developing and Evaluating Explanations

INQ4.13 (5–8) Communicate how scientific knowledge applies to explain results, propose further investigations, or construct and analyze alternative explanations.

- 16** The science class learned that Earth’s plates can interact in many ways. Describe how you could use a model to investigate another type of interaction between the plates. (Remember: Scientists think plates can move away from, over, under, and next to one another.)

Scoring Guide

Score	Description
3	Response provides a clear description of how another plate model would work.
2	Response provides a partial description of how another plate model would work. Response may contain errors or omissions.
1	Response provides a minimal description of how another plate model would work. Response may contain errors or omissions.
0	Response is incorrect or contains some work that is irrelevant to the skill or concept being measured.
Blank	No response

NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE

SCORE POINT 3

- 16 The science class learned that Earth's plates can interact in many ways. Describe how you could use a model to investigate another type of interaction between the plates. (Remember: Scientists think plates can move away from, over, under, and next to one another.)

You could put two peices of paper (representing tectonic plates) and put them over a bowl and put sand on top of it, and pull the peices of paper away from each other and the sand will fall into the bowl, creating a canyon which shows what happens when plates move away from each other

The response provides a clear investigation design that could be used to investigate another type of plate interaction. It is most important that a response demonstrate a student's ability to design an investigation; therefore, even though this response incorrectly states that a canyon would form from two plates moving apart, it receives a score of 3 because it demonstrates the student's ability to design a testable investigation.

SCORE POINT 2

- 16 The science class learned that Earth's plates can interact in many ways. Describe how you could use a model to investigate another type of interaction between the plates. (Remember: Scientists think plates can move away from, over, under, and next to one another.)

you could take alot of sand pile it up and move two "plates" away from eachother and see what it forms.

The response offers a partial suggestion of how a model could be used to investigate another type of plate interaction. However, the response does not provide enough details about setting up another investigation.

NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE

SCORE POINT 1

- 16 The science class learned that Earth's plates can interact in many ways. Describe how you could use a model to investigate another type of interaction between the plates. (Remember: Scientists think plates can move away from, over, under, and next to one another.)

model we could use is the same
thing except moving the plate
away from the other plate

The response provides a minimal idea of how a model could be used to investigate another type of plate interaction but gives only one step (moving a model plate away from another model plate) for a possible investigation. The response provides no details about setting up the investigation, and it does not mention sand or any other material that could be placed on the model plates to obtain results.

SCORE POINT 0

- 16 The science class learned that Earth's plates can interact in many ways. Describe how you could use a model to investigate another type of interaction between the plates. (Remember: Scientists think plates can move away from, over, under, and next to one another.)

The science class learned that the earth's
plates can interact by how they
move.

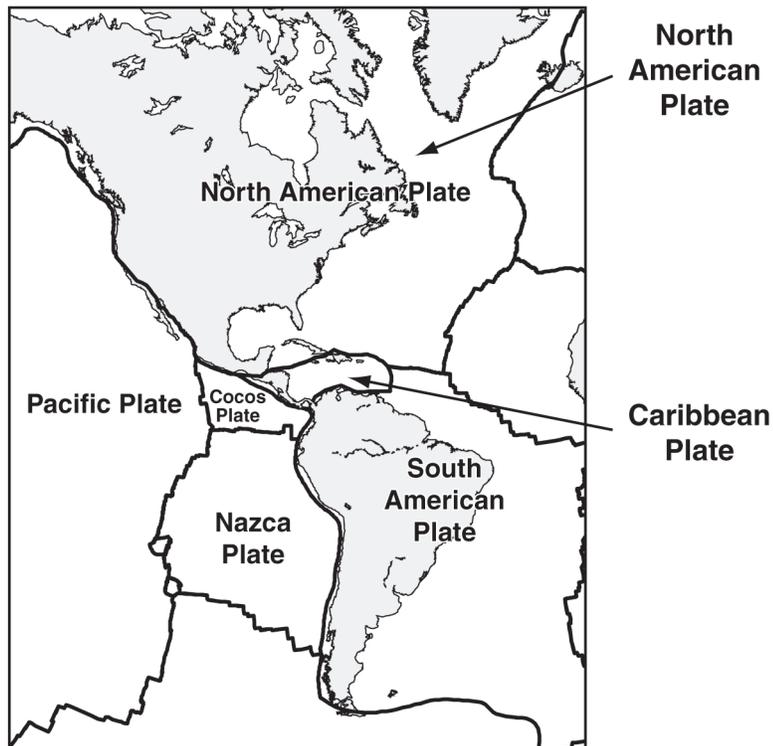
The response offers no suggestions for setting up another experiment to investigate a different type of plate movement. The response is irrelevant to the prompt and receives a score of 0.

NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE

Broad Area of Inquiry: Developing and Evaluating Explanations

INQ4.13 (5–8) Communicate how scientific knowledge applies to explain results, propose further investigations, or construct and analyze alternative explanations.

- 17 Use what you observed in this investigation and what you know about plate movements to predict what would happen over millions of years if the Caribbean Plate and North American Plate were to collide.



**NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE**

Scoring Guide

Score	Description
3	Response provides a prediction of what would happen over millions of years if the Caribbean Plate and North American Plate were to collide. Response is supported with relevant and specific details. Response specifically references the map and/or the investigation. Response references plate boundaries and landform changes.
2	Response provides a prediction of what would happen over millions of years if the Caribbean Plate and North American Plate were to collide. Response is supported with limited details. Response may reference either the map or the investigation. Response references either plate boundaries or landform changes. Response may contain an error or an omission.
1	Response provides a minimal prediction of what would happen over millions of years if the Caribbean Plate and North American Plate were to collide. Response may or may not reference plate boundaries or landform changes. Response may contain errors or omissions.
0	Response is incorrect or contains some work that is irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

In order to receive full credit for this item, the response must

- infer that a mountain range (or a trench) will be formed by the collision (or subduction) of the plates.
- include an awareness of the scale of the model and the scale of time.

The response may also include a

- comparison between what the student is seeing here and what is occurring at other similar plate boundaries.

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SCORE POINT 3

17

The land that is on the North American Plate and the land that is on the Caribbean Plate that is next to each other would push together with causes stress, then the land will be forced up which will eventually form mountains along the two plates. Like a pile of sand was formed with the Indian and Eurasian Plate.

The response demonstrates an understanding that what would happen if the North American and Caribbean Plates collided is similar to what happened in the experiment and uses information learned in the experiment to make a logical inference about what would happen. The response acknowledges that stress between the Indian and Caribbean Plates could eventually cause mountains to form, similar to what happened in the experiment.

SCORE POINT 2

17

IF the North American Plate and Caribbean plate were to collide towards each other, there would be a huge build up of sand, just like there was in our model. Over millions of years the build up would only get bigger, and increase every year.

The response uses what was learned in the experiment to make a logical inference about what would happen if the North American and Caribbean Plates collided. The response explains that buildup of sand would occur over millions of years. However, the reference to a "huge buildup of sand" gives the impression that the student does not understand how sand formation leads to rock/mountain formation. The response is not clear enough to receive a score of 3.

NECAP 2008 RELEASED ITEMS
GRADE 8 SCIENCE

SCORE POINT 1

17

I predict that if the Caribbean and North American Plates were to collide they would form a mountain of some type.

The response receives credit for a minimal statement about mountain formation. The response does not tie the prediction to the experiment or demonstrate an understanding of the time scale involved in the formation of mountains.

SCORE POINT 0

17

I Predict that the Caribbean Plate is moving away from the North American Plate because the Panama canal keeps getting wider and wider.

The response does not demonstrate an ability to apply what was learned in the experiment to a similar scenario involving different plates. The Panama Canal is not evidence of plate divergence because it is man-made. The response is totally incorrect.