



**NEW ENGLAND  
COMMON ASSESSMENT PROGRAM**

**Released Items  
Support Materials  
2010**

**Grade 8  
Science**

**NECAP 2010 RELEASED ITEMS  
GRADE 8 SCIENCE**

**Grade 8 Science Released Item Information**

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

**Grade 8 Science Released Inquiry Task Information**

Item Number	Big Idea <sup>1</sup>	Inquiry Construct	Depth of Knowledge Code	Item Type <sup>2</sup>	Total Possible Points
1	INQ	5	2	SA	2
2	INQ	3	2	SA	2
3	INQ	12	3	CR	3
4	INQ	6	2	SA	2
5	INQ	12	3	CR	3
6	INQ	7	2	SA	2
7	INQ	11	2	SA	2
8	INQ	11	2	SA	2

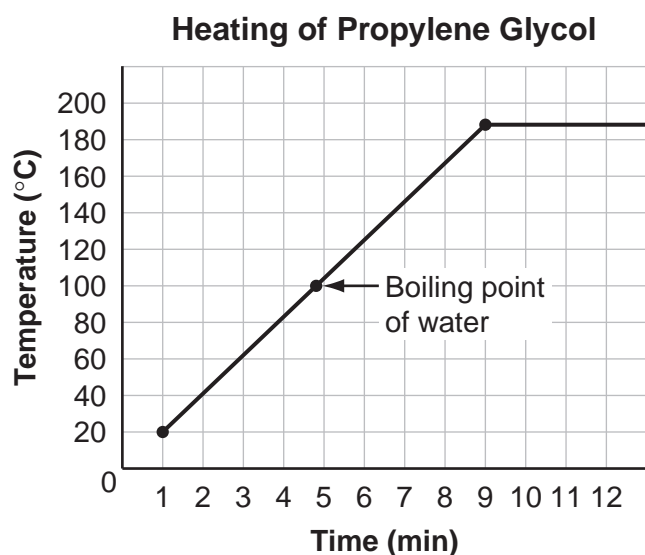
<sup>1</sup>Big Idea: NOS = Nature of Science, SAE = Systems and Energy, MAS = Models and Scale, POC = Patterns of Change, FAF = Form and Function, INQ = Scientific Inquiry

<sup>2</sup>Item Type: MC = Multiple Choice, CR = Constructed Response, SA = Short Answer

NECAP 2010 RELEASED ITEMS  
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**PS1 (5–8) POC-2** Students will, given data about characteristic properties of matter (e.g., melting and boiling points, density, solubility), identify, compare, or classify different substances.

- 1 A teacher heats 250 mL of propylene glycol in a beaker. The graph below shows the temperature data collected.



Which comparison can **best** be made based on this experiment?

- A. Propylene glycol has a lower boiling point than water.
- B. Propylene glycol has a lower melting point than water.
- C. Propylene glycol has a higher boiling point than water.
- D. Propylene glycol has a higher melting point than water.

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**PS1 (5–8) SAE-3** Students will collect data or use data provided to infer or predict that the total amount of mass in a closed system stays the same, regardless of how substances interact (conservation of matter).

2 The table below shows a chemical equation.

<b>Mass of Reactants</b>	<b>Mass of Products</b>
<b>Methane + Oxygen</b>	<b>Carbon Dioxide + Water</b>
50.0 g + 200.0 g	→ 137.5 g + ?

What is the mass of the water produced?

- A. 62.5 g
- B. 112.5 g
- C. 250.0 g
- D. 387.5 g

**NECAP 2010 RELEASED ITEMS  
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<b>PS2 (5–8) SAE-7</b>	Students will use data to draw conclusions about how heat can be transferred (convection, conduction, radiation).
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- 3 A student is using a metal wire to toast marshmallows in a campfire. Which statement **best** explains why the wire feels hot after several minutes?
- A. Heat is transferred from the fire through the wire by conduction.
  - B. Heat is transferred from the fire through the wire by radiation.
  - C. Hot air from the fire is circulated by conduction.
  - D. Hot air from the fire is circulated by radiation.

**NECAP 2010 RELEASED ITEMS  
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**ESS1 (5–8) POC-1** Students will use geological evidence provided to support the idea that the Earth's crust/lithosphere is composed of plates that move.

- 4 Over millions of years, coal formed from decayed plants that grew in hot, moist climates. Today, coal is found in northern regions such as Europe and North America.

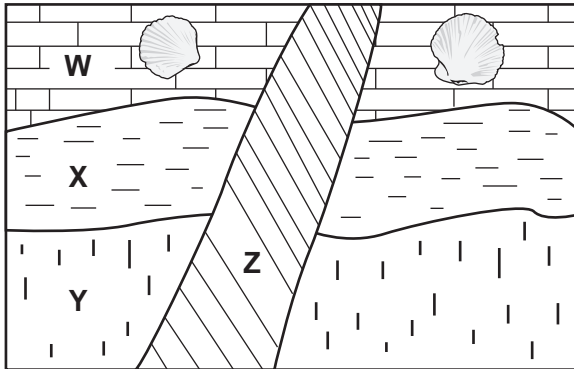
Why is coal now found where the climate is cool?

- A. Europe and North America were once located near the equator.
- B. The plants that form coal adapted to cool climates over time.
- C. Northern regions of Earth had a warm, desert climate many years ago.
- D. The plants that form coal grow during the summer months when the weather is warm.

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ESS1 (5–8) POC-3 Students will explain how Earth events (abruptly and over time) can bring about changes in Earth’s surface: landforms, ocean floor, rock features, or climate.

- 5 The diagram below shows a cross section of different rock layers.



Which conclusion correctly describes the **youngest** rock layer in the diagram?

- A. Layer W is the youngest because it is the top layer of sedimentary rock and the only layer that contains fossils.
- B. Layer X is the youngest because it is the middle layer of sedimentary rock.
- C. Layer Y is the youngest because it is the bottom layer of sedimentary rock.
- D. Layer Z is the youngest because it was once molten rock that moved through all three layers of sedimentary rock.

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**ESS2 (5–8) MAS-6** Students will compare and contrast planets based on data provided about size, composition, location, orbital movement, atmosphere, or surface features (includes moons).

*Please use the Solar System Data on the reference sheet to answer the question.*

- 6 The table below lists additional data about two planets.

**Additional Planetary Data**

<b>Planet</b>	<b>Average Temperature (°C)</b>	<b>Mass (10<sup>24</sup> kg)</b>	<b>Carbon Dioxide in Atmosphere (%)</b>
Mercury	167	0.3	3.5
Venus	457	4.9	96.5

Based on the information on the reference sheet and in the table, which data explains the difference between the average temperatures of Mercury and Venus?

- A. mass
- B. orbital period
- C. mean distance to the Sun
- D. composition of the atmosphere

**NECAP 2010 RELEASED ITEMS  
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**ESS1 (5–8) POC-1** Students will use geological evidence provided to support the idea that the Earth’s crust/lithosphere is composed of plates that move.

Use the Plate Movements diagram on the reference sheet to answer part (a).

7 The table below lists data scientists gathered from the continents of South America and Africa.

**Geologic Data from South America and Africa**

Data Sets	South America	Africa
<b>Ages of Rocks</b>	550–2000-million-year-old rocks along eastern coast	550–2000-million-year-old rocks along western coast
<b>Types of Animal Fossils</b>	<i>Mesosaurus</i> (reptile)	<i>Mesosaurus</i> (reptile)
<b>Types of Plant Fossils</b>	<i>Glossopteris</i> (fern)	<i>Glossopteris</i> (fern)
<b>Sedimentary Structures</b>	<ul style="list-style-type: none"> <li>• Ancient glacial deposits</li> <li>• Glacial scour marks trending from west to northwest</li> </ul>	<ul style="list-style-type: none"> <li>• Ancient glacial deposits</li> <li>• Glacial scour marks trending from west to northwest</li> </ul>

- a. Describe the role of the Mid-Atlantic Ridge in the separation of the continents of South America and Africa.
  
- b. Choose **two** sets of data from the table and explain how these data sets support the theory that South America and Africa were once joined together.

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**Scoring Guide**

<b>Score</b>	<b>Description</b>
<b>4</b>	The response demonstrates a thorough understanding of using geological evidence provided to support the idea that Earth's crust/lithosphere is composed of plates that move. The response identifies <b>two</b> sets of data from the table and explains in detail how these data sets support the theory that South America and Africa were once joined together. The response also describes the role of the Mid-Atlantic Ridge in the separation of the continents of South America and Africa.
<b>3</b>	The response demonstrates a general understanding of using geological evidence provided to support the idea that Earth's crust/lithosphere is composed of plates that move. The overall response is general.
<b>2</b>	The response demonstrates a limited understanding of using geological evidence provided to support the idea that Earth's crust/lithosphere is composed of plates that move. The overall response is limited.
<b>1</b>	The response demonstrates a minimal understanding of using geological evidence provided to support the idea that Earth's crust/lithosphere is composed of plates that move. The overall response is minimal.
<b>0</b>	The response is incorrect or irrelevant to the skill or concept being measured.
<b>Blank</b>	No response

**NECAP 2010 RELEASED ITEMS  
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**Training Notes:**

a. A thorough understanding can be exemplified by the following sample response:

The Mid-Atlantic Ridge is a boundary between the South American Plate and the African Plate. These plates moved away from the mid-ocean ridge, in opposite directions.

b. A thorough understanding can be exemplified by **two** of the following sample responses:

Rocks of similar ages along opposite coasts = supports the idea that the continents were once joined because the rocks would have formed at the same time from the same processes.

The same type of reptile fossil (*Mesosaurus*) found on both continents = the reptile would not have spontaneously formed in two separate places but would have evolved to live in the region that was joined. Therefore, when the continents separated, the reptiles would have died and been preserved in those two places.

The same type of fern fossil (*Glossopteris*) found on both continents = the plant would not have spontaneously formed in two separate places but would have evolved to live in the region that was joined. Therefore, when the continents separated, the plants would have died and been preserved in those two places.

Glacial deposits = the glaciers would have scraped along the joined area toward the west or northwest, leaving deposits. They would not have spanned the ocean. When the continents separated, the marks were preserved on both continents.

Glacial scour marks = the glaciers would have scraped along the joined area toward the west or northwest, creating the scour marks. They would not have spanned the ocean. When the continents separated, the marks were preserved on both continents.

Note: The response does not need to specify the scientific names (*italics*) of the reptile or fern fossils. However, the response should refer to the reptile or fern being the same in order for the fossils to be used as evidence.

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SCORE POINT 4

7

A.

The Mid-Atlantic Ridge was a major role in breaking up Africa and South America. The Ridge caused a division between the South American Plate and African plate which split the previous continent in half. Then the new plates pushed apart from each other millions of years to the current time. This Mid-Atlantic Ridge is now the line of symmetry between the plates.

B.

Both the fossils and geology of Africa and South America support the theory that these two areas were once connected. The fossils show that both Glossopteris and Mesosaurus lived in both of these areas. If these two areas had not been connected, how would these two fossils have been evolved into the same time? They would have to swim across an ocean and that is not plausible. Also the geology of these areas are incredibly similar. Both areas of land have glacial deposits and scour marks moving from west to northwest. This is proof that the areas were once attached and glaciers were moving across both pieces of land at the same time.

The response demonstrates a thorough understanding of using the geological evidence provided to support the idea that the Earth's crust is composed of plates that move. The response identifies two sets of data (fossils and geology) to explain how these data sets support the theory that South America and Africa were once joined together.

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SCORE POINT 3

7 A: The mid-Atlantic Ridge slowly pushed the continents apart.

B: There were fossils found on the west coast of Africa and the same fossils found on the East coast of South America the two are thousands of miles apart and the fern couldn't move so the continents had to.

There were reptile fossils found on the Eastern coast of South America and on the Western coast of Africa the reptile couldn't have swam from one to the other so the continents must have been together then split.

The response demonstrates a general understanding of using geological evidence to support the idea that the Earth's crust is composed of plates that move. Response identifies two sets of data (reptile and fern fossils) and explains how these data sets support the idea that South America and Africa were once joined together.

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SCORE POINT 2

7 Millions of years ago the South American Plate and the African Plate were conjoined. But they broke apart. The mid-Atlantic Ridge is where they broke off.

Both South America and Africa have the same type of animal fossils, Mesosaurus, and plant fossils, Glossopteris. This shows that millions of years ago they had the same animals and plants and were probably conjoined.

The response demonstrates a limited understanding of using geological evidence to support the idea that Earth's crust is composed of plates that move.

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SCORE POINT 1

- 7 a. The mid-Atlantic ridge pushed South America and Africa apart.
- 
- B) This data is all alike.

The response demonstrates a minimal understanding in part (a), and receives no credit for part (b).

SCORE POINT 0

- 7 A.) its too far.
- B.) Mesosaurus (reptile) and Glossopteris (fan)

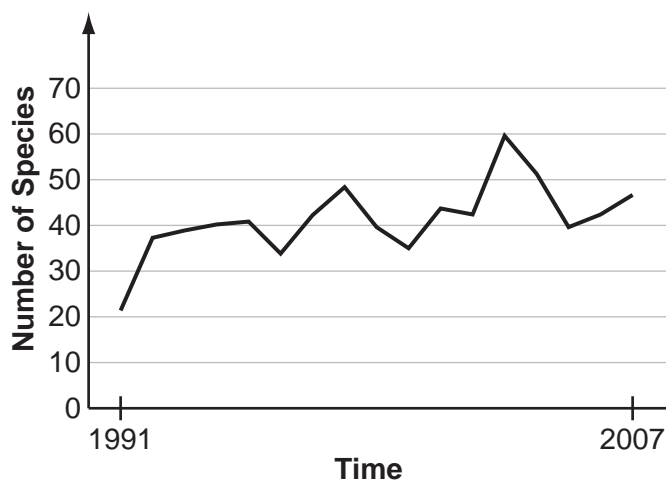
The response does not give any support or explanation. Simply choosing two pieces of evidence from the chart does not demonstrate any understanding.

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**LS1 (5–8) SAE-1** Students will, 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.

- 8 Sewage sludge was repeatedly dumped into Boston Harbor until 1991, which polluted the harbor. Scientists recorded the number of species in Boston Harbor from 1991 until 2007. The graph below shows the results.

**Biodiversity in Boston Harbor**



Which prediction do the data in the graph **most** support?

- A. The ecosystem will have fewer habitats because the number of species is increasing.
- B. The ecosystem will become more stable because the number of species is increasing.
- C. The ecosystem will become unstable because the number of species is decreasing.
- D. The ecosystem will have fewer types of species because the number of species is decreasing.

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LS2 (5–8) SAE-5 Students will, using data and observations, predict outcomes when abiotic/biotic factors are charged in an ecosystem.

- 9 The picture below shows an aquatic plant called a water hyacinth.



Water hyacinth plants are classified as an invasive species in most states. The plants grow on top of water and form thick mats, quickly covering the surface of ponds or rivers.

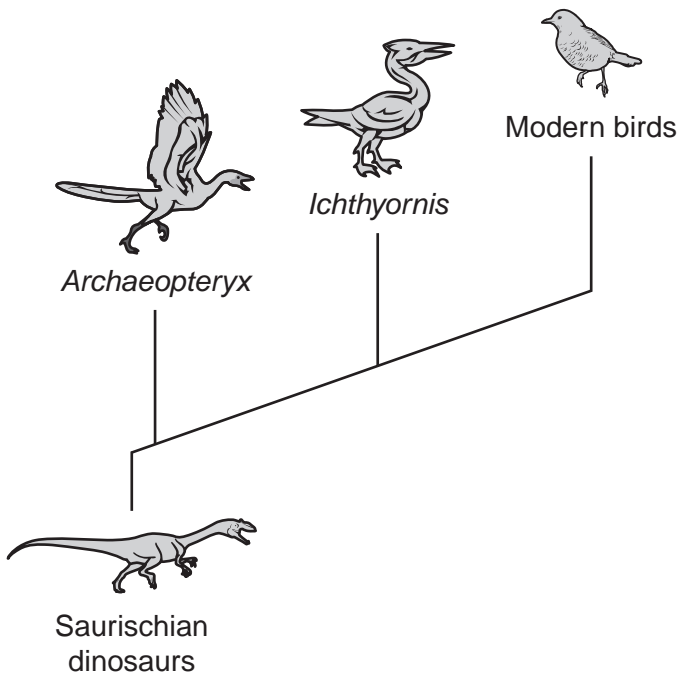
Which statement **best** predicts what will happen when water hyacinth plants enter an ecosystem?

- A. Other aquatic plant species will have less available sunlight.
- B. All herbivores in the ecosystem will start to eat water hyacinth plants.
- C. Other aquatic plant species will have more available sunlight.
- D. The water hyacinth plants will have no effect on the ecosystem.

NECAP 2010 RELEASED ITEMS  
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**LS3 (5–8) MAS-8** Students will use a model, classification system, or dichotomous key to illustrate, compare, or interpret possible relationships among groups of organisms (e.g., internal and external structures, anatomical features).

- 10 The diagram below shows one example of an evolutionary line for birds.



Which conclusion does the information in the diagram **best** support?

- A. *Ichthyornis* is still living today.
- B. All of these organisms evolved at the same time.
- C. Most bird fossils found today are Saurischian dinosaurs.
- D. *Archaeopteryx* and modern birds have a common ancestor.

**NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE**

<b>Broad Area of Inquiry:</b> <b>Planning and Critiquing of Investigations</b> <b>Inquiry Construct 5:</b> Develop an organized and logical approach to investigating the question, including controlling variables.
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- 1 Explain why it was important in this investigation to measure the mass of the substances and bags before **and** after you mixed the substances. Use specific evidence to support your answer.

**Scoring Guide**

<b>Score</b>	<b>Description</b>
<b>2</b>	The response demonstrates a general understanding of why it is important in this investigation to measure the mass of the substances before and after the substances are mixed together. The response uses specific evidence to support answer.
<b>1</b>	The response demonstrates a limited understanding of why it is important in this investigation to measure the mass of the substances before and after the substances are mixed together. The response may or may not provide specific evidence to support answer.
<b>0</b>	The response is incorrect or irrelevant to the skill or concept being measured.
<b>Blank</b>	No response

**Training Notes:**

The purpose of the experiment is to determine if the mass of substances changes when mixed together, so it's important to measure the mass before and after mixing for comparison.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 2

- 1 Explain why it was important in this investigation to measure the mass of the substances and bags before **and** after you mixed the substances. Use specific evidence to support your answer.

It was important in this investigation to measure the mass of the substances and bags before and after we mixed the substances because we needed something to compare to. by doing that, we found out that the end result had less mass than when it started. this is something that we could have missed if we did not measure the two different masses.

The response demonstrates a general understanding of why it is important to measure the mass of the substances before and after the substances are mixed together. Response includes evidence ("we found out that the end result had less mass than when it started") for support.

NECAP 2010 RELEASED INQUIRY TASK  
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SCORE POINT 2 (CONTINUED)

Data Table 1: Mass Differences and Observations

Investigation	Average Difference in Mass (Number of Washers)
Powder X and water	

In the box below, copy your observations from “After Mixing with Water” from page 9 in your Inquiry Booklet.

**After Mixing with Water**

Trial 1	The bag filled with air. the powder dissolved and the water became clear again. when the powder was dissolving, there were many bubbles in the water/powder mixture. at the end, all of the water was left, but no trace of powder
Trial 2	the bag filled up with air more than the other. the powder dissolved in the water, after, the water became clear again. when the powder was dissolving there were many bubbles in the water/powder mixture. at the end, only the water was left.
Trial 3	the bag filled with air like trials 1 and 2. the powder dissolved quicker than the others. after it dissolved, the water became clear again. when the powder dissolved, there were many bubbles in the water. in the end, only water remained.

NECAP 2010 RELEASED INQUIRY TASK  
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SCORE POINT 1

- 1 Explain why it was important in this investigation to measure the mass of the substances and bags before **and** after you mixed the substances. Use specific evidence to support your answer.

It was important to measure the mass before and after to see if the mass changed at all.

The response demonstrates a limited understanding of why it is important to measure the mass before and after the substances are mixed together. The response does not provide evidence for support.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 1 (CONTINUED)

Data Table 1: Mass Differences and Observations

Investigation	Average Difference in Mass (Number of Washers)
Powder X and water	0 washers

In the box below, copy your observations from "After Mixing with Water" from page 9 in your Inquiry Booklet.

After Mixing with Water

Trial 1	Once we poured the water in it started to bubble.
Trial 2	We saw it bubble again.
Trial 3	We saw it bubble again.

NECAP 2010 RELEASED INQUIRY TASK  
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SCORE POINT 0

- 1 Explain why it was important in this investigation to measure the mass of the substances and bags before **and** after you mixed the substances. Use specific evidence to support your answer.

It was important to measure the mass of the substance in this investigation because those are the steps you have to go by in order to get the right results.

The response does not contain any correct elements of why it is important to measure the mass of the substances before and after the substances are mixed together. Although following directions is a good idea, the response does not demonstrate an understanding of the task.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 0 (CONTINUED)

Data Table 1: Mass Differences and Observations

Investigation	Average Difference in Mass (Number of Washers)
Powder X and water	0

In the box below, copy your observations from "After Mixing with Water" from page 9 in your Inquiry Booklet.

After Mixing with Water

Trial 1	It was bubbling up
Trial 2	It was bubbling up like Sprite
Trial 3	It still was still bubbling

**NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE**

**Broad Area of Inquiry:** **Formulating Questions & Hypothesizing**  
**Inquiry Construct 3:** Make and describe observations in order to ask questions, hypothesize, make predictions related to topic.

- 2 Look at your prediction on page 4 of your Inquiry Booklet. Do the results of your investigation support your prediction? Use specific information from the investigation to explain your answer.

**Scoring Guide**

Score	Description
2	The response indicates whether the data supports the prediction and uses specific information from the investigation to support the answer.
1	The response indicates whether the data supports the prediction and provides a limited explanation to support the answer.
0	The response is incorrect or irrelevant to the skill or concept being measured.
<b>Blank</b>	No response

**Training Notes:**

The response will indicate that the results of the investigation do or do not support the prediction. The response will also provide specific information from the investigation to explain why.

The data should support the prediction (no change in mass), but it is possible that a measuring error would give data that would refute it. This possibility is acceptable as long as the argument and data are used appropriately.

A “yes” or “no” is not considered enough for a limited explanation.

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SCORE POINT 2

- 2 Look at your prediction on page 4 of your Inquiry Booklet. Do the results of your investigation support your prediction? Use specific information from the investigation to explain your answer.

The results of my investigation did in fact support my prediction. In all three trials the mass was 3 washers before, and three washers after, giving it the same mass throughout the investigation.

The response contains specific information from the investigation ("3 washers before...and after") to support the prediction.

NECAP 2010 RELEASED INQUIRY TASK  
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SCORE POINT 2 (CONTINUED)

Data Table 1: Mass Differences and Observations

Investigation	Average Difference in Mass (Number of Washers)
Powder X and water	0 washers

In the box below, copy your observations from "After Mixing with Water" from page 9 in your Inquiry Booklet.

After Mixing with Water

Trial 1	Turned clear, bubbled, looks like soda.
Trial 2	Bubbles rise from the bottom of the bag up, turned transparent.
Trial 3	Bag filled with air after the water was added, bubbled, turned clear, felt colder after the bubbles calmed down.

NECAP 2010 RELEASED INQUIRY TASK  
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SCORE POINT 1

- 2 Look at your prediction on page 4 of your Inquiry Booklet. Do the results of your investigation support your prediction? Use specific information from the investigation to explain your answer.

Yes they matched up.  
The masses stayed  
the same.

The response indicates that the results of the investigation do support the prediction with a limited explanation. No specific information is included.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 1 (CONTINUED)

Data Table 1: Mass Differences and Observations

Investigation	Average Difference in Mass (Number of Washers)
Powder X and water	0

In the box below, copy your observations from "After Mixing with Water" from page 9 in your Inquiry Booklet.

After Mixing with Water

Trial 1	It was 3 washers still, It bubbled a lot.
Trial 2	3 washers. The bag puffed up.
Trial 3	bag puffs up. still three washers

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 0

- 2 Look at your prediction on page 4 of your Inquiry Booklet. Do the results of your investigation support your prediction? Use specific information from the investigation to explain your answer.

In the 1<sup>st</sup> and 2<sup>nd</sup> trial they were similar with 4 and 4. But when we did the 3<sup>rd</sup> trial we had 3.

The response does not indicate whether or not the prediction was supported.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 0 (CONTINUED)

Data Table 1: Mass Differences and Observations

Investigation	Average Difference in Mass (Number of Washers)
Powder X and water	

In the box below, copy your observations from "After Mixing with Water" from page 9 in your Inquiry Booklet.

After Mixing with Water

Trial 1	It started seizing
Trial 2	It started seizing
Trial 3	It started seizing

**NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE**

<b>Broad Area of Inquiry:</b> <b>Developing and Evaluating Explanations</b> <b>Inquiry Construct 12:</b> Use evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis.
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- 3 Do you think the investigation was a controlled investigation? Use specific data and examples to support your answer.

**Scoring Guide**

<b>Score</b>	<b>Description</b>
<b>3</b>	The response identifies the investigation as a controlled investigation or not. The response uses specific data and examples to generally support the answer.
<b>2</b>	The response identifies the investigation as a controlled investigation or not. The response uses specific data and examples to partially support the answer.
<b>1</b>	The response identifies the investigation as a controlled investigation or not. The response uses specific data and examples to minimally support the answer.
<b>0</b>	The response does not contain any correct elements or is irrelevant.
<b>Blank</b>	No response

**Training Notes:**

The investigation is a controlled investigation.

Specific data and examples that indicate the investigation is a controlled investigation include:

The investigation is performed in a laboratory in which all the variables were the same for each trial: the same materials and the same procedure.

A “yes” or “no” is not considered enough for a minimal explanation.

Note: If the response argues that it is not a controlled experiment and gives a convincing argument (for example, the weighing technique was not accurate enough), credit should be given.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 3

- 3 Do you think the investigation was a controlled investigation? Use specific data and examples to support your answer.

Yes I think this was a controlled investigation because there was nothing on the outside that could affect this. For example measuring the water and powder x you had to be exact and the containers had ~~an~~ exact measurements on them. Like when you measured water it had to be 15 ml of water and the cup had an exact measurement of 15 ml. Also when you mixed them together you mixed them in a plastic bag that zipped up tightly so no air could get in.

The response identifies the investigation as a controlled investigation. Exact measurements and the use of bags that “zipped up tightly” are examples of variables that are the same for each trial in a controlled investigation.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 3 (CONTINUED)

Data Table 1: Mass Differences and Observations

Investigation	Average Difference in Mass (Number of Washers)
Powder X and water	0

In the box below, copy your observations from "After Mixing with Water" from page 9 in your Inquiry Booklet.

After Mixing with Water

Trial 1	After mixing with water and X powder together it starts fizzing with white bubbles then after a few seconds it dies down the fizzing and is clear. It also is very cold. At the end of the fizzing there are still bubbles, but they are really tiny bubbles.
Trial 2	After mixing the two substances it started fizzing with big white bubbles. After a few seconds it dies down but still has tiny bubbles and the substance created is a clear liquid.
Trial 3	After mixing the water and powder X they start to fizzle. After a few seconds it stops fizzling and it is cold. It also blows up the bag so that the bag is not flat anymore.

NECAP 2010 RELEASED INQUIRY TASK  
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SCORE POINT 2

- 3 Do you think the investigation was a controlled investigation? Use specific data and examples to support your answer.

Yes. The experiment was controlled. We used the same ingredients every time, same amount, <sup>and</sup> same order.

The response identifies the investigation as a controlled investigation. The response provides partial support with "same amount" and "same order."

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 2 (CONTINUED)

Data Table 1: Mass Differences and Observations

Investigation	Average Difference in Mass (Number of Washers)
Powder X and water	0

In the box below, copy your observations from "After Mixing with Water" from page 9 in your Inquiry Booklet.

After Mixing with Water

Trial 1	powder x fizzed in order to mix with water. Mixture is bubbly and opaque but becomes clear.
Trial 2	Cold when fizzing. opaque. Mixture is bubbly opaque but becomes clear
Trial 3	Cold, bubbly fizzing, opaque but becomes clear.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 1

- 3 Do you think the investigation was a controlled investigation? Use specific data and examples to support your answer.

The investigation was a controlled investigation because we had a certain process and steps we had to follow and we did

The response identifies the investigation as a controlled investigation with minimal support (“follow a certain process and steps”).

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 1 (CONTINUED)

Data Table 1: Mass Differences and Observations

Investigation	Average Difference in Mass (Number of Washers)
Powder X and water	

In the box below, copy your observations from "After Mixing with Water" from page 9 in your Inquiry Booklet.

After Mixing with Water

Trial 1	<ul style="list-style-type: none"><li>• cloudy water</li><li>• fizzy</li><li>• dissolved</li><li>• foggy</li><li>• small chunks</li></ul>
Trial 2	<ul style="list-style-type: none"><li>• more bubbly</li><li>• Not as cloudy</li><li>• dissolved</li><li>• NO chunks</li></ul>
Trial 3	<ul style="list-style-type: none"><li>• fizzy</li><li>• slightly chunky</li><li>• More clear</li></ul>

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 0

- 3 Do you think the investigation was a controlled investigation? Use specific data and examples to support your answer.

yes it was it came out to be the same every time.

The response discusses the "same" **results** but does not address the investigation as a controlled investigation or not.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 0 (CONTINUED)

Data Table 1: Mass Differences and Observations

Investigation	Average Difference in Mass (Number of Washers)
Powder X and water	

In the box below, copy your observations from "After Mixing with Water" from page 9 in your Inquiry Booklet.

After Mixing with Water

Trial 1	It looks like baked soda
Trial 2	It bubbled and fizzed
Trial 3	It fizzed a lot

**NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE**

**Broad Area of Inquiry:** Planning and Critiquing of Investigations  
**Inquiry Construct 6:** Provide reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation.

- 4 Compare your results with those of the students who left their bags open. Explain why your results are the same or different. Use evidence to support your answer.

**Scoring Guide**

<b>Score</b>	<b>Description</b>
<b>2</b>	The response provides a general comparison of results and uses evidence to support explanation.
<b>1</b>	The response provides a limited comparison of results and may or may not use evidence to support explanation.
<b>0</b>	The response does not contain any correct elements or is irrelevant.
<b>Blank</b>	No response

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 2

- 4 Compare your results with those of the students who left their bags open. Explain why your results are the same or different. Use evidence to support your answer.

After comparing my results with the students who left their bags open, it shows that our results are different. The average difference that we found was 0 washers. One of the observations that we made was that the ingredients mixed together created a gas inside the bag. If you left the bag open, the gas that was created would escape. This would affect your mass when you measured it after the substances were mixed together because some of the gas would be gone. That is why their mass is a little bit different.

The response includes a general comparison of the results with specific evidence from the investigation for support.

**NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE**

**SCORE POINT 2 (CONTINUED)**

**Data Table 1: Mass Differences and Observations**

Investigation	Average Difference in Mass (Number of Washers)
Powder X and water	0 washers/units

In the box below, copy your observations from "After Mixing with Water" from page 9 in your Inquiry Booklet.

**After Mixing with Water**

Trial 1	<ul style="list-style-type: none"> <li>- Fizzed - bubbling - created air in the bag</li> <li>- most of the powder dissolved - looks like sprite</li> <li>- A few clumps on the bottom</li> <li>- Got colder</li> </ul>
Trial 2	<ul style="list-style-type: none"> <li>- Fizzed - bubbling - most of the powder dissolved</li> <li>- A few clumps on bottom</li> <li>- created air in the bag</li> <li>- Got colder - looks like sprite</li> </ul>
Trial 3	<ul style="list-style-type: none"> <li>- Bubbling - Fizzed - Got colder</li> <li>- most of the powder dissolved - A few clumps on the bottom</li> <li>- created air in the bag</li> <li>- Got colder - looks like sprite</li> </ul>

NECAP 2010 RELEASED INQUIRY TASK  
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SCORE POINT 1

- 4 Compare your results with those of the students who left their bags open. Explain why your results are the same or different. Use evidence to support your answer.

Our results are different because their "Average difference in mass (number of washers)" was 0.5 while ours was 0. They must of did something wrong while in the process, or us.

The response provides a limited comparison of results, but does not include an explanation of the difference.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 1 (CONTINUED)

**Data Table 1: Mass Differences and Observations**

Investigation	Average Difference in Mass (Number of Washers)
Powder X and water	0

In the box below, copy your observations from “After Mixing with Water” from page 9 in your Inquiry Booklet.

**After Mixing with Water**

Trial 1	<ul style="list-style-type: none"> <li>• fizzed</li> <li>• bubbly sounds</li> <li>• no more powder</li> <li>• powder dissolved</li> <li>• not clear</li> </ul> <p style="text-align: right;">• 3 washers</p>
Trial 2	<ul style="list-style-type: none"> <li>• fizzy</li> <li>• bubbly sound</li> <li>• not clear</li> <li>• bubbling in the water</li> <li>• 3 washers</li> </ul>
Trial 3	<ul style="list-style-type: none"> <li>• bubbly</li> <li>• fizzy</li> <li>• bubbly sound</li> <li>• not clear</li> </ul> <p style="text-align: right;">• 3 washers</p>

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 0

- 4 Compare your results with those of the students who left their bags open. Explain why your results are the same or different. Use evidence to support your answer.

First we put the power in the COP added  
water and is gone to happen

The response does not address the item.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 0 (CONTINUED)

Data Table 1: Mass Differences and Observations

Investigation	Average Difference in Mass (Number of Washers)
Powder X and water	

In the box below, copy your observations from "After Mixing with Water" from page 9 in your Inquiry Booklet.

After Mixing with Water

Trial 1	It dos entha ppenothing
Trial 2	it dos entha ppenothing
Trial 3	it do entha ppenothing

**NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE**

<b>Broad Area of Inquiry:</b> <b>Developing and Evaluating Explanations</b> <b>Inquiry Construct 12:</b> Use evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis.
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- 5 Use the information in Data Table 3 to graph the relationship between the candle's mass and time. Clearly label each axis and include a title.

**Scoring Guide**

<b>Score</b>	<b>Description</b>
<b>3</b>	The response includes a correct graph of the relationship between the candle's mass and time. The graph includes an appropriate title, data matches data in table, correct scale, and labeled axes with units. Any errors or omissions do not detract from the information conveyed by the graph.
<b>2</b>	The response includes a graph of the relationship between the candle's mass and time. Any errors or omissions distract from the information conveyed by the graph.
<b>1</b>	The response includes a graph of the relationship between the candle's mass and time. Any errors or omissions interfere with the information conveyed by the graph.
<b>0</b>	The response is incorrect or irrelevant to the skill or concept being measured.
<b>Blank</b>	No response

**Training Notes:**

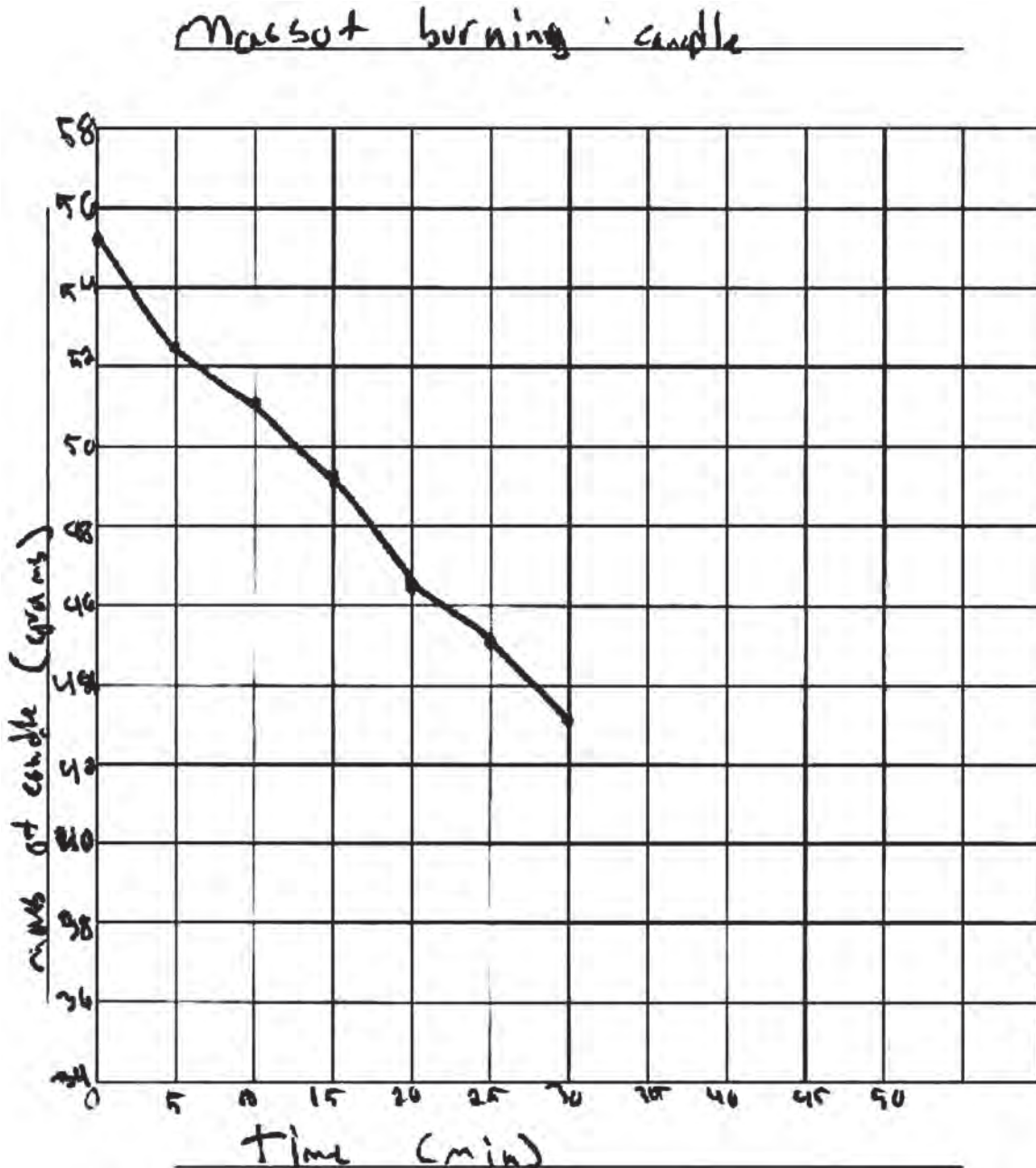
A bar graph, line graph, or scatter plot is the expected presentation including the following:

- Time (min) should be plotted on the x-axis and Mass (g) on the y-axis.
- Labeled axes including units
- Title: Mass Versus Time
- Correct scale

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 3

- 5 Use the information in Data Table 3 to graph the relationship between the candle's mass and time. Clearly label each axis and include a title.

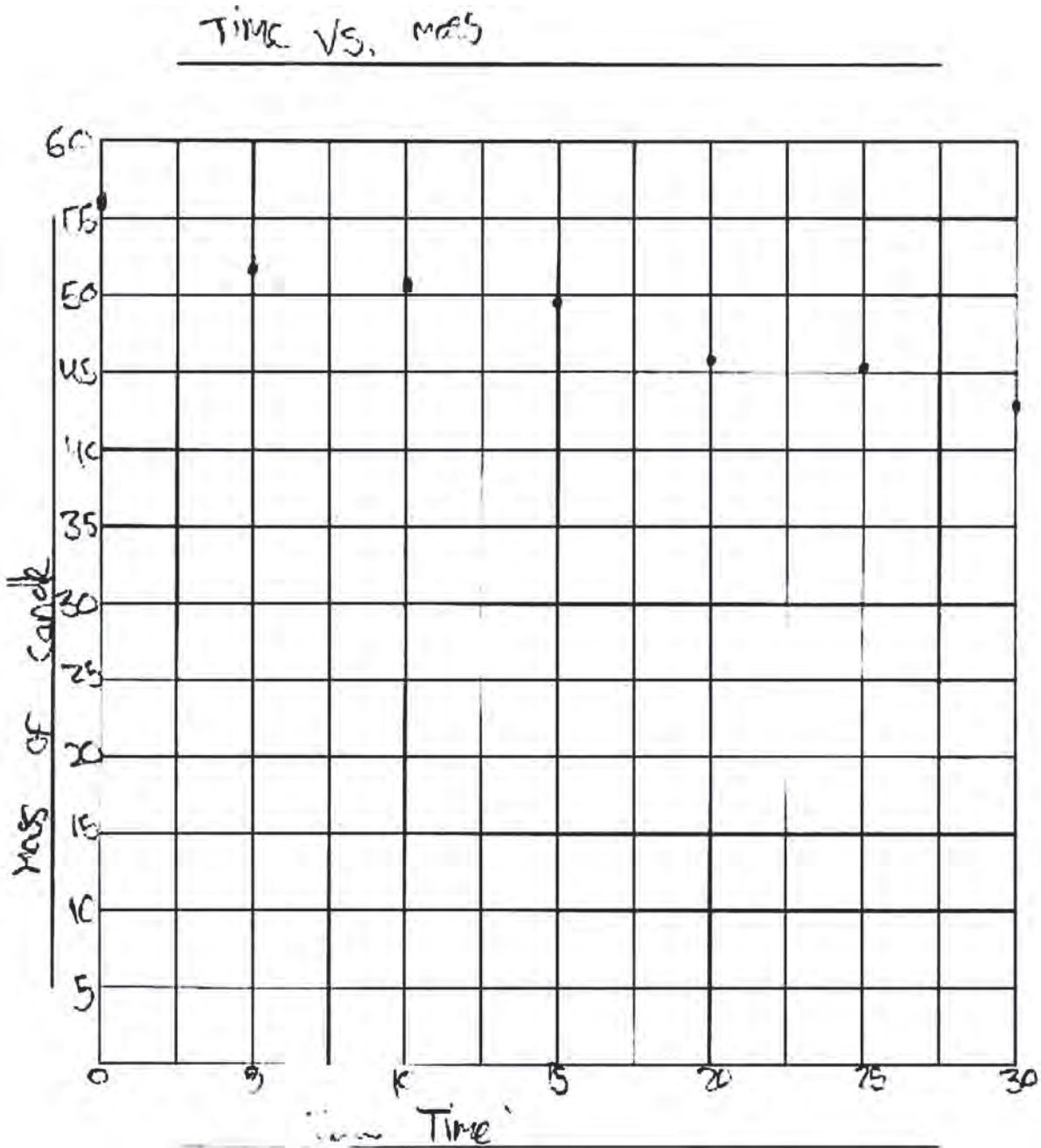


The response includes a correct graph of the relationship between the mass of the candle and time. The graph includes an appropriate title, data points that match data in the table, correct scale (starting the y-axis at 34 does not distract from the information conveyed by the graph), and correctly labeled axes with units.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 2

- 5 Use the information in Data Table 3 to graph the relationship between the candle's mass and time. Clearly label each axis and include a title.

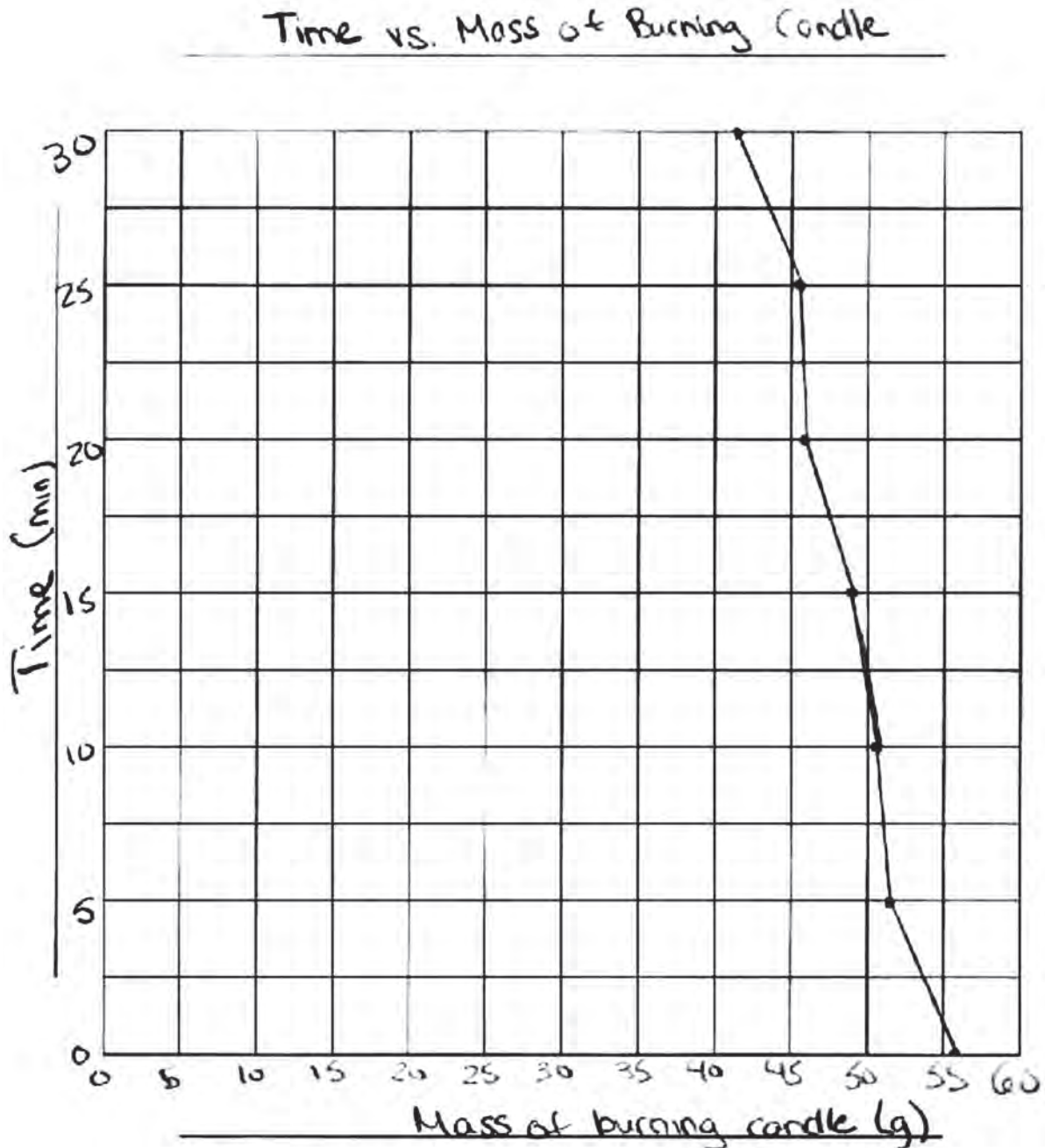


The response includes a graph of the relationship between the mass of the candle and time. Errors distract from the information conveyed by the graph (x- and y-axis labels are missing units.) Scale is correct, title is correct, and most points are reasonably plotted.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 1

- 5 Use the information in Data Table 3 to graph the relationship between the candle's mass and time. Clearly label each axis and include a title.

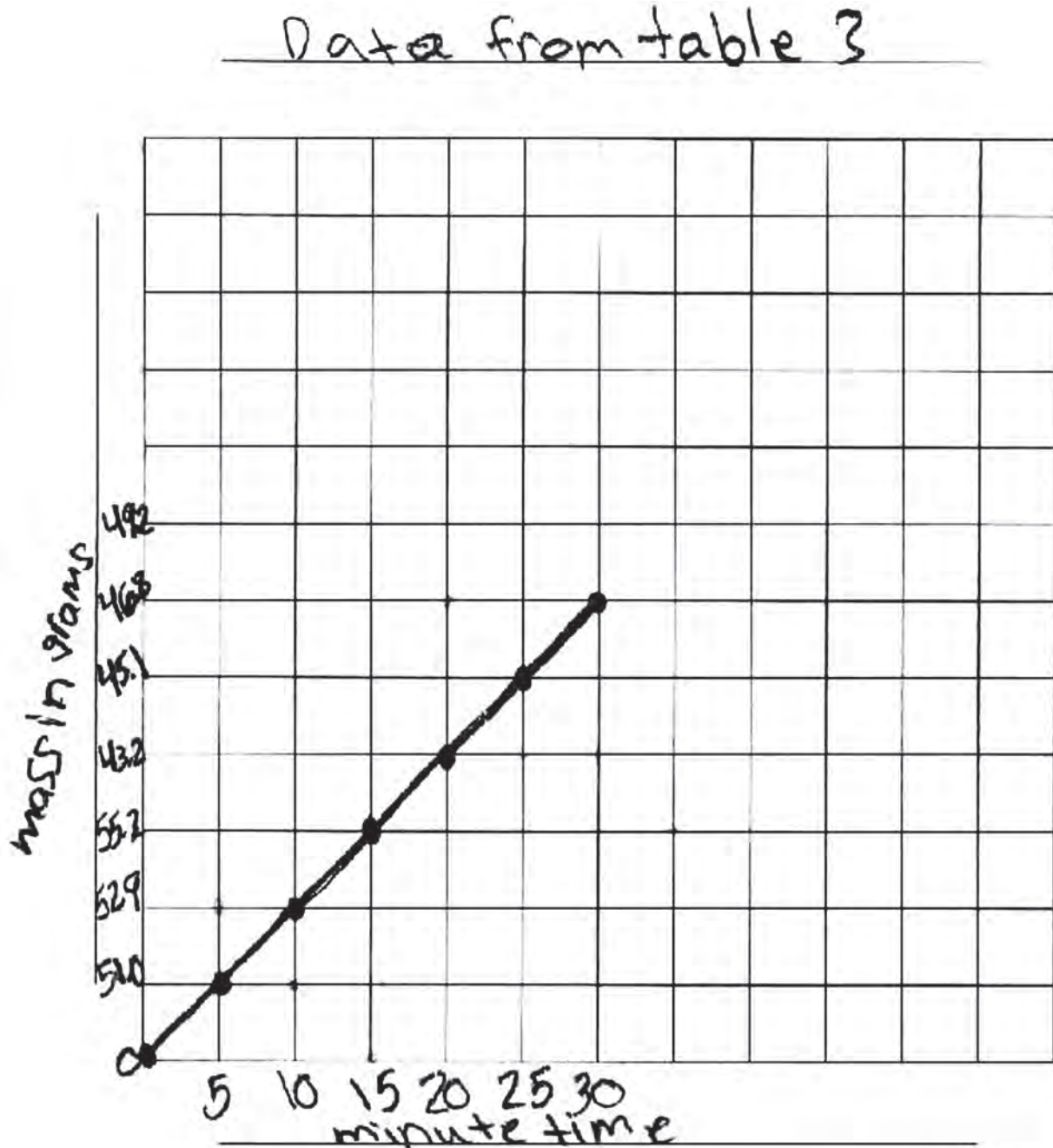


The response includes a graph of the relationship between the mass of the candle and time. However, plotting the dependent variable on the x-axis is a significant error that interferes with the conveying of information.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 0

- 5 Use the information in Data Table 3 to graph the relationship between the candle's mass and time. Clearly label each axis and include a title.



The response contains significant errors in graph construction. The y-axis is scaled to the data points, and is in descending order. Both are significant errors which do not convey correct information about the relationship between the mass of the candle and time.

**NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE**

**Broad Area of Inquiry:** Conducting Investigations

**Inquiry Construct 7:** Follow procedures for collecting and recording qualitative or quantitative data, using equipment or measurement devices accurately.

- 6 Describe the pattern (trend) in the mass of the candle over time shown in your graph. Compare your graph to Graph 1. Use specific data in your comparison.

**Scoring Guide**

<b>Score</b>	<b>Description</b>
<b>2</b>	The response demonstrates a general understanding of the trends in the graphs and how to compare the data. The response describes the pattern (trend) in the data, compares the graph to Graph 1, and uses specific data in the comparison.
<b>1</b>	The response demonstrates a limited understanding of the trends in the graphs and how to compare the data.
<b>0</b>	The response does not contain any correct elements or is irrelevant.
<b>Blank</b>	No response

**Training Notes:**

The mass of the candle decreases over time in my graph. Graph 1 shows that the difference in mass increases over time. Both graphs show that the candle mass decreased by 12 g over the length of the experiment.

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GRADE 8 SCIENCE

SCORE POINT 2

- 6 Describe the pattern (trend) in the mass of the candle over time shown in your graph. Compare your graph to Graph 1. Use specific data in your comparison.

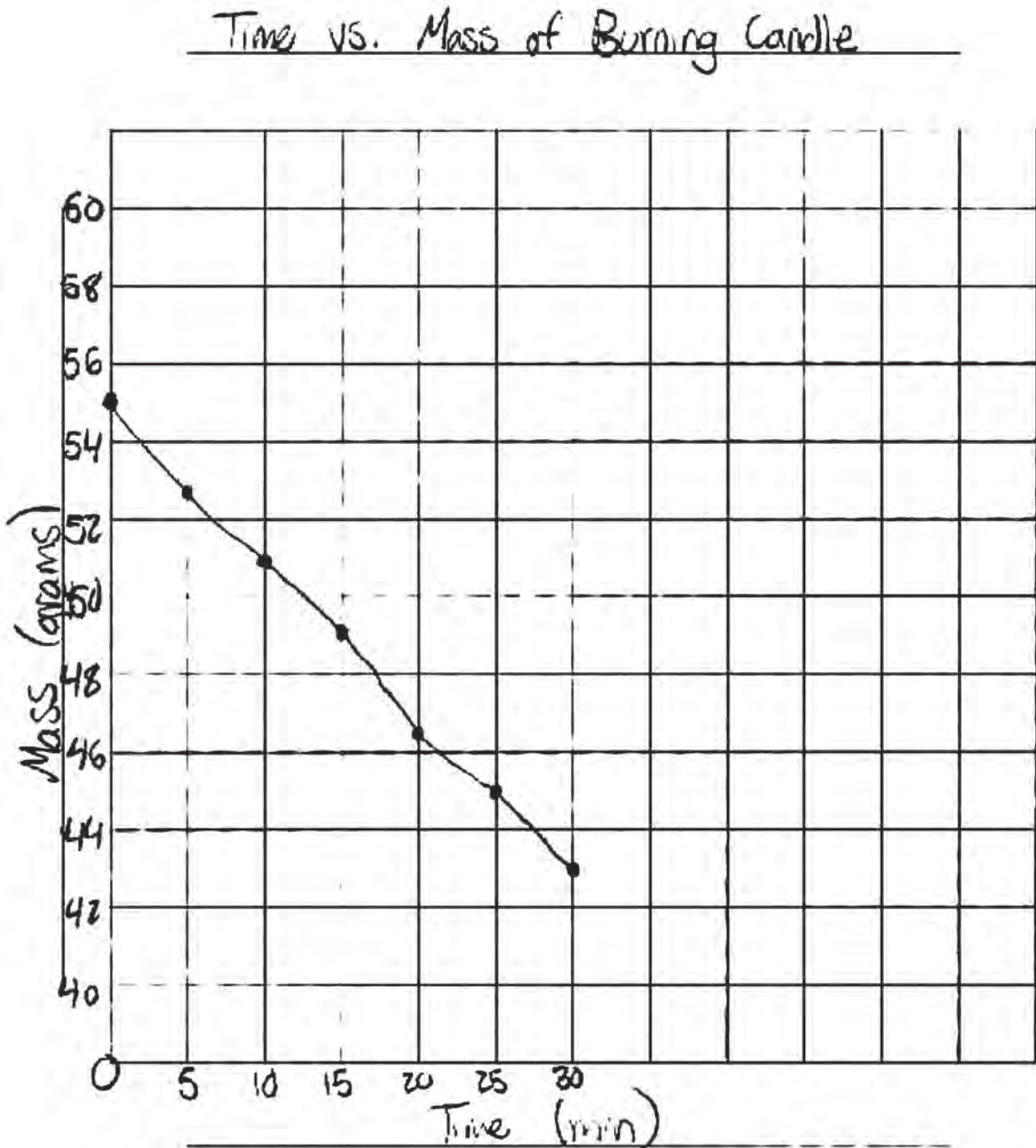
In my graph it shows how the mass goes down over time. Hers shows the difference in mass over time that's why it is going up. So while mine is going down and hers is going up. They are both right just hers is showing a different comparison.

The response demonstrates a general understanding of the mass of the candle decreasing over time. The description of the trend of the graph describing the mass ("going down") and the description of the trend of the "difference in mass" of Graph 1 ("going up") is accurate.

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GRADE 8 SCIENCE

SCORE POINT 2 (CONTINUED)

- 5 Use the information in Data Table 3 to graph the relationship between the candle's mass and time. Clearly label each axis and include a title.



NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 1

- 6 Describe the pattern (trend) in the mass of the candle over time shown in your graph. Compare your graph to Graph 1. Use specific data in your comparison.

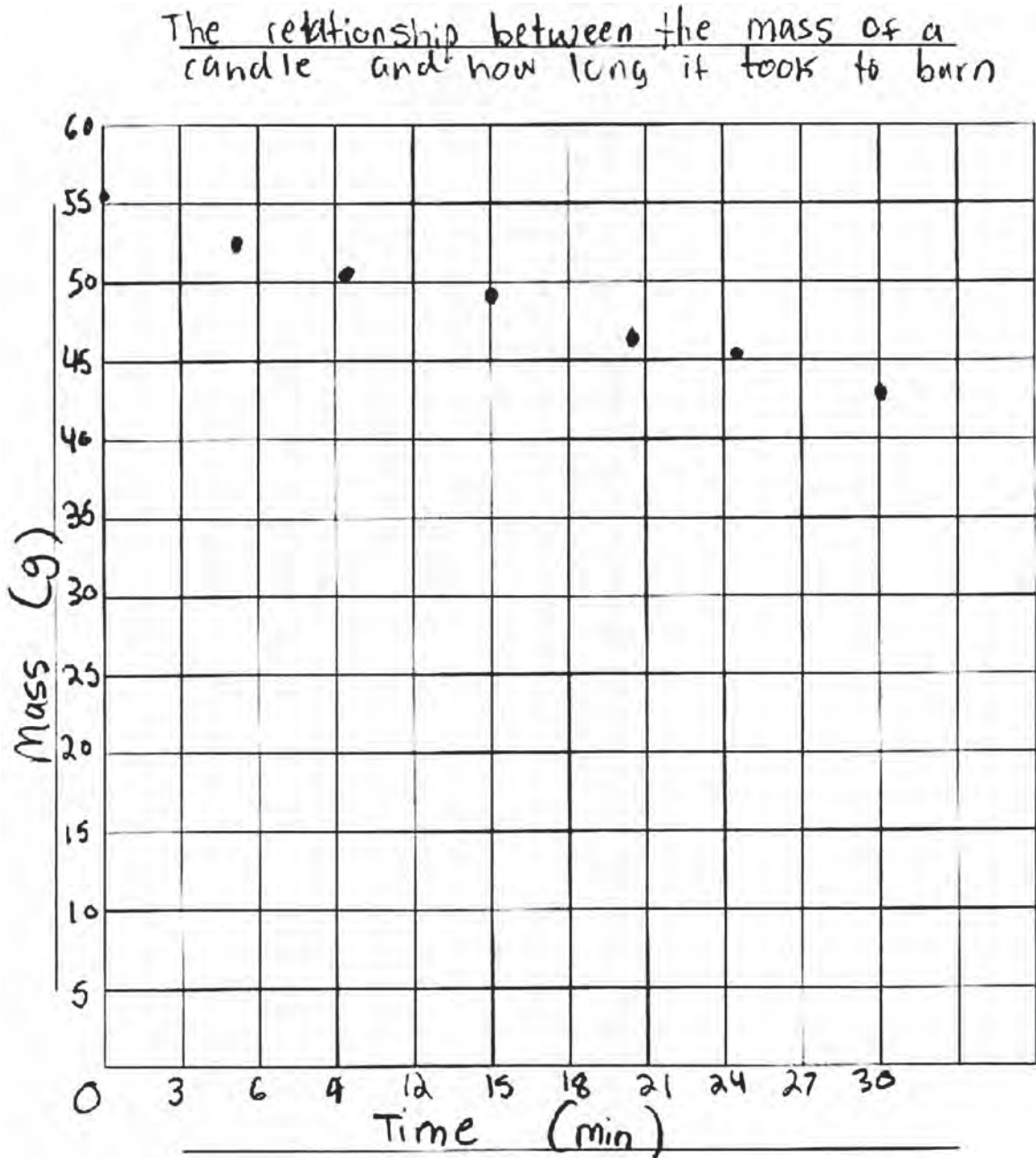
The pattern that goes on in my graph is that as more time the candle burns, the less mass it has. When the candle first started cut, the mass was 55.1 and then when it was burning for 30 minutes the candle had a mass of 43.2

The response demonstrates a limited understanding of the trend of the graph with an explanation of the pattern in the mass of the candle over time, but does not include a comparison to Graph 1.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 1 (CONTINUED)

- 5 Use the information in Data Table 3 to graph the relationship between the candle's mass and time. Clearly label each axis and include a title.



NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 0

- 6 Describe the pattern (trend) in the mass of the candle over time shown in your graph. Compare your graph to Graph 1. Use specific data in your comparison.

Elaine's graph line goes up while mine goes down. Her line is straight but mine is kind of crooked. Mine is sort of like stairs. She counted her mass by 2's and I counted mine by 10's. Our titles are also different.

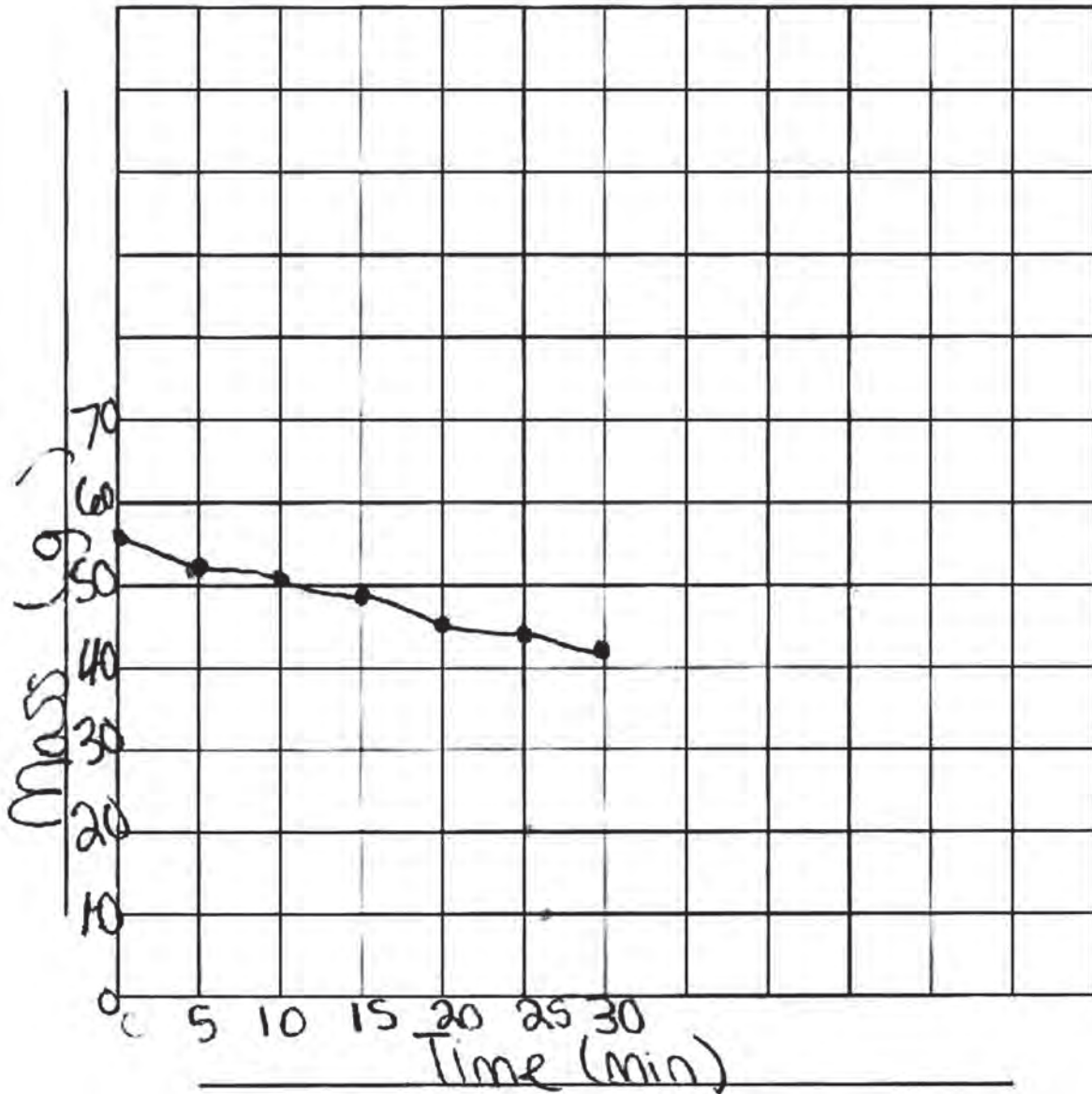
The response includes a comparison of how the actual graphs look without discussing the trend of the mass of the candle over time.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 0 (CONTINUED)

- 5 Use the information in Data Table 3 to graph the relationship between the candle's mass and time. Clearly label each axis and include a title.

Relationship of candle mass and time



**NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE**

**Broad Area of Inquiry:** Developing and Evaluating Explanations  
**Inquiry Construct 11:** Analyze data, including determining if data are relevant, artifact, irrelevant, or anomalous.

- 7 Explain why the mass of the candle changed over time. Use specific information from the investigation to support your answer.

**Scoring Guide**

<b>Score</b>	<b>Description</b>
<b>2</b>	The response provides a general understanding of why the candle mass decreased over time and includes specific information from the investigation to support the answer.
<b>1</b>	The response provides a limited understanding of why the candle mass decreased over time.
<b>0</b>	The response does not contain any correct elements or is irrelevant.
<b>Blank</b>	No response

**Training Notes:**

The candle was burned in an “open system” so that smoke and gases could escape into the room. In the investigation, only the mass of the candle was measured, not the mass of the gas or smoke given off from the candle.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 2

- 7 Explain why the mass of the candle changed over time. Use specific information from the investigation to support your answer.

The mass of the candle changed because it was out in the open, and nothing was combined with it. For example, in the investigation powder X and water were combined, and so were the masses, and the plastic bag caught whatever escaped. While the candle was burned, nothing was added to it to gain any mass, and anything the candle was giving off was being let out into the air, because nothing covered it.

The response provides a general understanding of why the mass of the candle decreased over time and includes specific information from the investigation for support ("was out in the open" and "the plastic bag caught whatever escaped").

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 1

- 7 Explain why the mass of the candle changed over time. Use specific information from the investigation to support your answer.

The candle changed over time because when the fire burned the candle a chemical reaction happened and the mass of the candle changed as more wax was being burned.

The response provides a limited understanding of the chemical reaction and why the mass of the candle decreased over time. The response does not include specific information from the investigation for support.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 0

- 7 Explain why the mass of the candle changed over time. Use specific information from the investigation to support your answer.

The candle was melting and this was increasing the mass as it because it was shrinking and coming together

The response does not demonstrate understanding ("The candle was melting...increasing the mass").

**NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE**

**Broad Area of Inquiry:** Developing and Evaluating Explanations

**Inquiry Construct 11:** Analyze data, including determining if data are relevant, artifact, irrelevant, or anomalous.

- 8 Use what you learned from the burning candle experiment to explain why your results from the Powder X investigation were similar to or different from the results of the two students who left their bags open. Use evidence to support your explanation.

**Scoring Guide**

Score	Description
2	The response provides a general explanation for the difference or similarity in the results for the Powder X investigation with the results for the students who left their bag open and used what was learned in the burning candle investigation to support the answer.
1	The response provides a limited explanation for the difference or similarity in the results for the Powder X investigation with the results for the students who left their bag open and may or may not use what was learned in the burning candle investigation to support the answer.
0	The response does not contain any correct elements or is irrelevant.
Blank	No response

**Training Notes:**

Note: This response may be very similar to the response for question #4.

My results were different from the results for the students who left their bag open. My results showed no change in mass because I did my experiment in a closed system. The CO<sub>2</sub> produced in my bag was trapped because my bag was sealed. The students with the open bag had an open system like the burning candle and their results showed a decrease/increase in mass. The CO<sub>2</sub> in the open bag probably escaped which explains why the other students showed a decrease in mass. OR Air from outside the bag reacted with the powder so the open bag showed an increase in mass.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 2

- 8 Use what you learned from the burning candle experiment to explain why your results from the Powder X investigation were similar to or different from the results of the two students who left their bags open. Use evidence to support your explanation.

The students who left their bags open were like the burning candle. The gases being created had originally been part of the mass, but since they were not captured, they were not weighed, therefore the original mass is more than the mass after mixing. When I did my experiment, all of the gases were contained, so the mass was the same before and after mixing.

The response includes a general explanation of the difference in the results of the Powder X investigation compared to the results for the students who left their bag open and the results of the burning candle investigation.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 2 (CONTINUED)

Data Table 1: Mass Differences and Observations

Investigation	Average Difference in Mass (Number of Washers)
Powder X and water	

In the box below, copy your observations from "After Mixing with Water" from page 9 in your Inquiry Booklet.

After Mixing with Water

Trial 1	Powder X fizzed when the water hit it. The mix turned white, but as the powder X dissolved it turned clear. The mix was cold and bubbly until it turned clear.
Trial 2	
Trial 3	

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 1

- 8 Use what you learned from the burning candle experiment to explain why your results from the Powder X investigation were similar to or different from the results of the two students who left their bags open. Use evidence to support your explanation.

Maybe it is different. because they lost the gas  $\text{CO}_2$  because the bag was open. Unlike mine that was closed keeping the gas in.

The response provides a limited explanation of the difference between the results of the Powder X investigation and the results for the students who left their bag open. There was no reference to the burning candle investigation.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 1 (CONTINUED)

Data Table 1: Mass Differences and Observations

Investigation	Average Difference in Mass (Number of Washers)
Powder X and water	0

In the box below, copy your observations from “After Mixing with Water” from page 9 in your Inquiry Booklet.

After Mixing with Water

Trial 1	<ul style="list-style-type: none"><li>•fizzy</li><li>•bubbles</li><li>•some x on the bottom</li><li>•cold</li><li>•weird smell</li></ul>
Trial 2	<ul style="list-style-type: none"><li>•fizzier</li><li>•white water</li><li>•colder</li></ul>
Trial 3	Same

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 0

- 8 Use what you learned from the burning candle experiment to explain why your results from the Powder X investigation were similar to or different from the results of the two students who left their bags open. Use evidence to support your explanation.

The burning candle experiment and the powder x investigation are different because in the candle experiment the mass increased as the time increased and in the powder x investigation the mass stayed the same at all times.

The response does not explain why the results of the Powder X investigation were similar to or different than the results for the students who left their bag open. The response also discusses an **increase** in mass in the candle experiment, which is incorrect.

NECAP 2010 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 0 (CONTINUED)

Data Table 1: Mass Differences and Observations

Investigation	Average Difference in Mass (Number of Washers)
Powder X and water	0

In the box below, copy your observations from "After Mixing with Water" from page 9 in your Inquiry Booklet.

After Mixing with Water

Trial 1	AS soon as we mixed the water with powder X, it started to sizzle. The substance was bubbling. I think oxygen in the air has something to do with it's bubbling.
Trial 2	Same thing happened in trial 1.
Trial 3	Same thing happened in trial's 1 and 2.