



**NEW ENGLAND
COMMON ASSESSMENT PROGRAM**

**Released Items
Support Materials
2013**

**Grade 8
Science**

**NECAP 2013 RELEASED ITEMS
GRADE 8 SCIENCE**

Grade 8 Science Released Item Information

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

Grade 8 Science Released Inquiry Task Information

Item Number	Big Idea ¹	Inquiry Construct	Depth of Knowledge Code	Item Type ²	Total Possible Points
1	INQ	6	2	SA	2
2	INQ	10	2	CR	3
3	INQ	12	3	SA	2
4	INQ	2	2	CR	3
5	INQ	9	2	SA	2
6	INQ	13	2	SA	2
7	INQ	13	2	SA	2
8	INQ	12	3	SA	2

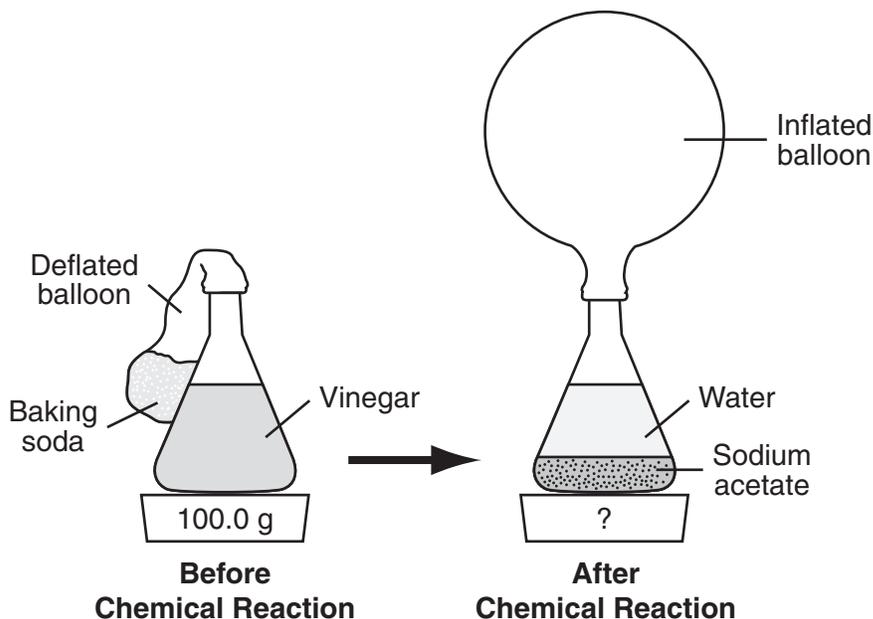
¹Big Idea: NOS = Nature of Science, SAE = Systems and Energy, MAS = Models and Scale, POC = Patterns of Change, FAF = Form and Function, INQ = Scientific Inquiry

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

NECAP 2013 RELEASED ITEMS
GRADE 8 SCIENCE

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).

- 1 The diagrams below show an experiment in which baking soda and vinegar are combined.



Before the chemical reaction the mass of the entire system is 100.0 grams.

What is the **most likely** mass of the system after the chemical reaction?

- A. 0.0 g
- B. 90.0 g
- C. 100.0 g
- D. 101.0 g

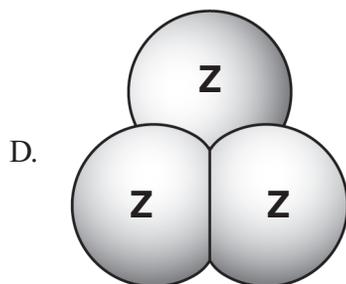
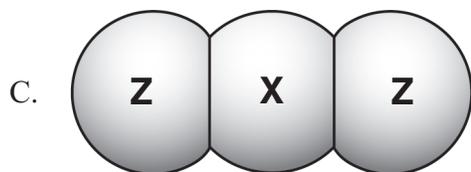
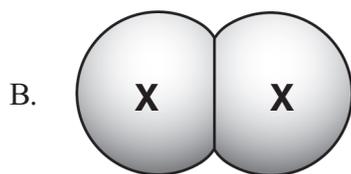
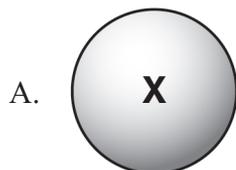
PS1 (5-8) SAE-4 Students will represent or explain the relationship between or among energy, molecular motion, temperature, and states of matter.

- 2 Which example represents a substance changing state from a gas to a liquid?
- A. ice cubes melting into liquid water
 - B. water vapor cooling and forming droplets in a cloud
 - C. hydrogen and oxygen gases reacting and producing liquid water
 - D. water puddles evaporating when exposed to sunlight

NECAP 2013 RELEASED ITEMS
GRADE 8 SCIENCE

PS1 (5-8) MAS-5 Students will, given graphic or written information, classify matter as atom/molecule or element/compound (not the structure of an atom).

- 3 Which diagram represents a chemical compound?



**NECAP 2013 RELEASED ITEMS
GRADE 8 SCIENCE**

ESS1 (5-8) SAE-2 Students will explain the processes that cause the cycling of water into and out of the atmosphere and their connections to our planet's weather patterns.

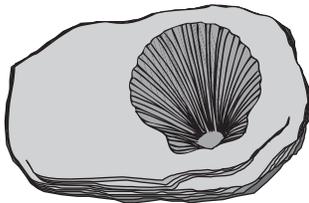
- 4 A student fills a jar halfway with water and covers the jar with plastic wrap. After a few days, the student observes moisture on the inside surface of the plastic wrap.

Which processes are being modeled?

- A. water currents rising and sinking in a lake
- B. different forms of precipitation falling and seeping into the ground
- C. plant roots absorbing water and plant leaves releasing water vapor
- D. water evaporating from a lake and water vapor condensing in the atmosphere

ESS1 (5-8) INQ-5 Students will, using data about a rock's physical characteristics, make and support an inference about the rock's history and connection to rock cycle.

- 5 The rock shown below contains a shell fossil.



Which process describes how the rock formed?

- A. Solid rock was heated.
- B. Molten rock was cooled.
- C. Rock was heated and compressed.
- D. Layers of silt and sand were compacted.

**NECAP 2013 RELEASED ITEMS
GRADE 8 SCIENCE**

ESS2 (5-8) SAE-8 Students will explain temporal or positional relationships between or among the Earth, Sun, and Moon (e.g. night/day, seasons, year, tides) OR how gravitational force affects objects in the solar system (e.g., moons, tides, orbits, satellites).

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

- 6 An object is weighed on Earth. The object is then moved to Mars. How will its weight be affected?
- A. Its weight will be zero.
 - B. Its weight will increase.
 - C. Its weight will be the same.
 - D. Its weight will decrease but not to zero.

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

- 7 The table below lists data about some moons of the solar system.

Some Moons of the Solar System

Name	Parent Planet	Orbital Period (Earth days)	Radius (km)	Mass Relative to Earth's Moon	Density (kg/m ³)
Moon	Earth	27.30	1740	1.00	3300
Callisto	Jupiter	16.70	2400	1.46	1800
Europa	Jupiter	3.55	1570	0.65	3000
Ganymede	Jupiter	7.15	2630	2.02	1900
Io	Jupiter	1.77	1820	1.22	3500
Titan	Saturn	16.00	2580	1.83	1900

- a. Identify two **moons** from the table that could be the **most** similar to Earth's moon. Use specific data from the table to explain your answer.
- b. Compare the orbital periods of Jupiter's moons (shown in the table) with the orbital period of Saturn's moon Titan.

**NECAP 2013 RELEASED ITEMS
GRADE 8 SCIENCE**

Scoring Guide

Score	Description
4	The response demonstrates a thorough understanding of comparing and contrasting planets based on data. The response identifies and uses specific data from the table to identify two moons that could be the most similar to Earth's moon. The response also compares the orbital periods of Jupiter's moons with the orbital period of Titan.
3	The response demonstrates a general understanding of comparing and contrasting planets based on data. The overall response is general.
2	The response demonstrates a limited understanding of comparing and contrasting planets based on data. The overall response is limited.
1	The response demonstrates a minimal understanding of comparing and contrasting planets based on data. The overall response is minimal.
0	The response is incorrect or irrelevant to the concept or skill being measured.
Blank	No response

Training Notes:

A thorough understanding can be exemplified by the following sample responses:

a. Possible similar moons may include one of the following comparisons:

- Io and Europa have similar densities as Earth's moon (Moon = 3300 kg/m^3 , Io = 3500 kg/m^3 , Europa = 3000 kg/m^3).
- Europa and Io have similar radii as Earth's moon (Moon = 1740 km, Europa = 1570 km, Io = 1820 km).
- Titan and Callisto have long orbital periods like Earth's moon (Moon = 27.30 Earth days, Titan = 16.00 Earth days, Callisto = 16.70 Earth days).

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

- b. At least three of Jupiter's moons (Europa, Ganymede, and Io) have a shorter orbital period than Titan, and at least one of Jupiter's moons (Callisto) has a longer orbital period than Titan.

Note: Students do not need to include names of moons for full credit.

NECAP 2013 RELEASED ITEMS
GRADE 8 SCIENCE

SCORE POINT 4

- 7 a) Two moons similar to Earth's moon are Io and Europa. Io and Earth's moon have almost the same density, Earth's moon is 3306 and Io is 3500 . Also, they have very close radii. Io's is 1820 km and the Moon is 1740 km. Europa has the closest orbital period to the moon than all the others. It has a similar radius in size, 1570 and the moon is 1740 . The density of Europa is only 300 kg/m^3 less than the moon. Its density is 3000 kg/m^3 and the Earth's moon is 3300 kg/m^3 .
- b) One of Jupiter's moons, Callisto has a orbital period about the same as Titan. Callisto's orbital period is 16.70 days and Titan's is 16.00 days. Jupiter's other moons have a much shorter orbital period than Titan's though. Europa is 3.55 days, Ganymede is 7.15 days and Io is 1.77 days. All are much less than Titan's 16.00 days.

Identifies two moons and uses specific information from the table (density, radii and orbital periods). In part b, the response uses data from the table to compare the orbital period of Titan to Callisto [it is "about the same"] and to Jupiter's other moons [it is "much shorter"].

NECAP 2013 RELEASED ITEMS
GRADE 8 SCIENCE

SCORE POINT 3

7
a.) A moon that is most similar to Earth's moon is Io because it has nearly the same radius, mass, and density. Another moon that is most similar to Earth's moon is Europa because it has almost the same radius and density.

b.) Jupiters' moons compared to Saturn's:

Callisto - .7 days more than Titan

Europa - 12.45 days less than Titan

Ganymede - 8.85 days less than Titan

Io - 14.23 days less than Titan

Titan - 16.00 Earth days

Response selects Io and cites unspecified similarities in radii, mass and density, and selects Europa because of unspecified similarities in radii and density. Part b provides data which generally compares the orbital periods of each of Jupiter's moons with the orbital period of Titan.

NECAP 2013 RELEASED ITEMS
GRADE 8 SCIENCE

SCORE POINT 2

79. Europa and IO because they're close in density and radius.

B. Except for Callisto, Titan has the longest orbital period.

Response is correct but is not justified with specific data from the table in either part.

7

A. The most similar moon to Earth's moon is Europa and Io because there not that far apart from each other and there a relationship in them.

B. ALL of Jupiters moon are all either to much or to little or to high or to low Jupiturer doesn't have a balance.

There is a vague reference to the table in both parts a and b, but the response does not specify what data or information is being used in coming to these conclusions.

SCORE POINT 0

7 a. Ganymede and Titan moons because they have the most mass that is relative to Earth's moon.

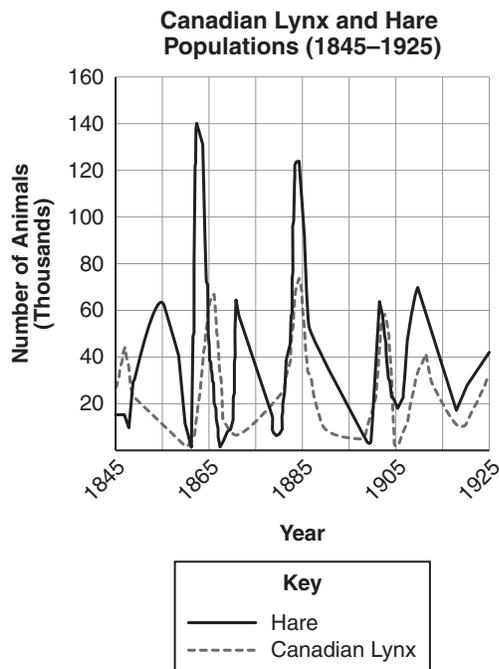
b. The orbital periods of Jupiters moons aren't a specific time which means that they all work together in order to orbit around Jupiter. The orbital period of Saturn's moon is exactly good enough to orbit around Saturn.

Incorrect.

NECAP 2013 RELEASED ITEMS
GRADE 8 SCIENCE

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 The Canadian lynx is a small wildcat that eats mostly hares. Hares are similar to rabbits. The graph below compares the Canadian lynx and hare populations in an ecosystem from 1845 through 1925.



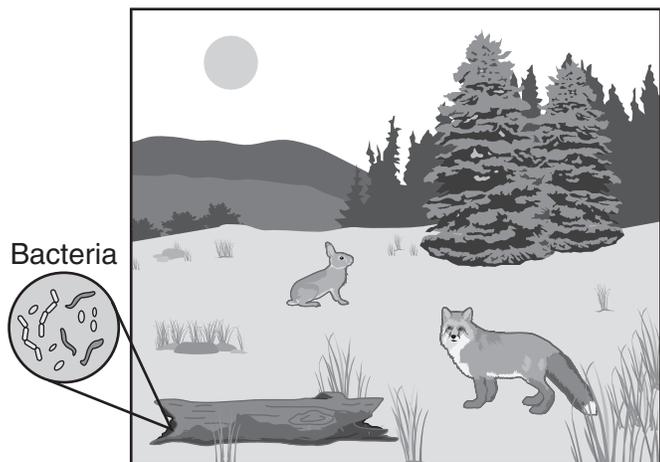
Based on the graph, which sentence describes one possible relationship between the Canadian lynx and the hare populations?

- A. If the population of hares were to suddenly increase, the Canadian lynx would likely become extinct.
- B. If another predator of the hares were introduced into the ecosystem, the population of Canadian lynx would suddenly increase.
- C. If the Canadian lynx began to eat other types of mammals, the population of hares would suddenly decrease.
- D. If the Canadian lynx were suddenly removed from the ecosystem, the population of hares would likely increase.

NECAP 2013 RELEASED ITEMS
GRADE 8 SCIENCE

LS2 (5-8) SAE-6 Students will, 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 An example of an ecosystem is shown below.



How does some of the energy flow through the ecosystem?

- A. from the grass to the rabbit
- B. from the grass to the Sun
- C. from the fox to the rabbit
- D. from the bacteria to the fox

**NECAP 2013 RELEASED ITEMS
GRADE 8 SCIENCE**

LS4 (5-8) INQ-10 Students will use data and observations to support the concept that environmental or biological factors affect human body systems (biotic & abiotic).

- 10** Cigarette smoking narrows the smoker's blood vessels. Blood carries oxygen that is needed by organs to function properly.

Which prediction is **most likely** to occur in someone who smokes cigarettes?

- A. The smoker's heart will pump blood more slowly because the blood will take up more space in the blood vessels.
- B. The smoker will have less blood move through the blood vessels because the blood vessels will get larger.
- C. The smoker's lungs will need to take in less oxygen because oxygen levels will increase in the body.
- D. The smoker's cells will become damaged because they will receive less oxygen.

**NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE**

Broad Area of Inquiry: Inquiry Construct 6:	Planning and Critiquing of Investigations Provide reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation.
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- 1 Explain why it was important to conduct multiple trials and to use the average of those trials to calculate the average density.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of the reasons for appropriateness of procedures used in the investigation. The response clearly explains the importance of conducting multiple trials to measure the mass and volume of the objects during the investigation and using the averages of those trials for calculating average density.
1	The response demonstrates a limited understanding of the reasons for appropriateness of procedures used in the investigation.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

- Multiple trials can provide more valid results than a single measurement because of measurement error.
- Anomalous or incorrect measurements are more likely to be identified when multiple trials are conducted.
- The averages from multiple trials can more accurately represent the measurements of an object to be used in a calculation than a single measurement.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 2

- 1 Explain why it was important to conduct multiple trials and to use the average of those trials to calculate the average density.

It is important to conduct multiple trials just in case you make an error on one of them or get a wrong measurement. It is important to use the average because picking one out of three numbers could be incorrect.

Both parts of the prompt are answered correctly.

SCORE POINT 1

- 1 Explain why it was important to conduct multiple trials and to use the average of those trials to calculate the average density.

Just so we can make sure many times that the data is accurate

Answers only one part of the prompt (why it is important to conduct multiple trials). The response does not address the importance of using averages.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 0

- ① Explain why it was important to conduct multiple trials and to use the average of those trials to calculate the average density.

Its important because you can review or see
whats going to happen next in the experiment.

Incorrect.

**NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE**

Broad Area of Inquiry: Inquiry Construct 10:	Conducting Investigations Summarize results based on data.
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- 2 Compare the average densities of the coin and nugget from your investigation (Data Table 1) with the densities of substances listed in Data Table 2. Identify the substances that **most likely** make up the coin and nugget. Support your answer with data from both tables.

Scoring Guide

Score	Description
3	The response demonstrates a thorough understanding of summarizing results based on data. The response correctly identifies the types of metal that most likely make up the coin and the nugget and provides data from Data Tables 1 and 2 as support.
2	The response demonstrates a general understanding of summarizing results based on data.
1	The response demonstrates a limited understanding of summarizing results based on data.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

- The metal that most likely makes up the coin and nugget is pyrite. The density of my coin and nugget were [*student's data*] and most closely matches the density of pyrite in Data Table 2 (5.0 g/cm³).
- Correct units need to be included for a 3-point score.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 3

- 2 Compare the average densities of the coin and nugget from your investigation (Data Table 1) with the densities of substances listed in Data Table 2. Identify the substances that **most likely** make up the coin and nugget. Support your answer with data from both tables.

The coin and nugget are most likely made of pyrite. Pyrite has a density of 5.0 g/cm^3 . The coin and nugget have densities of 6.4 g/cm^3 and 4 g/cm^3 . While both substances are at least 1.0 g/cm^3 more or less dense, they are relatively close to pyrite's density. Also, they are much closer to pyrite than they are for any of the other substances listed in the chart.

Response uses specific data (with correct units) from both tables to compare the densities of the objects found on the beach with the known densities of a variety of metals. The response also comes to a valid conclusion based on the data.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 3 (CONTINUED)

Data Table 1: Average Mass, Volume, and Density of Found Objects

Object	Average Mass (g)	Average Volume (mL)	Average Density (g/cm ³)
Coin	8.3g	1.3mL	6.4g/cm ³
Nugget	12g	3mL	4g/cm ³

Note: 1 cm³ = 1 mL

Jennifer's science teacher helped her research the densities of various substances. Data Table 2, below, shows the results of their research.

Data Table 2: Densities of Various Substances

Substance	Density (g/cm ³)
Aluminum	2.7
Brass	8.4–8.7
Copper	8.9
Gold	19.3
Pyrite	5.0
Silver	10.5

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 2

- 2 Compare the average densities of the coin and nugget from your investigation (Data Table 1) with the densities of substances listed in Data Table 2. Identify the substances that **most likely** make up the coin and nugget. Support your answer with data from both tables.

The data from both tables suggests that the two items are made of pyrite. Both densities among this make a more accurate conclusion because both are set up in the 4.0-4.5-5.0 gram density that the metals share in significance with each other.

The response comes to a valid conclusion [both items are made of pyrite]. However, it is unclear how the data cited relates to the conclusion and the unit of measurement used (gram) is incorrect.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 2 (CONTINUED)

Data Table 1: Average Mass, Volume, and Density of Found Objects

Object	Average Mass (g)	Average Volume (mL)	Average Density (g/cm ³)
Coin	8 (g)	2 (ml)	4 (g/cm ³)
Nugget	19.3 (g)	4.6 (ml)	4.5 (g/cm ³)

Note: 1 cm³ = 1 mL

Jennifer's science teacher helped her research the densities of various substances. Data Table 2, below, shows the results of their research.

Data Table 2: Densities of Various Substances

Substance	Density (g/cm ³)
Aluminum	2.7
Brass	8.4–8.7
Copper	8.9
Gold	19.3
Pyrite	5.0
Silver	10.5

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 1

- 2 Compare the average densities of the coin and nugget from your investigation (Data Table 1) with the densities of substances listed in Data Table 2. Identify the substances that **most likely** make up the coin and nugget. Support your answer with data from both tables.

The substance that most likely makes up the coin is aluminum and the substance of the nugget is probably pyrite.

This response comes to a correct conclusion based on experimental results but it is not backed up with evidence from the tables.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 1 (CONTINUED)

Data Table 1: Average Mass, Volume, and Density of Found Objects

Object	Average Mass (g)	Average Volume (mL)	Average Density (g/cm ³)
Coin	8.6 g	1.833 mL	11.69%
Nugget	13.66 g	3.3 mL	4.12%

Note: 1 cm³ = 1 mL

Jennifer's science teacher helped her research the densities of various substances. Data Table 2, below, shows the results of their research.

Data Table 2: Densities of Various Substances

Substance	Density (g/cm ³)
Aluminum	2.7
Brass	8.4–8.7
Copper	8.9
Gold	19.3
Pyrite	5.0
Silver	10.5

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 0

- 2 Compare the average densities of the coin and nugget from your investigation (Data Table 1) with the densities of substances listed in Data Table 2. Identify the substances that **most likely** make up the coin and nugget. Support your answer with data from both tables.

The substances that most likely makeup the coin and nugget is the average from both Data tables. we had to divide the number from the trials then divide them by a certain number.

Irrelevant to the question asked.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 0 (CONTINUED)

Data Table 1: Average Mass, Volume, and Density of Found Objects

Object	Average Mass (g)	Average Volume (mL)	Average Density (g/cm ³)
Coin	7R2	1 mL	7R2
Nugget	2R2	1 mL	2R2

Note: 1 cm³ = 1 mL

Jennifer's science teacher helped her research the densities of various substances. Data Table 2, below, shows the results of their research.

Data Table 2: Densities of Various Substances

Substance	Density (g/cm ³)
Aluminum	2.7
Brass	8.4–8.7
Copper	8.9
Gold	19.3
Pyrite	5.0
Silver	10.5

**NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE**

Broad Area of Inquiry: Inquiry Construct 12:	Developing and Evaluating Explanations Use evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis.
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3 Copy your prediction from page 3 of your Inquiry Booklet into the box below.

- a. Is your prediction supported by the evidence from your investigation and Jennifer’s research?
- b. Use specific evidence from your investigation and Jennifer’s research to explain your answer.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of using evidence to support and justify interpretations and conclusions or explains how the evidence refutes the hypothesis. The response identifies whether the student’s prediction was supported or rejected by the evidence, explains why, and includes specific pieces of evidence.
1	The response demonstrates a limited understanding of using evidence to support and justify interpretations and conclusions or explains how the evidence refutes the hypothesis.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

The evidence supports my prediction because after calculating the densities of the objects from the beach, I compared the densities with the data in Data Table 2 to identify the type of substance each object was made from.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 2

3 Copy your prediction from page 3 of your Inquiry Booklet into the box below.

I don't think the property of density alone can be used to determine the identity of an object

- Is your prediction supported by the evidence from your investigation and Jennifer's research?
- Use specific evidence from your investigation and Jennifer's research to explain your answer

I believe my prediction is supported by Jennifer's research. The density of both the coin and the nugget are very close. The density of the coin was 4.5 g/cm^3 and the density of the nugget was 5 g/cm^3 . There is one substance, Pyrite, that has a density of 5 g/cm^3 . Now, we know most likely the objects aren't made of the same substance, this being said it is the only substance with a close density to both of them. This shows that there is not enough information using just density to determine the identity of an object.

The response clearly states that the prediction is supported and provides specific evidence and rationale to back up the claim. Correct units of measurement are used.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 1

3 Copy your prediction from page 3 of your Inquiry Booklet into the box below.

Yes, the property of density alone can determine the identity of an object.

- Is your prediction supported by the evidence from your investigation and Jennifer's research?
- Use specific evidence from your investigation and Jennifer's research to explain your answer

(A) Yes my prediction is supported.

(B) The prediction is supported because when my group found the density I used Jennifer's research of the other metals densities to find the metal that matched our density to get the name of the metal.

The response clearly states the prediction is supported. The response provides rationale but does not include specific evidence to back up the claim.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 0

- 3 Copy your prediction from page 3 of your Inquiry Booklet into the box below.

Yes, because if it is a really heavy object
you can assume that it is going to be a heavy
more dens object

- a. Is your prediction supported by the evidence from your investigation and Jennifer's research?

kind of not really

- b. Use specific evidence from your investigation and Jennifer's research to explain your answer

well it shows that all the heavier objects
have a bigger density and that goes along
with my prediction

Incorrect.

**NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE**

Broad Area of Inquiry:	Formulating Questions & Hypothesizing
Inquiry Construct 2:	Construct coherent argument in support of a question, hypothesis, prediction.

- 4 A student in the science class said that his density investigation of the coin “**proved**” that the coin came from the shipwreck. Do you agree or disagree with the student’s statement? Explain the reasoning for your answer.

Scoring Guide

Score	Description
3	The response demonstrates a thorough understanding of constructing a coherent argument in support of a question, hypothesis, or prediction. The response clearly identifies and describes whether the scientific claim is proven by the evidence.
2	The response demonstrates a general understanding of constructing a coherent argument in support of a question, hypothesis, or prediction.
1	The response demonstrates a limited understanding constructing a coherent argument in support of a question, hypothesis, or prediction.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

- The coin might be brass because it has the same density as brass, but density is only one test and other tests should be used to verify that the coin is brass.
- The coin might have come from the shipwreck because the ship had coins, but the coin could have come from something else too.
- Scientists can provide evidence that supports a claim but cannot prove the claim is absolutely true because there might be other evidence that contradicts the claim.
- One student's answer is not sufficient.
- He didn't cite the evidence.
- Just because the object is found in the same location as other objects does not mean they all come from the same place.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 3

Analyzing Your Results

Jennifer's history teacher helped her research information about the types of metals and objects that may have been on the *Gaspee* before the ship was burned. Data Table 3, below, shows the results of their research.

Data Table 3: Types of Metals and Objects Likely Found on the Ship

Type of Metal	Objects Commonly Made from the Metal
Brass	locks, keys, hinges, lamps
Copper	pots, pans
Gold	coins, nuggets
Silver	coins, spoons, knives, and forks

- 4 A student in the science class said that his density investigation of the coin “proved” that the coin came from the shipwreck. Do you agree or disagree with the student’s statement? Explain the reasoning for your answer. I don't agree with the student's statement because the information found in the investigation only proved the density of the objects. By only finding the density you wouldn't be able to prove if the objects are from the shipwreck or not until you found it's identity. Since it was closest to pyrite and that isn't listed it might not have been from the shipwreck.

The response clearly indicates disagreement and presents a well reasoned argument that other factors must be taken into account before a final determination can be made.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 2

Analyzing Your Results

Jennifer's history teacher helped her research information about the types of metals and objects that may have been on the *Gaspee* before the ship was burned. Data Table 3, below, shows the results of their research.

Data Table 3: Types of Metals and Objects Likely Found on the Ship

Type of Metal	Objects Commonly Made from the Metal
Brass	locks, keys, hinges, lamps
Copper	pots, pans
Gold	coins, nuggets
Silver	coins, spoons, knives, and forks

- 4 A student in the science class said that his density investigation of the coin “**proved**” that the coin came from the shipwreck. Do you agree or disagree with the student’s statement? Explain the reasoning for your answer.

I disagree with him. There were coins on the ship but they were from different types of metal like silver and gold. The coin Jennifer found was most likely made from Pyrite.

The response clearly indicates disagreement. The explanation is brief, comparing the coins based only on the types of metals.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 1

Analyzing Your Results

Jennifer's history teacher helped her research information about the types of metals and objects that may have been on the *Gaspee* before the ship was burned. Data Table 3, below, shows the results of their research.

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- 4 A student in the science class said that his density investigation of the coin “**proved**” that the coin came from the shipwreck. Do you agree or disagree with the student’s statement? Explain the reasoning for your answer.

I disagree because there is no way to show that it came from the shipwreck just by finding the coins density.

The response clearly indicates disagreement but the argument is minimal, focusing only on density.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 0

Analyzing Your Results

Jennifer's history teacher helped her research information about the types of metals and objects that may have been on the *Gaspee* before the ship was burned. Data Table 3, below, shows the results of their research.

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- 4 A student in the science class said that his density investigation of the coin “**proved**” that the coin came from the shipwreck. Do you agree or disagree with the student’s statement? Explain the reasoning for your answer.

I agree with the students investigation.
I agree because in the data table
Jennifer's history teacher gave her, it
say under Gold and silver that coins
and nuggets were in there.

Incorrect.

**NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE**

Broad Area of Inquiry:	Conducting Investigations
Inquiry Construct 9:	Collect sufficient data to study question, hypothesis, or relationships.

5 Explain why it is important for scientists to retest other scientists' experiments.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of collecting sufficient data to study a question, a hypothesis, or relationships. The response clearly explains why the scientist independently measured the mass and volume of the objects to calculate the density.
1	The response demonstrates a limited understanding of collecting sufficient data to study a question, a hypothesis, or relationships.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

- Scientists conduct independent investigations to verify the results of prior investigations.
- Scientists conduct independent investigations to make sure the scientist was correct.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 2

- 5 Explain why it is important for scientists to retest other scientists' experiments.

It's important for scientists to retest other scientists' experiments because it further eliminates the possibility of human error. If one scientist messes up an experiment, then the results are not accurate. By having another scientist do the experiment, they can compare and decide if there was a mistake or not.

A well reasoned response that explains that an error may occur and how retesting may identify that error.

SCORE POINT 1

- 5 Explain why it is important for scientists to retest other scientists' experiments.

It is important for scientist to retest other scientists experiments because the first scientist could have made a mistake and not realized it.

A correct, but brief, explanation that a mistake could have been made.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 0

- 5 Explain why it is important for scientists to retest other scientists' experiments.

So they can see how old it is.

Incorrect.

**NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE**

Broad Area of Inquiry: Inquiry Construct 13:	Developing and Evaluating Explanations Communicate how scientific knowledge applies to explain results, propose further investigations, or construct and analyze alternative explanations.
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- 6 The scientist’s results were slightly different from Jennifer’s results. Explain why the scientist’s results may have been slightly different from Jennifer’s results.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of communicating how scientific knowledge applies to explain results. The response explains why the scientist’s results may have been slightly different from Jennifer’s results.
1	The response demonstrates a limited understanding of communicating how scientific knowledge applies to explain results.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

- The scientist’s measurements may have differed slightly because the scientist had more accurate measurement instruments or because the condition of the objects had changed slightly from when they were measured by the students.
- There may have been an error introduced into the measurements or calculations by either the students or the scientist.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 2

- 6 The scientist's results were slightly different from Jennifer's results. Explain why the scientist's results may have been slightly different from Jennifer's results.

The scientist's results may have been slightly different from Jennifer's because the scientist may have access to more information and better equipment. If more advanced equipment is used by someone who knows or has more information on the topic when the experiment is performed again, it is more likely to be accurate. The scientist may also be able to detect a mistake more easily.

The response fully explains how different equipment could lead to different experimental results.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 1

- 6 The scientist's results were slightly different from Jennifer's results. Explain why the scientist's results may have been slightly different from Jennifer's results.

The scientist's results may have been different because they may have more advanced equipment.

A brief statement that does not fully explain how the equipment could have affected the results.

SCORE POINT 0

- 6 The scientist's results were slightly different from Jennifer's results. Explain why the scientist's results may have been slightly different from Jennifer's results.

It may have been different because they can find certain things.

Irrelevant.

**NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE**

Broad Area of Inquiry: Inquiry Construct 13:	Developing and Evaluating Explanations Communicate how scientific knowledge applies to explain results, propose further investigations, or construct and analyze alternative explanations.
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7 Describe the pattern shown by the mass, volume, and density of the samples listed in Data Table 4.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of how to communicate how scientific knowledge applies to explain results. The response explains how the information in Data Table 4 supports the idea that the density of an object can be used to identify the composition of each object found on the beach.
1	The response demonstrates a limited understanding of how to communicate how scientific knowledge applies to explain results.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

The pattern is that the density of a sample stays the same, or shows small differences, even if the mass or volume changes.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 2

Applying What You've Learned

Jennifer's science teacher had the class do another investigation with nonmetal objects. They measured the mass and volume of samples that were all made out of the same nonmetal material but had different masses. The average measurements of the samples are shown in Data Table 4, below.

**Data Table 4: Average Mass and Volume of Four Samples
Made of the Same Nonmetal**

Sample	Mass (g)	Volume (cm ³)	Density (g/cm ³)
W	2.2	1.1	2.0
X	5.1	2.3	2.2
Y	11.3	5.4	2.1
Z	14.2	7.1	2.0

- 7 Describe the pattern shown by the mass, volume, and density of the samples listed in Data Table 4.

The pattern shown by the mass, volume, and density of the samples listed in Data Table 4 is the fact that the mass and volume go up with each sample, but the densities stay close to the same.

The response includes a clear description of the pattern and relates density to mass and volume.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 1

Applying What You've Learned

Jennifer's science teacher had the class do another investigation with nonmetal objects. They measured the mass and volume of samples that were all made out of the same nonmetal material but had different masses. The average measurements of the samples are shown in Data Table 4, below.

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Y	11.3	5.4	2.1
Z	14.2	7.1	2.0

- 7 Describe the pattern shown by the mass, volume, and density of the samples listed in Data Table 4.

FOR the four objects, the mass and volume were different but the density remains the same

Response does not clearly relate density to the changes in mass and volume.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 0

Applying What You've Learned

Jennifer's science teacher had the class do another investigation with nonmetal objects. They measured the mass and volume of samples that were all made out of the same nonmetal material but had different masses. The average measurements of the samples are shown in Data Table 4, below.

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Z	14.2	7.1	2.0

- 7 Describe the pattern shown by the mass, volume, and density of the samples listed in Data Table 4.

The pattern is the mass and volume get bigger and bigger, so the density gets bigger and then smaller.

Incorrect.

**NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE**

Broad Area of Inquiry:	Developing and Evaluating Explanations
Inquiry Construct 12:	Use evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis.

- 8 Explain how the pattern you described in question 7 supports the idea that the composition of each object found on the beach could be identified from its density.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of how to communicate how scientific knowledge applies to explain results. The response explains how the pattern described in question 7 supports the idea that the composition of each object found on the beach could be identified from its density.
1	The response demonstrates a limited understanding of how to communicate how scientific knowledge applies to explain results.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

The pattern supports the idea that the composition of each object can be identified from its density because even when different samples with different masses and volumes of the object were measured, the calculated density of the object was the same.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 2

- 8 Explain how the pattern you described in question 7 supports the idea that the composition of each object found on the beach could be identified from its density.

If someone wanted to know what type of substance an object is you would use density and compare it to other research of that substance. It does not matter the size or how much space the object takes up as long as it matches the correct density.

This response thoroughly describes the concept that no matter the mass or volume of a substance, its density remains the same. The response brings in the need for further comparison and research.

- 7 Describe the pattern shown by the mass, volume, and density of the samples listed in Data Table 4.

The data table shows that the densities are very close to one another so they may be the same substance because even though there masses and volumes are different it can still be the same substance. For instance you can have one substance in all shapes and sizes a measure them all out and still have the same density.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 1

- 8 Explain how the pattern you described in question 7 supports the idea that the composition of each object found on the beach could be identified from its density.

This pattern shows that no matter what mass or volume the substance is, the density will always turn out the same.

The response provides a brief, correct statement.

- 7 Describe the pattern shown by the mass, volume, and density of the samples listed in Data Table 4.

The masses and volumes are all different. But all the densities are the same. This shows that they're the same nonmetal substance.
Also, as the mass increases the volume increases.

NECAP 2013 RELEASED INQUIRY TASK
GRADE 8 SCIENCE

SCORE POINT 0

- 8 Explain how the pattern you described in question 7 supports the idea that the composition of each object found on the beach could be identified from its density.

This is because the density never really changed. It went from 2.0 - 2.2 and 2.2 g/cm³ was the highest it went. So it just shows that the mass and volume can change but the density really doesn't.

The response discusses Data Table 4 without relating the information to the broader concept of identifying objects from their density. No credit.

- 7 Describe the pattern shown by the mass, volume, and density of the samples listed in Data Table 4.

The pattern shown by the mass is how it increases by 3 then by 6 and then by 3 again. The pattern for the volume is it goes up by 1 then 3 then down to two. Then the density stayed between 2.0 - 2.2 g/cm³.