



**NEW ENGLAND  
COMMON ASSESSMENT PROGRAM**

**Released Items  
Support Materials  
2014**

**Grade 8  
Science**

**NECAP 2014 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	INQ	PS 1-1	2	MC	D	1
2	INQ	PS 1-2	2	MC	C	1
3	POC	PS 2-6	2	MC	D	1
4	POC	ESS 1-1	2	MC	D	1
5	POC	ESS 1-3	2	MC	D	1
6	POC	ESS 1-5	2	MC	B	1
7	SAE	LS 1-1	2	MC	A	1
8	MAS	LS 3-8	2	MC	D	1
9	POC	LS 4-12	2	MC	B	1
10	INQ	LS 2-5	2	CR		4

**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	2	2	SA	2
2	INQ	11	2	SA	2
3	INQ	12	3	SA	2
4	INQ	6	2	SA	2
5	INQ	8	2	CR	3
6	INQ	4	3	CR	3
7	INQ	2	2	SA	2
8	INQ	5	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

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

- 1 A wooden rod is broken into two equal pieces. The mass and volume of each new piece are exactly half the original rod's mass and volume.

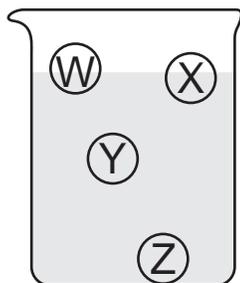
Which statement is true about one of the new pieces?

- A. The new piece has half the original density because it has half the original volume.
- B. The new piece has half the original density because it has half the original mass.
- C. The new piece has the same density as the original rod because it is the same mass as the original rod.
- D. The new piece has the same density as the original rod because it is the same material as the original rod.

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**PS1 (5-8) INQ-2** Given data about characteristic properties of matter (e.g., melting and boiling points, density, solubility), identify, compare, or classify different substances.

- 2 The diagram below shows four objects in a beaker filled with liquid.



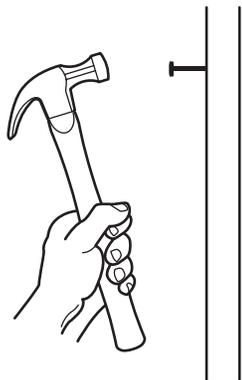
Which object **most likely** has the same density as the liquid in the beaker?

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

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**PS2 (5-8) POC-6** Given a real-world example, show that within a system, energy transfers from one form to another (i.e., chemical, heat, electrical, gravitational, light, sound, mechanical).

- 3 The picture below shows a hammer about to hit a nail.



Which statement describes the mechanical energy of the hammer when it strikes the nail?

- A. The mechanical energy is lost.
- B. The mechanical energy is created.
- C. The mechanical energy equals zero.
- D. The mechanical energy is transferred.

**NECAP 2014 RELEASED ITEMS  
GRADE 8 SCIENCE**

**ESS1 (5-8) POC-1** Use geological evidence provided to support the idea that the Earth's crust/lithosphere is composed of plates that move.

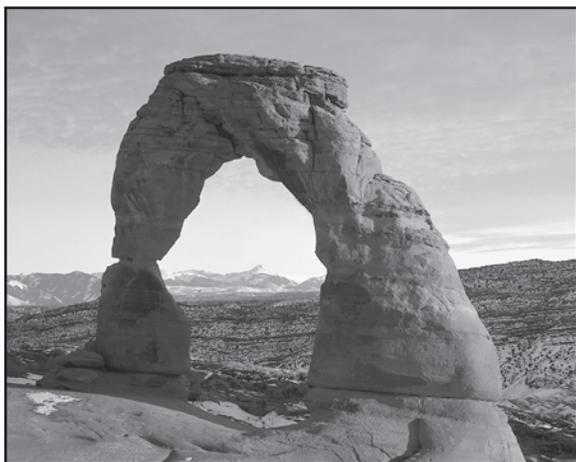
*Use the Plate Movements diagram on the reference sheet to answer the question.*

- 4 At 36,000 feet below sea level, the Mariana Trench is the deepest point in the ocean. Which process formed this trench?
- A. two plates pulling apart from each other
  - B. two plates sliding horizontally past each other
  - C. two plates colliding with each other and both plates pushing upward
  - D. two plates colliding with each other and one plate sliding underneath the other

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**ESS1 (5-8) POC-3** 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 landform in the picture below is located in an area of Utah where the climate has been dry for thousands of years.



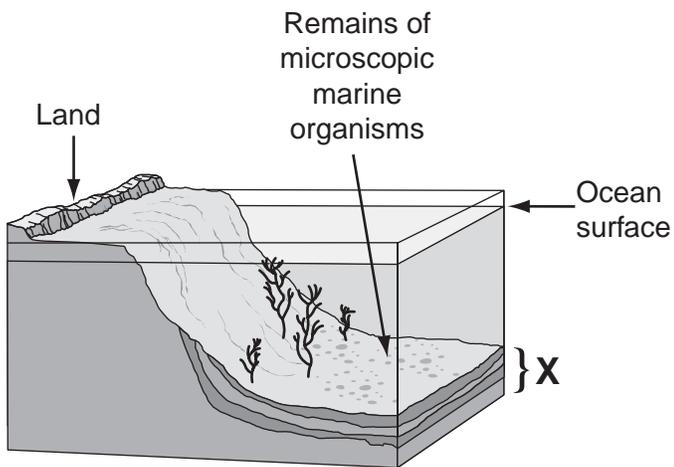
How was the landform **most likely** changed by the environment over time?

- A. Floodwaters quickly washed away large chunks of rock.
- B. Intense sunlight quickly split away small chunks of rock.
- C. Glacial ice slowly carved away the top layers of rock.
- D. Windblown sand slowly chipped away tiny particles of rock.

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

- 6 The diagram below shows layers of ocean floor labeled X.



Which type of rock will eventually form at location X?

- A. extrusive rock, because the layers are on the ocean floor's surface
- B. sedimentary rock, because sediments are continuously being deposited
- C. fine-grained igneous rock, because the sediment is microscopic
- D. layered metamorphic rock, because the ocean floor is layered

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

7 In the 1940s, the Eurasian milfoil was introduced to American waterways. This plant grows fast, crowding out native species in rivers and lakes in nearly every state in the United States.

Which conclusion about introduced species is **most** supported by the Eurasian milfoil example?

- A. Introduced species can dominate and harm an ecosystem's biodiversity and stability.
- B. Introduced species can fit in and benefit an ecosystem's biodiversity and stability.
- C. Introduced species can die out but still damage an ecosystem's biodiversity and stability.
- D. Introduced species can die out and not harm an ecosystem's biodiversity and stability.

**NECAP 2014 RELEASED ITEMS  
GRADE 8 SCIENCE**

**LS3 (5-8) MAS-8** 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).

- 8 A student is classifying an animal using the dichotomous key below. The animal has lungs, scaly skin, and a backbone, and it lays eggs on land.

1. Does the animal have a backbone?
  - a. If yes, go to 2.
  - b. If no, it is an invertebrate.
2. Does the animal have lungs?
  - a. If yes, go to 3.
  - b. If no, it is a fish.
3. Does the animal lay eggs in water?
  - a. If yes, it is an amphibian.
  - b. If no, go to 4.
4. Does the egg develop inside the mother?
  - a. If yes, the animal is a mammal.
  - b. If no, go to 5.
5. Does the animal have scaly skin or feathers?
  - a. If it has feathers, it is a bird.
  - b. If it has scaly skin, it is a reptile.

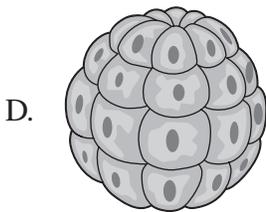
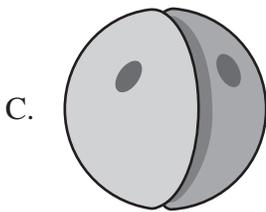
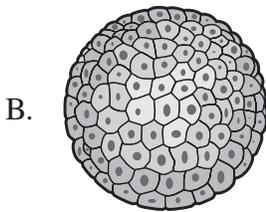
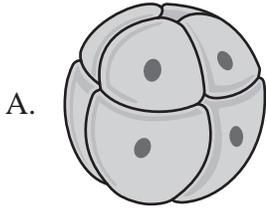
Based on the key, which type of animal is the student classifying?

- A. amphibian
- B. fish
- C. mammal
- D. reptile

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**LS4 (5-8) POC-12** Describe the major changes that occur over time in human development from single cell through embryonic development to new born (i.e., trimesters: 1st - group of cells, 2nd - organs form, 3rd - organs mature).

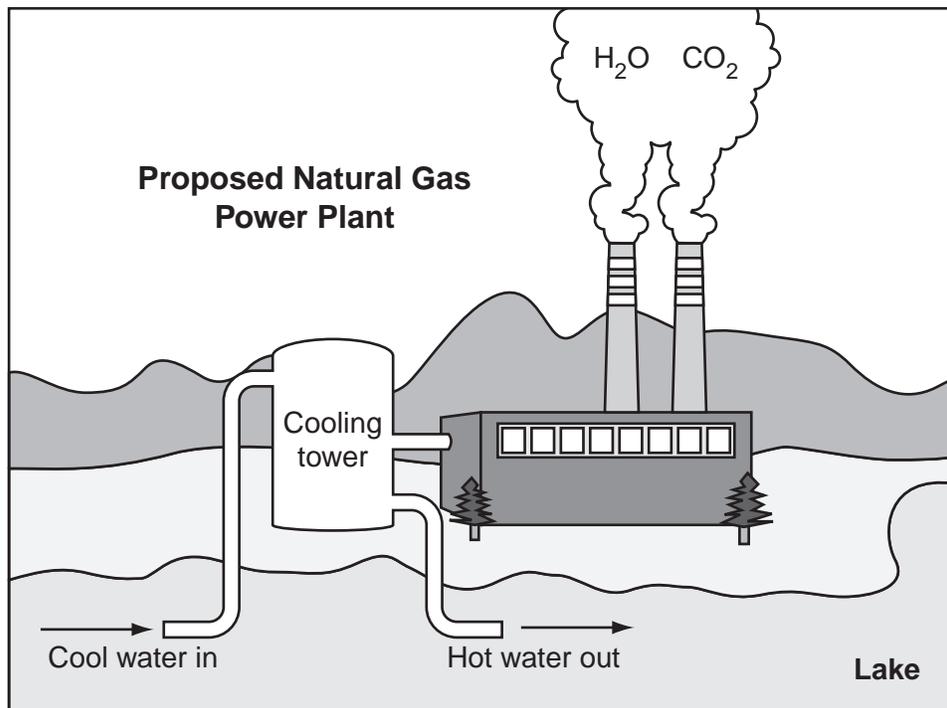
9 Which human embryo is the **most** developed?



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LS2 (5-8) INQ-5 Using data and observations, predict outcomes when abiotic/biotic factors are changed in an ecosystem.

- 10 A utility company has proposed building a natural gas power plant next to a lake. The company claims burning natural gas will release only harmless gases such as water vapor ( $H_2O$ ) and carbon dioxide ( $CO_2$ ), but some environmental scientists disagree. The picture below shows the proposed power plant.



- Explain **one** way the proposed power plant might affect the atmosphere.
- Explain **two** ways the proposed power plant might affect **organisms** in the lake ecosystem.

**NECAP 2014 RELEASED ITEMS  
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**Scoring Guide**

<b>Score</b>	<b>Description</b>
<b>4</b>	Response demonstrates a thorough understanding of how abiotic factors can change an ecosystem. Student provides one explanation of how the proposed plant might affect the atmosphere and two explanations of how the proposed plant might affect the lake ecosystem. The response has no errors or omissions.
<b>3</b>	Response demonstrates a general understanding of how abiotic factors can change the ecosystem. The response has an error or omission.
<b>2</b>	Response demonstrates a limited understanding of how abiotic factors can change the ecosystem. The response has errors and omissions.
<b>1</b>	Response demonstrates a minimal understanding of how abiotic factors can change the ecosystem. The response has several errors and omissions.
<b>0</b>	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
<b>Blank</b>	No response

Part a. (2 holistic points):

- Carbon dioxide is a greenhouse gas. Its emission may contribute to global warming and may lead to climate changes in many regions of the world.
- Particulates (smoke) will be added to the air. This may cause more fog and clouds to form.
- Other chemicals may be released that might pollute the air or cause acid rain.
- Note: just mentioning “there are greenhouse gases” isn’t sufficient for full credit. There needs to be a verb that indicates a change takes place.
- Note: students may argue for a positive effect with justification (for partial credit).

Part b. (2 holistic points for each explanation):

- Warm water can cause massive fish kills when the released water is too hot for the fish to tolerate.
- Warm water holds less oxygen than cool water. Some aquatic organisms might die due to the lack of oxygen.
- The loss of small organisms will reduce the food supply for the fish, thus affecting the entire ecosystem.
- Fish and other large organisms might be trapped by the screens in the water inlet pipes.

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- Smaller organisms that go through the screens in the inlet pipes will most certainly be killed by the high temperature of the tower.
- Warmer water will increase the respiration rates of aquatic organisms and the consumption of already depleted oxygen.
- Warmer water can increase fishes' and other organisms' susceptibility to disease, parasites, and toxic chemicals.
- Warmer water might adversely affect spawning and kill young fish.
- Fish might be larger but have a shorter life span.

Point Conversion:

- 6 points = 4
- 4–5 points = 3
- 2–3 points = 2
- 1 point = 1

10 The power plant will harm the environment in some shape or form. By increasing the amount of activity using in the power plant, the CO<sub>2</sub>, Carbon dioxide, levels will increase which could contribute to Global Climate Change.

Two ways that the power plant might affect organisms in the lake are as follows. One, the plants in the lake are adjusted to the current temperature of the lake and by warming the temperature the plants would be at risk of dying. Second, the same goes for animals or fish, but also, if plant life decreases then animals would have a decreased supply of food.

In Part A, the response explains that the plant might affect the atmosphere by increasing the carbon dioxide levels (2 pts). In Part B, there are two clear explanations of how the proposed plant might affect the lake ecosystem (4 pts). The response has no errors or omissions.

10 a. The world already has a lot of carbon dioxide from factories, cars, and other things that cause serious pollution. There are not enough trees to produce enough oxygen, and take in all of the carbon dioxide because there is so much of it. All the  $\text{CO}_2$  is creating the greenhouse effect and global warming. so adding more  $\text{CO}_2$  to the atmosphere is not going to help the least bit.

b. The reason that these organisms were living in this lake is because it is their home, and they can tolerate the temperature of the water. If they take the cold water out of the lake and replace it with hot, the lake's ~~temp~~ temperature will increase rapidly and the organisms living there will not be able to tolerate the heat, so they will all die.

In Part A, the response explains that the plant might affect the atmosphere by increasing the carbon dioxide levels (2 pts). In Part B, there is only one explanation of how the plant might affect the lake ecosystem—increasing the temperature of the lake and killing organisms (2 pts).

10

a.) One way the power plant might effect the atmosphere is some of the other gases might be from gases that aren't good for the air. Meaning it might cause a greenhouse effect.

b.) One way the plant might effect the lakes ecosystem is that the hot water coming out of the tower could be bad for the fish because the fish could die from the dramatic change in the water.

Another way is the cooling tower might have oils and gases that could be bad for the water, meaning it could kill the organisms.

In Part A, the response explains that the plant might increase the amount of harmful gases, which would "cause a greenhouse effect" (2 pts). In Part B, there is only one explanation that receives credit—increasing the temperature of the lake could kill organisms (2 pts).

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SCORE POINT 2

- 10 a. The carbon dioxide could create more green house gases. That would hurt the O-Zone layer.
- b. The hot water could change the water to much for organisms living in the lake and they might Die!

In Part A, the response describes that the plant might increase the carbon dioxide levels, but gives an incorrect explanation of how this affects the environment (1 pt). In Part B, there is only one explanation—increasing the temperature of the lake could kill organisms (2 pts).

SCORE POINT 1

- 10 Sense CO<sub>2</sub> is good for plants it might hurt the plants.
- Fish like cold water not hot water.

The response demonstrates a minimal understanding in Part B for recognizing that “fish like cold water not hot water” (1 pt).

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SCORE POINT 0

- 10
- a. I don't know.
  - b. The water will be too hot or too cold.

The response does not demonstrate understanding of how abiotic factors can change an ecosystem. (0 pts).

**NECAP 2014 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE**

<b>Broad Area of Inquiry:</b> <b>Inquiry Construct 2:</b>	<b>Formulating Questions and Hypothesizing</b> Construct coherent argument in support of a question, hypothesis, prediction.
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- ❶ Explain why drawing a food web is a useful way to help the students predict how organisms in an ecosystem might be affected by changes to a specific population.

**Scoring Guide**

<b>Score</b>	<b>Description</b>
<b>2</b>	The response demonstrates a general understanding of constructing a coherent argument in support of a question, hypothesis, or prediction. The response explains why drawing a food web is a useful way to help the students predict how organisms in an ecosystem might be affected by changes to a specific population in that ecosystem.
<b>1</b>	The response demonstrates a limited understanding of constructing a coherent argument in support of a question, hypothesis, or prediction.
<b>0</b>	The response is incorrect or irrelevant to the skill or concept being measured.
<b>Blank</b>	No response

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

Food webs show relationships between organisms, specifically which organisms eat which organisms, so if a change occurs in a particular population, one can predict which organisms or species will be affected (for example, increase or decrease in number).

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GRADE 8 SCIENCE

SCORE POINT 2

- 1 Explain why drawing a food web is a useful way to help the students predict how organisms in an ecosystem might be affected by changes to a specific population.

Drawing a food web can be useful to students when predicting how organisms in an ecosystem might be affected by changes to a specific population by seeing what animal eats or needs to survive. Some animals are very useful because they are eaten by a lot of other animals. If a very important animal starts to decrease in population so may others. You can see this in the food web by seeing what each animal eats in order to survive.

The response demonstrates a general understanding of the task. The response discusses how you can see what each animal eats, and how a decrease in a prey population could lead to a decrease in a predator population.

SCORE POINT 1

- 1 Explain why drawing a food web is a useful way to help the students predict how organisms in an ecosystem might be affected by changes to a specific population.

It is useful because the students gets to see who eats what and how many things they eat.

The response demonstrates a limited understanding of the concept by describing that a food web shows "who eats what," but the explanation does not address how populations could be affected.

NECAP 2014 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE

SCORE POINT 0

- 1 Explain why drawing a food web is a useful way to help the students predict how organisms in an ecosystem might be affected by changes to a specific population.

Drawing a food web is a useful way to help the students predict how organisms in an ecosystem, might be affected by changes to a specific population, because it makes it more easier for them to understand, and it's more organized.

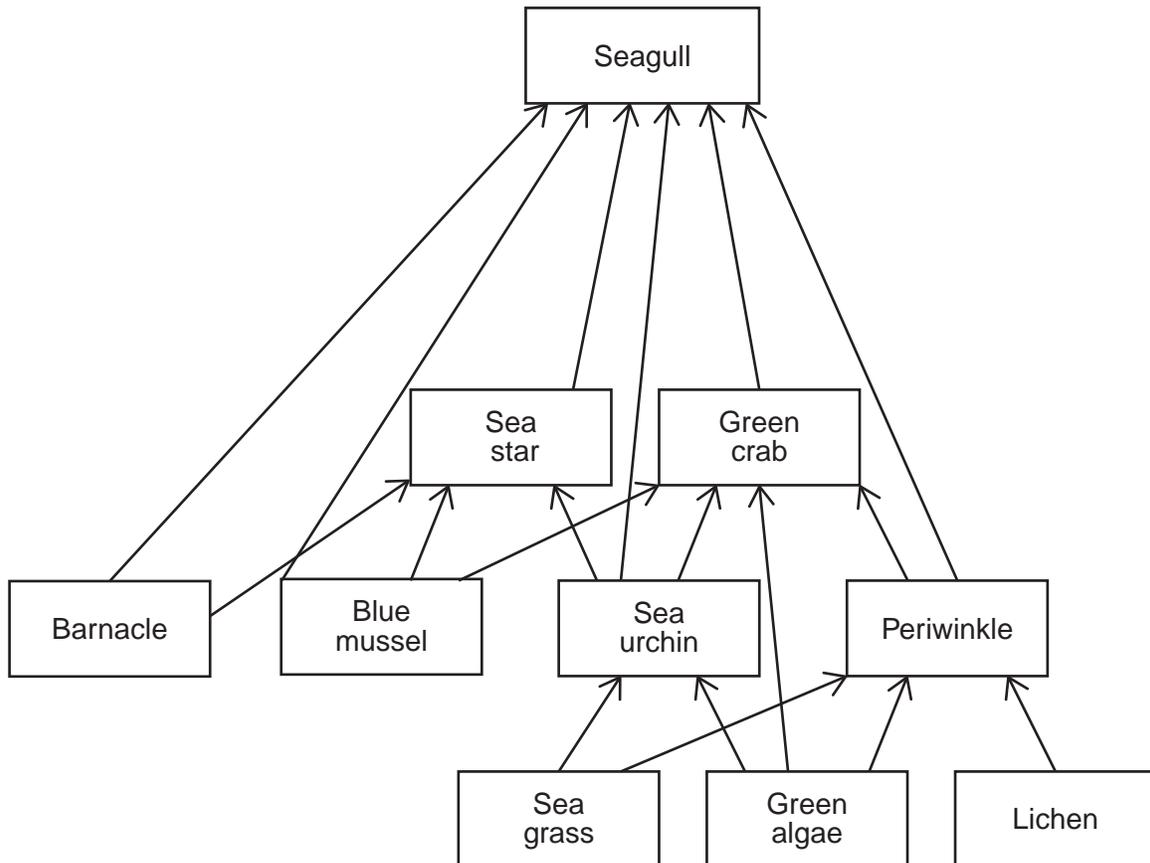
The response is incorrect or irrelevant to the skill or concept being measured.

NECAP 2014 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.

- 2 Identify whether Calvin's prediction that the seagull population would **significantly** decrease is supported by the food web in Figure 2. Use evidence from the food web to explain your answer.

Figure 2. Partial Rocky Intertidal Zone Food Web



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**Scoring Guide**

<b>Score</b>	<b>Description</b>
<b>2</b>	The response demonstrates a general understanding of analyzing data, including determining if data are relevant, artifact, irrelevant, or anomalous. The response includes an identification of whether the claim is supported by the food web and uses evidence from the food web to explain the response.
<b>1</b>	The response demonstrates a limited understanding of analyzing data, including determining if data are relevant, artifact, irrelevant, or anomalous.
<b>0</b>	The response is incorrect or irrelevant to the skill or concept being measured.
<b>Blank</b>	No response

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

No. The food web shows that seagulls also eat sea stars, sea urchins, barnacles, and periwinkles, so there would be other food for the seagulls if the green crab population decreases.

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GRADE 8 SCIENCE

SCORE POINT 2

- 2 Identify whether Calvin's prediction that the seagull population would **significantly** decrease is supported by the food web in Figure 2. Use evidence from the food web to explain your answer.

Calvin's prediction that the seagulls population would significantly decrease is unsupported by the food web. The food web shows that the seagull also gets its food from the barnacle, sea star, periwinkle, blue mussel, and the sea urchin. If the green crabs were removed, the seagull would still have many sources of food.

The response demonstrates a general understanding. The response correctly indicates that the claim isn't supported by the web, and gives other food sources as evidence to support the position.

SCORE POINT 1

- 2 Identify whether Calvin's prediction that the seagull population would **significantly** decrease is supported by the food web in Figure 2. Use evidence from the food web to explain your answer.

I think that Calvin is wrong because seagulls have many other sources of food than just green crabs.

The response demonstrates a limited understanding. The response correctly indicates that the claim isn't supported by the web, but the supporting evidence is not very detailed.

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GRADE 8 SCIENCE

SCORE POINT 0

- 2 Identify whether Calvin's prediction that the seagull population would **significantly** decrease is supported by the food web in Figure 2. Use evidence from the food web to explain your answer.

Yes it would decrease. The green crab is protein filled, and a big part of the seagull's diet. With limited crabs the sea gull's would significantly decrease.

The response does not demonstrate understanding. The response incorrectly indicates that the claim is supported by the web.

**NECAP 2014 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE**

<b>Broad Area of Inquiry:</b> <b>Inquiry Construct 12:</b>	<b>Developing and Evaluating Explanations</b> Use evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis.
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- 3 Predict how the populations of blue mussels and sea stars would **most likely** change if the population of green crabs increased. Use evidence from the food web to support your prediction.

**Scoring Guide**

<b>Score</b>	<b>Description</b>
<b>2</b>	The response demonstrates a general understanding of using evidence to support and justify interpretations and conclusions. The response includes a prediction of how the populations of blue mussels and sea stars would most likely change if the population of green crabs increased and uses evidence from Figure 2 to explain the answer.
<b>1</b>	The response demonstrates a limited understanding of using evidence to support and justify interpretations and conclusions.
<b>0</b>	The response is incorrect or irrelevant to the skill or concept being measured.
<b>Blank</b>	No response

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

The populations of blue mussels and sea stars would most likely decrease. The evidence is that green crabs eat blue mussels, and sea stars eat blue mussels. If there were more green crabs, they would eat more blue mussels. If there are fewer blue mussels, then the sea star population might have less to eat.

Note: Students might say that the sea star population would not change significantly if it ate more of the other organisms in the food web (sea urchins and barnacles).

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SCORE POINT 2

- 3 Predict how the populations of blue mussels and sea stars would **most likely** change if the population of green crabs increased. Use evidence from the food web to support your prediction.

If the green crab population increased the green crabs would eat more food because there would be more of them. The food web shows that the green crabs eat blue mussels. If there were more green crabs they would eat more blue mussels so the blue mussel population would decrease. The food web also shows that sea stars also eat blue mussels. If the blue mussel population decreased there would be less food for the sea stars so the sea star population would also decrease.

The response demonstrates a general understanding. The response includes a logical prediction of how the populations of blue mussels and sea stars would most likely decrease, and uses evidence that the crabs and the sea stars both eat the mussels.

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SCORE POINT 1

- 3 Predict how the populations of blue mussels and sea stars would **most likely** change if the population of green crabs increased. Use evidence from the food web to support your prediction.

If there were more green crabs  
the Blue mussels and Sea stars'  
populations would decrease

The response demonstrates a limited understanding of the concept by including a logical prediction of how the populations of blue mussels and sea stars would most likely decrease, but does not include evidence.

SCORE POINT 0

- 3 Predict how the populations of blue mussels and sea stars would **most likely** change if the population of green crabs increased. Use evidence from the food web to support your prediction.

I think if the Green  
Crabs were to increase  
it would be more better  
for the Sea Star and Blue  
Mussel they'll have more to  
eat.

The response is totally incorrect. No clear prediction of how the populations would be affected is given.

**NECAP 2014 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE**

<b>Broad Area of Inquiry:</b> <b>Inquiry Construct 6:</b>	<b>Planning and Critiquing of Investigations</b> Provide reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation.
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- 4 Describe **two** pieces of equipment or tools—in addition to the plastic frames—the students **most likely** used to help them collect data for the population surveys. Explain why each piece of equipment or tool was appropriate for collecting data.

**Scoring Guide**

Score	Description
2	The response demonstrates a general understanding of how to provide reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation. The response describes two pieces of equipment or tools (in addition to the plastic frames) the students most likely used to help them collect data for the population surveys and explains why these tools/equipment were appropriate for collecting data.
1	The response demonstrates a limited understanding of how to provide reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation.
0	The response is incorrect or irrelevant to the skill or concept being measured.
<b>Blank</b>	No response

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

The students used paper or a computer. The paper and computer were appropriate so that they could record their data. Reasonable materials include the following:  
shovels, buckets, nets, pencils, screens, tweezers, clipboards, magnifying glass, weights (to hold down the frames), rakes, field guide, and notebook.

Students should be given credit for these (or other materials) as long as the explanation for how the material was appropriately used is reasonable.

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SCORE POINT 2

- 4 Describe **two** pieces of equipment or tools—in addition to the plastic frames—the students **most likely** used to help them collect data for the population surveys. Explain why each piece of equipment or tool was appropriate for collecting data.

I think the students most likely used a shovel and magnifying glass to help collect data for the population surveys. In addition to the plastic frames, a shovel could be a good tool to use for picking through the rocky intertidal zone and finding blue mussels, sea stars, and green crabs. A magnifying glass can also be a good tool for studying the animals up close in order to identify them.

The response demonstrates a general understanding. The response describes two pieces of equipment or tools the students most likely used to help them collect data for the population surveys—a shovel and a magnifying glass—and includes an appropriate explanation for each.

SCORE POINT 1

- 4 Describe **two** pieces of equipment or tools—in addition to the plastic frames—the students **most likely** used to help them collect data for the population surveys. Explain why each piece of equipment or tool was appropriate for collecting data.

shovel and container

The response demonstrates a limited understanding of the task by identifying two pieces of equipment or tools, but does not explain either.

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SCORE POINT 0

- 4 Describe **two** pieces of equipment or tools—in addition to the plastic frames—the students **most likely** used to help them collect data for the population surveys. Explain why each piece of equipment or tool was appropriate for collecting data.

• Plastic frames

• rocky intertidal zone

The response does not demonstrate understanding of the task. The plastic frames were given in the prompt, and the rocky intertidal zone is not an acceptable answer.

**NECAP 2014 RELEASED INQUIRY TASK  
GRADE 8 SCIENCE**

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

- 5 Use the data from Table 2 to draw a graph that shows the populations of each species found in the three frames. Construct your graph on the grid in your Student Answer Booklet.

**Table 2. Population Survey Data from March Field Trip  
(1 m<sup>2</sup> frames)**

Frame	Number of Blue Mussels	Number of Sea Stars	Number of Green Crabs
1	36	3	2
2	62	8	4
3	33	5	2

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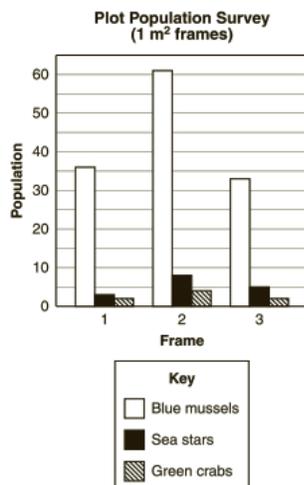
**Scoring Guide**

Score	Description
<b>3</b>	The response demonstrates a thorough understanding of how to use accepted methods for organizing, representing, and manipulating data. The response includes an accurate graph that shows the populations of each species found in the three frames.
<b>2</b>	The response demonstrates a general understanding of how to use accepted methods for organizing, representing, and manipulating data.
<b>1</b>	The response demonstrates a limited understanding of how to use accepted methods for organizing, representing, and manipulating data.
<b>0</b>	The response is incorrect or irrelevant to the skill or concept being measured.
<b>Blank</b>	No response

A thorough understanding can be exemplified by a graph that includes the following:

- Nine data points that represent the number of each species (OR 3 data points that represent the *average* number of each species—blue mussel = 43.67, sea stars = 5.33, and green crabs = 2.67) from the three plots correct to within  $\pm 1$  scale unit of error
- **Plots** label located on the x-axis (horizontal)
- **Population** or **Number of Organisms/Individuals** label located on the y-axis (vertical)
- Appropriate title from data table
- Range from zero to minimum of 62 on y-axis (vertical) with clearly marked subdivisions (single cm, multiples of cm) so that bar height values can be easily determined
- Either clear labels or a key distinguishing species counts in each plot

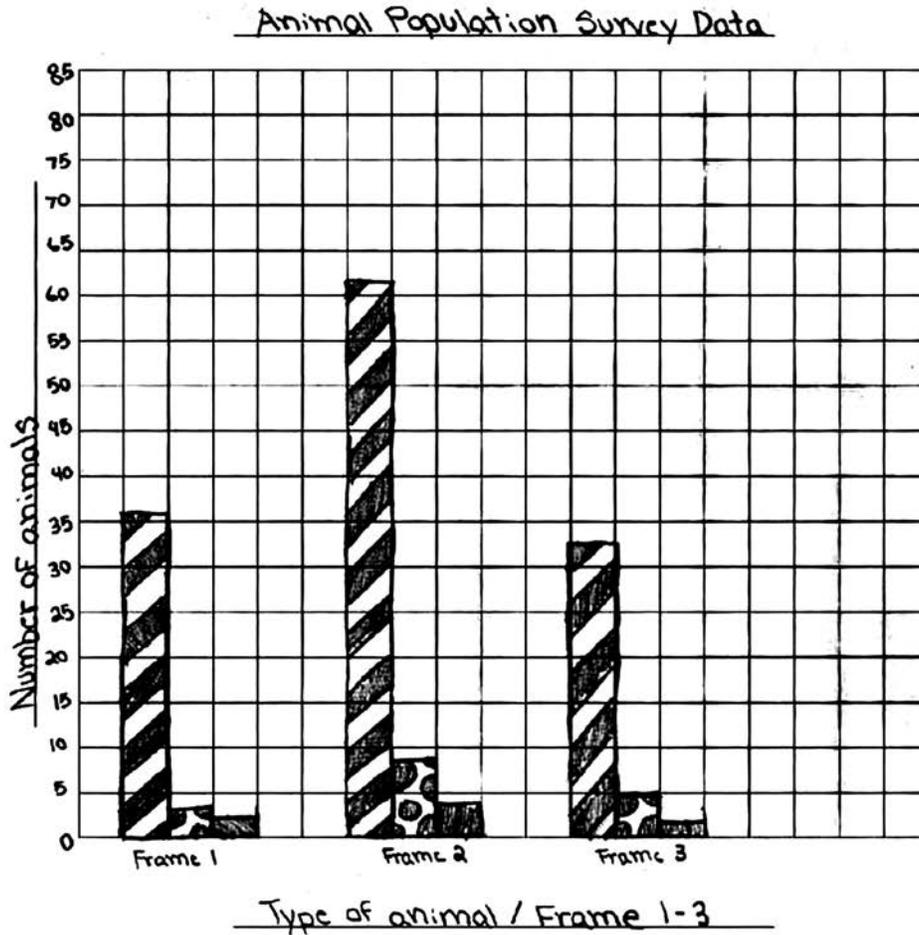
Sample graph:



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SCORE POINT 3

- 5 Use the data from Table 2 to draw a graph that shows the populations of each species found in the three frames. Construct your graph on the grid in your Student Answer Booklet.



 = Blue mussel

 = Green crab

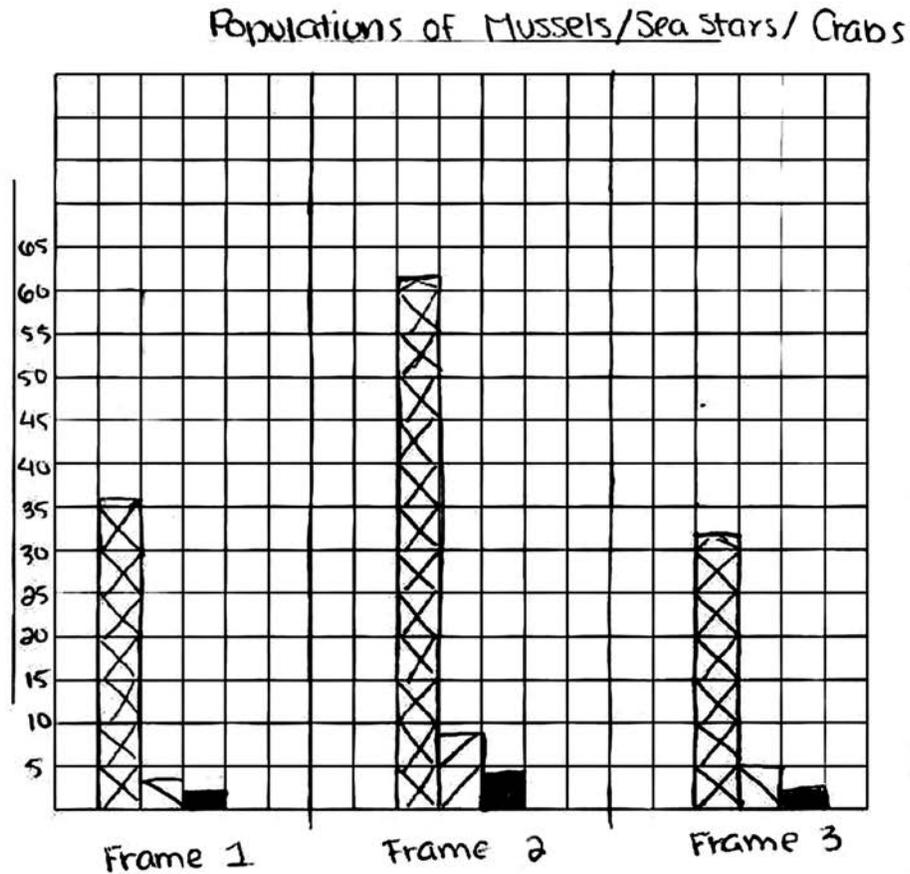
 = Sea star

The response includes an accurate graph that shows how many of each species are found in the three frames. All data points are correct, labels and titles are appropriate, the range and scale are appropriate, and there is an appropriate key.

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SCORE POINT 2

- 5 Use the data from Table 2 to draw a graph that shows the populations of each species found in the three frames. Construct your graph on the grid in your Student Answer Booklet.

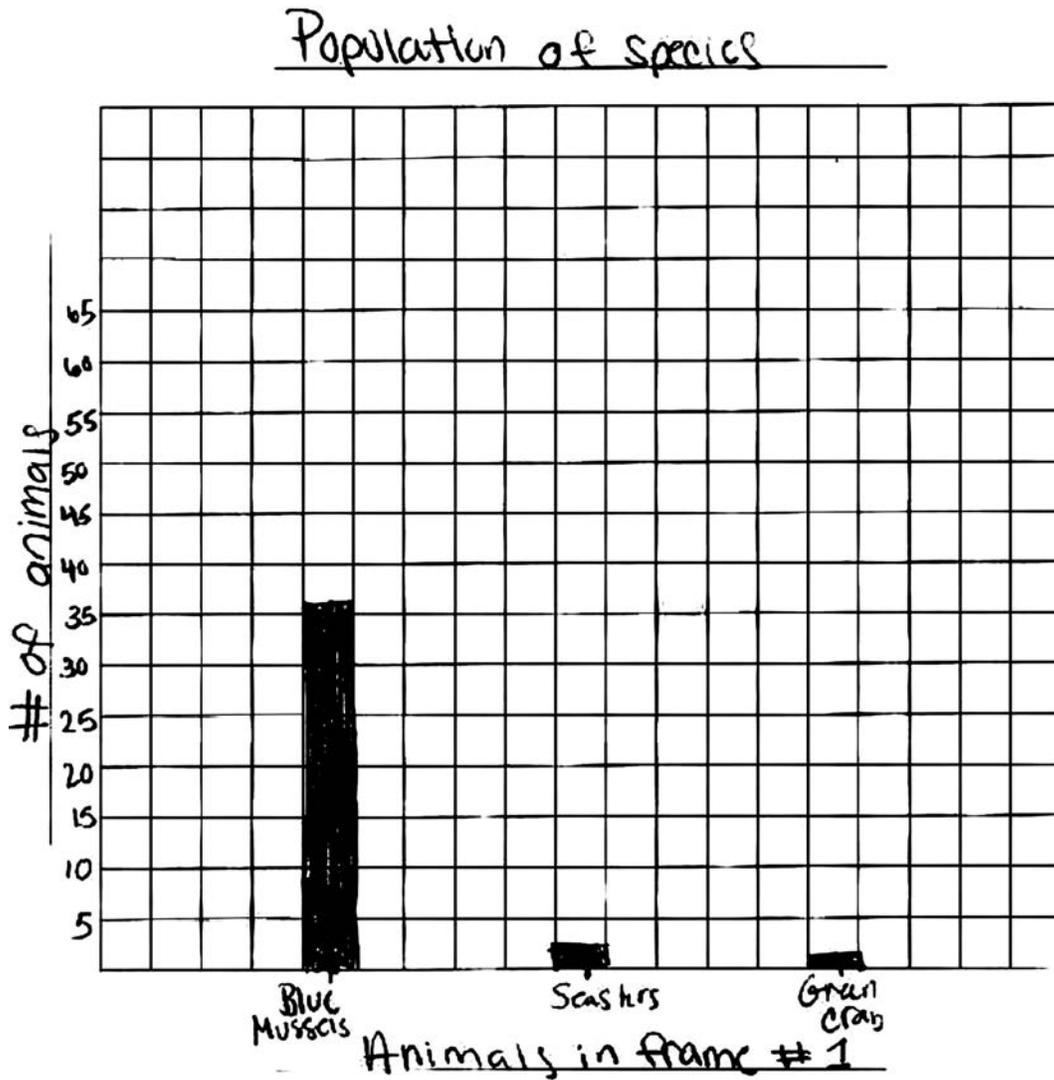


The response demonstrates a general understanding. All data points are correct, there is an appropriate title, the range and scale are mostly appropriate except for 0, and there is an appropriate key to distinguish the species, but the axes labels are omitted.

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SCORE POINT 1

- 5 Use the data from Table 2 to draw a graph that shows the populations of each species found in the three frames. Construct your graph on the grid in your Student Answer Booklet.

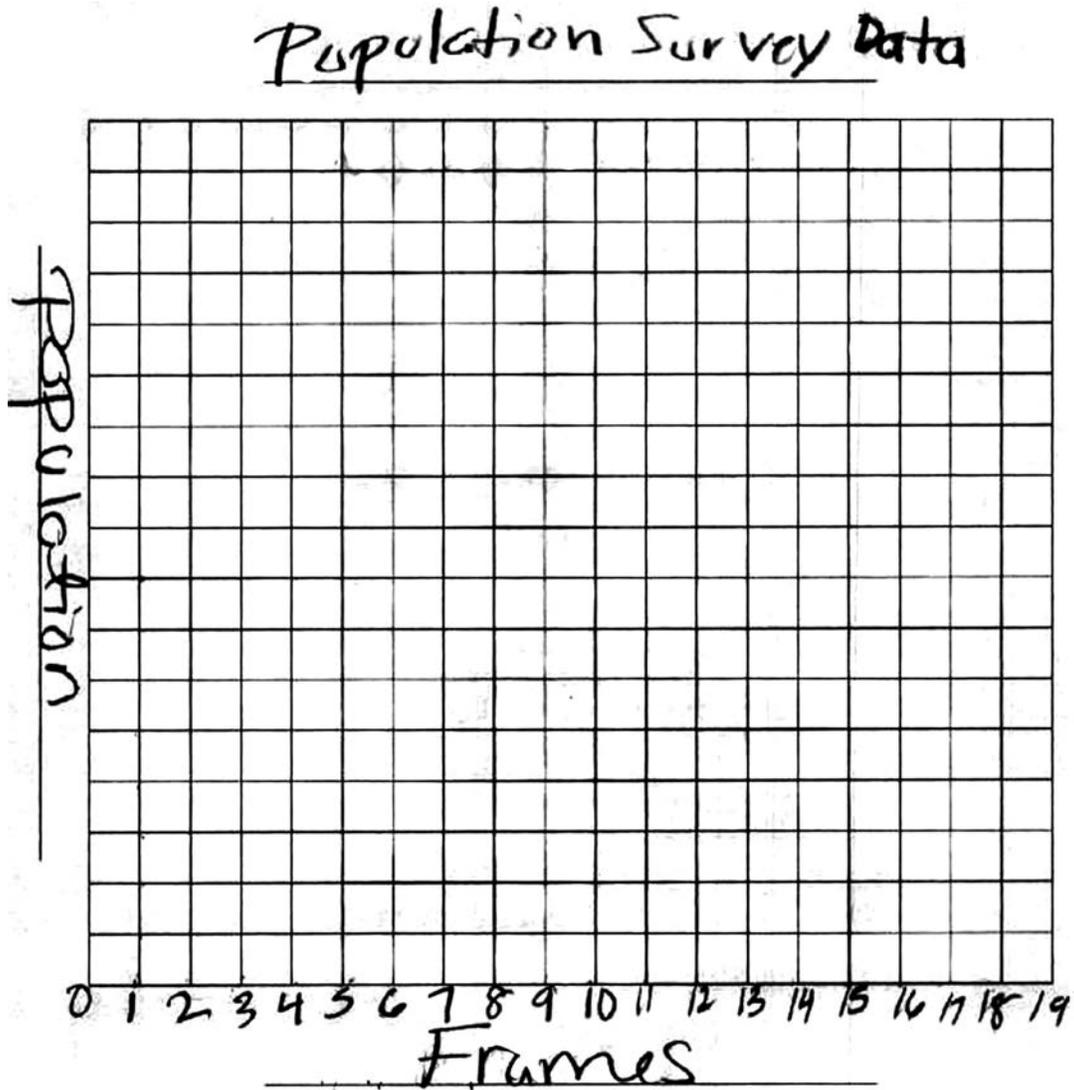


The response demonstrates a limited understanding. Only Frame 1 has been correctly charted and there is no key to distinguish the species, but there is an appropriate title and the range and scale are mostly appropriate except for the omission of 0.

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SCORE POINT 0

- 5 Use the data from Table 2 to draw a graph that shows the populations of each species found in the three frames. Construct your graph on the grid in your Student Answer Booklet.



The response does not demonstrate understanding. Even though there are generic labels and a title, since none of the data points have been graphed, there is not enough evidence of graphing skills.

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<b>Broad Area of Inquiry:</b> <b>Inquiry Construct 4:</b>	<b>Planning and Critiquing of Investigations</b> Identify information/evidence that needs to be collected in order to answer the question, hypothesis, prediction.
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- 6 Read the prediction you made in response to question 3. Use Table 2 and information from the story to explain whether the students collected enough data on their field trip for you to determine if your prediction about the change in population in response to question 3 is supported. Explain your answer.

**Scoring Guide**

<b>Score</b>	<b>Description</b>
<b>3</b>	The response demonstrates a thorough understanding of identifying information/evidence that needs to be collected in order to answer the question, hypothesis, or prediction. The response identifies whether the students collected enough data to determine if the test taker's prediction is supported and explains the answer.
<b>2</b>	The response demonstrates a general understanding of identifying information/evidence that needs to be collected in order to answer the question, hypothesis, or prediction.
<b>1</b>	The response demonstrates a limited understanding of identifying information/evidence that needs to be collected in order to answer the question, hypothesis, or prediction.
<b>0</b>	The response is incorrect or irrelevant to the skill or concept being measured.
<b>Blank</b>	No response

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

The students have not collected enough data because they only have information from one period in time or from a small area and they need data to help them determine whether the populations of blue mussels and sea stars decreased over time [relative to an increase in the green crab population].

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SCORE POINT 3

- 6 Read the prediction you made in response to question 3. Use Table 2 and information from the story to explain whether the students collected enough data on their field trip for you to determine if your prediction about the change in population in response to question 3 is supported. Explain your answer.

The students didn't collect enough data for me to decide whether or not my prediction is accurate. In order for me to be able to decide, I would need to see a few other surveys done, for population at different times. That way we could see an increase or decrease in each species population and see if it follows the food web.

- 3 If the population of green crabs increased, the sea star population most likely would too. This is because the sea gulls would be eating more green crabs than sea stars, giving the sea stars a chance to grow in population. However, the blue mussel population would decrease a lot because there are more sea stars and mussels that need food.

The response demonstrates a thorough understanding. The response correctly identifies that there is not enough information to support the prediction, because information would need to be gathered at multiple points in time in order to accurately test the prediction.

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SCORE POINT 2

- 6 Read the prediction you made in response to question 3. Use Table 2 and information from the story to explain whether the students collected enough data on their field trip for you to determine if your prediction about the change in population in response to question 3 is supported. Explain your answer.

There is not enough data provided to determine if my prediction is correct, because that would require having data that was collected over a certain amount of time.

- 3 The population of blue mussels and sea urchins would decrease, because green crabs eat both blue mussels and sea urchins.

The response correctly identifies that there is not enough information to support the prediction, because information would need to be gathered over a certain amount of time, but the explanation does not include detail as to how this information would be used.

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SCORE POINT 1

- 6 Read the prediction you made in response to question 3. Use Table 2 and information from the story to explain whether the students collected enough data on their field trip for you to determine if your prediction about the change in population in response to question 3 is supported. Explain your answer.

The Students didn't take enough data to prove or disprove my claim, with only 3 sets of data, we could not be getting the whole picture.

- 3 The population

If the number of green crabs increased, the number of blue mussels and sea stars would decrease. This is because there would be more green crabs eating the mussels which would leave the sea stars with less food.

The response demonstrates a limited understanding. The response correctly identifies that there is not enough information to support the prediction, but "we could not be getting the whole picture" is a vague explanation.

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SCORE POINT 0

- 6 Read the prediction you made in response to question 3. Use Table 2 and information from the story to explain whether the students collected enough data on their field trip for you to determine if your prediction about the change in population in response to question 3 is supported. Explain your answer.

yes I think MY Prediction  
is Supported about the  
Change in population.

- 3 I think if the Green  
Crabs were to increase  
it would be more better  
for the Sea Star and Blue  
Mussel they'll have more to  
eat.

The response is irrelevant to the concept being measured.

**NECAP 2014 RELEASED INQUIRY TASK  
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<b>Broad Area of Inquiry:</b> <b>Inquiry Construct 2:</b>	<b>Formulating Questions and Hypothesizing</b> Construct coherent argument in support of a question, hypothesis, prediction.
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- 7 Describe how data from an ongoing population survey (repeated visits to Coastal Park) could be used to help test your prediction.

**Scoring Guide**

<b>Score</b>	<b>Description</b>
<b>2</b>	The response demonstrates a general understanding of constructing a coherent argument in support of a question, hypothesis, or prediction. The response describes how data from an ongoing population survey could be used to help test the prediction from question 3.
<b>1</b>	The response demonstrates a limited understanding of constructing a coherent argument in support of a question, hypothesis, or prediction.
<b>0</b>	The response is incorrect or irrelevant to the skill or concept being measured.
<b>Blank</b>	No response

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

Population survey data can provide evidence of how the populations of blue mussels, sea stars, and green crabs *change over time*.

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SCORE POINT 2

- 7 Describe how data from an ongoing population survey (repeated visits to Coastal Park) could be used to help test your prediction.

The data from an ongoing population survey could be used to help test my prediction because then I would be able to see the changes that had happen over time.

The response demonstrates a general understanding by describing how data from an ongoing population survey could be used to help provide evidence of how the populations change over time.

SCORE POINT 1

- 7 Describe how data from an ongoing population survey (repeated visits to Coastal Park) could be used to help test your prediction.

So I can see if any species is increasing or decreasing.

The response demonstrates a limited understanding by describing how data from an ongoing population survey could be used to help provide evidence of how the populations change, but doesn't describe how it is an ongoing process over time.

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SCORE POINT 0

- 7 Describe how data from an ongoing population survey (repeated visits to Coastal Park) could be used to help test your prediction.

Data from an ongoing population survey could be used to help test my prediction because it would prove whether I was right or not.

The response does not demonstrate understanding of the concept.

**NECAP 2014 RELEASED INQUIRY TASK  
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<b>Broad Area of Inquiry:</b> <b>Inquiry Construct 5:</b>	<b>Planning and Critiquing of Investigations</b> Develop an organized and logical approach to investigating the question, including controlling variables.
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- 8 Describe how the students can make sure that the information they collect from future population surveys will provide the information they need to help them test their predictions. Explain your answer. (Hint: Think about good experimental techniques.)

**Scoring Guide**

<b>Score</b>	<b>Description</b>
<b>2</b>	The response demonstrates a general understanding of developing an organized and logical approach to investigating the question, including controlling variables. The response describes how the students can make sure that the information they collect from future population surveys will provide the information they need to help them test their predictions and explains the answer.
<b>1</b>	The response demonstrates a limited understanding of developing an organized and logical approach to investigating the question, including controlling variables.
<b>0</b>	The response is incorrect or irrelevant to the skill or concept being measured.
<b>Blank</b>	No response

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

The students can make sure that they are collecting information from the same tidal zone in the same plots. This would give the students evidence of how the populations of the organisms change over a longer period [so that the students could feel their conclusions were better supported].

Note: Other acceptable ways to obtain reliable information include the following: collecting data during the same time of year, collecting data during the same tidal time or taking multiple surveys.

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SCORE POINT 2

- 8 Describe how the students can make sure that the information they collect from future population surveys will provide the information they need to help them test their predictions. Explain your answer. (Hint: Think about good experimental techniques.)

The students can do some specific things to make sure they get accurate data every time. The first thing and the biggest thing is to do exactly the same thing every time. Even the smallest detail could alter the outcome of the data. Another thing is to take the data from the same section of the park to get the right data. There could be totally different population numbers at the other end of Coastal Park and that would certainly change the outcome of the survey.

The response demonstrates a general understanding. The response describes how the students can make sure that they use the same exact procedures and the same location each time, and how these could affect the data if not properly controlled.

SCORE POINT 1

- 8 Describe how the students can make sure that the information they collect from future population surveys will provide the information they need to help them test their predictions. Explain your answer. (Hint: Think about good experimental techniques.)

they would need to repeat the same steps they did last time like when they do it where they place the frames.

The response demonstrates a limited understanding. The response describes how the students should make sure that they use the same location and the same time, but the explanation is less detailed and doesn't describe how changing these could affect the data.

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SCORE POINT 0

- 8 Describe how the students can make sure that the information they collect from future population surveys will provide the information they need to help them test their predictions. Explain your answer. (Hint: Think about good experimental techniques.)

The students could have checked over the information more than once also they couldve checked it over with another person.

The response does not demonstrate understanding of the concept.