Science Grade 7 Practice Test Answer Key

This document contains the answer keys, rubrics, and Scoring Notes for items on the Science Grade 7 Practice Test. Additional Practice Test resources are available in the LDOE Practice Test Library.

Session	Set	Sequence	Item Type	Key	Point Value	Alignment
1	Melting Icebergs	1	TEI	See Rubric	2	PE: 7-MS-PS1-4 SEP: 2. Developing and using models DCI: MS.PS1A.d CCC: Scale, Proportion and Quantity
1		2	MC	A	1	PE: 7-MS-PS1-4 SEP: 2. Developing and using models DCI: MS.PS1A.f CCC: Cause and Effect
1		3	TEI	See Rubric	2	PE: 7-MS-PS3-4 SEP: 3. Planning and carrying out investigations DCI: MS.PS3A.d
1		4	MC	D	1	PE: 7-MS-PS3-4 SEP: 3. Planning and carrying out investigations DCI: MS.PS3A.d CCC: Scale, Proportion and Quantity
1	Spider Plants	5	TEI	See Rubric	1	PE: 7-MS-LS3-2 SEP: 2. Developing and using models DCI: MS.LS1B.a
1		6	MC	C	1	PE: 7-MS-LS4-4 DCI: MS.LS4B.a CCC: Cause and Effect
1		7	TPD: MC/ MC	D, B	2	PE: 7-MS-LS4-4 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: MS.LS4B.a CCC: Cause and Effect
1		8	CR	See Rubric	2	PE: 7-MS-LS3-2 SEP: 2. Developing and using models DCI: MS.LS1B.a CCC: Cause and Effect
1	Volcanic Carbon	9	MC	D	1	PE: 7-MS-ESS3-5 SEP: 1. Asking questions (for science) and defining problems (for engineering) DCI: MS.ESS3D.a CCC: Stability and Change
1		10	TPD: TEI/ MC	See Rubric	2	PE: 7-MS-PS1-5 SEP: 2. Developing and using models DCI: MS.PS1B.b CCC: Energy and Matter

Session	Set	Sequence	Item Type	Key	Point Value	Alignment
1	Volcanic Carbon	11	MS	B, E	1	PE: 7-MS-ESS3-5 DCI: MS.ESS3D.a CCC: Stability and Change
1		12	CR	See Rubric	2	PE: 7-MS-PS1-5 DCI: MS.PS1B.a, MS.PS1B.b CCC: Energy and Matter
1	Standalone Items	13	MC	D	1	PE: 7-MS-LS2-5 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: MS.LS2C.b CCC: Stability and Change
1		14	TEI	See Rubric	2	PE: 7-MS-PS1-2 SEP: 4. Analyzing and interpreting data DCI: MS.PS1B.a CCC: Patterns
1		15	TEI	See Rubric	2	PE: 7-MS-LS1-3 SEP: 7. Engaging in argument from evidence DCI: MS.LS1A.c CCC: Systems and System Models
2	Zebra Mussels	16	TPD: TEI/ MC	See Rubric	2	PE: 7-MS-LS2-5 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: MS.ETS1B.a CCC: Stability and Change
2		17	MC	D	1	PE: 7-MS-LS2-4 SEP: 7. Engaging in argument from evidence DCI: MS.LS2C.a CCC: Stability and Change
2		18	TEI	See Rubric	1	PE: 7-MS-LS2-5 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: MS.ETS1B.a CCC: Stability and Change
2		19	TPD: MC/ MC	C, B	2	PE: 7-MS-LS2-4 SEP: 7. Engaging in argument from evidence DCI: MS.LS2C.a CCC: Stability and Change
2		20	ER	See Rubric	9	PE: 7-MS-LS2-5 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: MS.ETS1B.a CCC: Stability and Change

Session	Set	Sequence	Item Type	Key	Point Value	Alignment
2	Standalone Items	21	MS	C, D, G	1	PE: 7-MS-ESS2-4 SEP: 2. Developing and using models DCI: MS.ESS2C.a CCC: Energy and Matter
2		22	TEI	See Rubric	2	PE: 7-MS-PS1-4 SEP: 2. Developing and using models DCI: MS.PS1A.f CCC: Cause and Effect
2		23	TEI	See Rubric	2	PE: 7-MS-ESS2-6 SEP: 2. Developing and using models DCI: MS.ESS2D.a CCC: Systems and System Models
3	Louisiana Swamplands	24	TEI	See Rubric	1	PE: 7-MS-LS1-7 SEP: 2. Developing and using models DCI: MS.LS1C.b CCC: Energy and Matter
3		25	TEI	See Rubric	1	PE: 7-MS-LS1-6 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: MS.LS1C.a
3		26	TPD: TEI/ MC	See Rubric	2	PE: 7-MS-LS1-7 SEP: 2. Developing and using models DCI: MS.LS1C.b
3		27	CR	See Rubric	2	PE: 7-MS-LS1-6 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: MS.PS3D.a CCC: Energy and Matter
3	The Arizona Monsoon	28	MC	D	1	PE: 7-MS-ESS2-6 SEP: 2. Developing and using models DCI: MS.ESS2D.a CCC: Cause and Effect
3		29	MS	A, C, D	1	PE: 7-MS-ESS2-5 SEP: 3. Planning and carrying out investigations DCI: MS.ESS2D.a CCC: Cause and Effect
3		30	TPD: MC/ MC	A, C	2	PE: 7-MS-ESS2-6 SEP: 2. Developing and using models DCI: MS.ESS2D.a CCC: Cause and Effect
3		31	CR	See Rubric	2	PE: 7-MS-ESS2-5 SEP: 3. Planning and carrying out investigations DCI: MS.ESS2D.a CCC: Cause and Effect

Session	Set	Sequence	Item Type	Key	Point Value	Alignment
3	Standalone Items	32	MC	A	1	PE: 7-MS-LS1-6 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: MS.LS1C.a CCC: Energy and Matter
3		33	MC	C	1	PE: 7-MS-LS1-7 SEP: 2. Developing and using models DCI: MS.LS1C.b CCC: Energy and Matter
3		34	MC	B	1	PE: 7-MS-PS1-2 SEP: 4. Analyzing and interpreting data DCI: MS.PS1B.a
3		35	TPD: MC/ MC	B, D	2	PE: 7-MS-LS4-4 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: MS.LS4B.a CCC: Cause and Effect
3		36	MS	A, D, F	1	PE: 7-MS-ESS3-5 SEP: 1. Asking questions (for science) and defining problems (for engineering) DCI: MS.ESS3D.a CCC: Stability and Change
3		37	MC	B	1	PE: 7-MS-PS1-2 DCI: MS.PS1B.a CCC: Patterns
3		38	MC	B	1	PE: 7-MS-LS2-4 SEP: 7. Engaging in argument from evidence DCI: MS.LS2C.a CCC: Stability and Change
3		39	TPD: MC/ TEI	See Rubric	2	PE: 7-MS-LS4-5 SEP: 8. Obtaining, evaluating, and communicating information DCI: MS.LS4B.b CCC: Cause and Effect
3		40	TEI	See Rubric	1	PE: 7-MS-PS3-4 SEP: 3. Planning and carrying out investigations DCI: MS.PS3A.d
3		41	MC	C	1	PE: 7-MS-LS1-3 SEP: 7. Engaging in argument from evidence DCI: MS.LS1A.c CCC: Systems and System Models

Item Types and Scoring:

- Multiple-choice (MC) questions with four answer options and only one correct answer: all MC items are worth one point each.

  Multiple-select (MS) questions with five to seven answer options and more than one correct answer: for MS items, the question identifies the number of correct answers, unless it is part of a Two-part Dependent (TPD). In a TPD, the question in Part B will then be worded to "select all that apply." All MS items are worth one point each.

- Technology Enhanced Items (TEI): uses technology to capture student comprehension in authentic ways. TE items are worth up to two points and may include item types such as, but not limited to, drag and drop, dropdown menus, and hot spots.

- Two-part Items: require students to answer two related questions, worth a total of two points. Two-part items may combine MC, MS, and/or TE item types.
  - Two-part Dependent (TPD): the first part must be correct in order to earn credit for the second part. TPDs are scored as follows:
    - If both parts are correct, score is 2.
    - If Part A is correct and Part B is incorrect or partially correct, score is 1.
    - If Part A is incorrect, score is 0 regardless of Part B.
  - Two-part Independent (TPI): each part is scored independently, with each part worth one point.

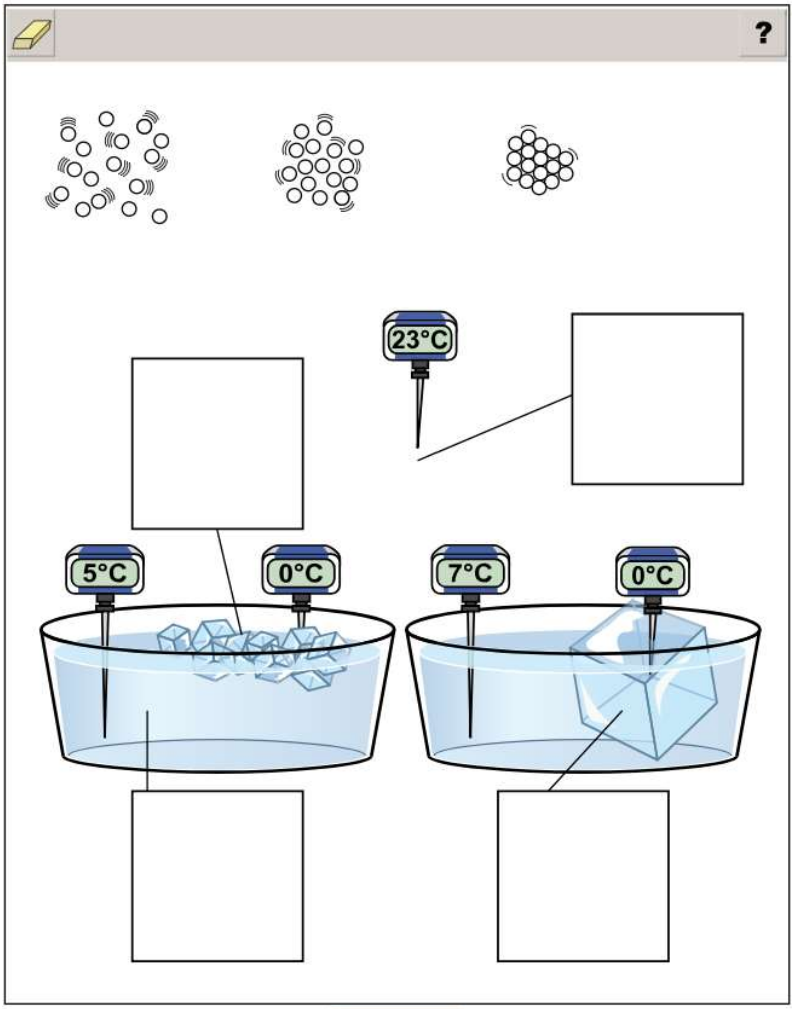
- Constructed Response (CR): requires a brief response provided by the student and will be scored using a 2-point rubric. These items may require a brief paragraph, a few sentences, and/or completion of a chart.

- Extended Response (ER): asks students to write an in-depth response that expresses the students' ability to apply all three dimensions of the LSS for Science and will be scored using a 9-point rubric.

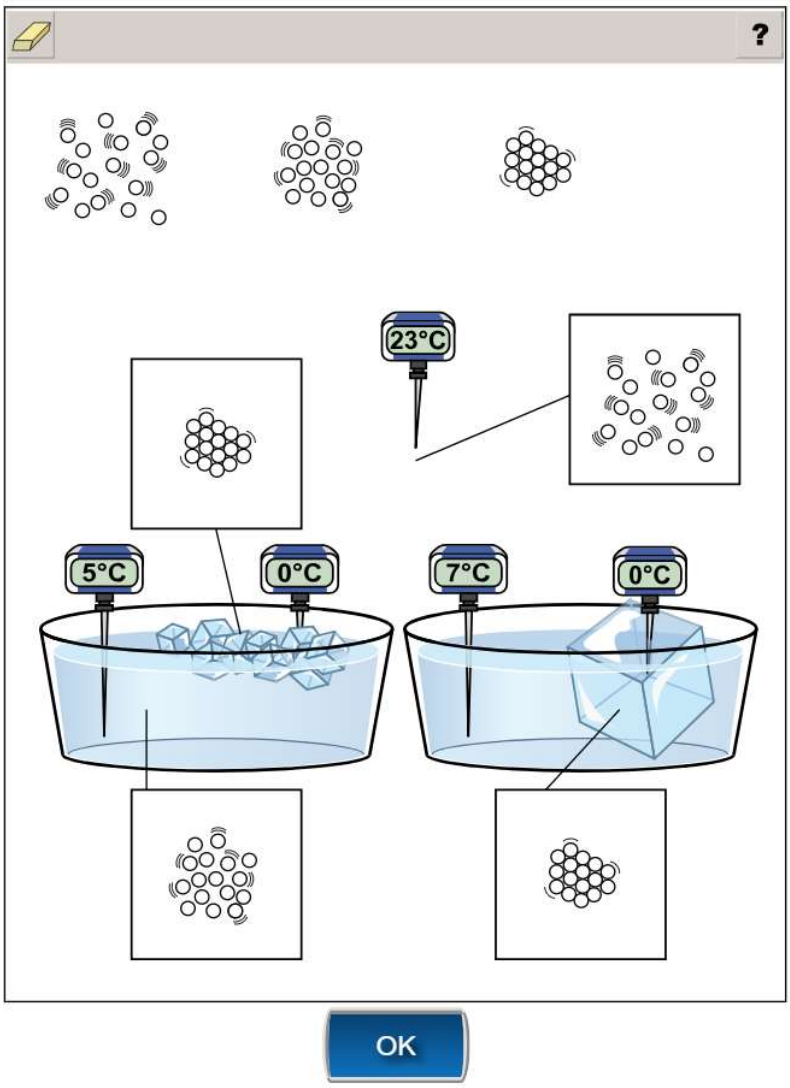
Session 1 Item 1 (TEI)

Drag the particles into the boxes to show how temperature affects the motion of particles in the ice bath experiment model.

Particles may be used more than once.



Session 1 Item 1 (TEI) - Rubric



Scoring Notes:

This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 4 correct responses; therefore 1 point will be awarded if the student selects 2 or more correct responses.

Session 1 Item 3 (TEI) - Rubric

Select the correct answer from **each** drop-down menu to complete the paragraph about experimental variables in the ice bath experiment.

During the ice bath experiment, the [surface area of the ice ▾] was the independent variable and the [time for the ice to melt ▾] was the dependent variable. The [mass of the ice ▾] was held constant for both experiments.

Scoring Notes:

This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 3 correct responses; therefore 1 point will be awarded if the student selects 2 correct responses.

Session 1 Item 5 (TEI)

Drag the descriptions into the correct boxes to complete the model describing the types of spider plant reproduction.

Not all descriptions will be used.

?

Offspring receive genes from two parents and can have different traits than the parents.

Offspring receive genes from two parents and are identical to the parents.

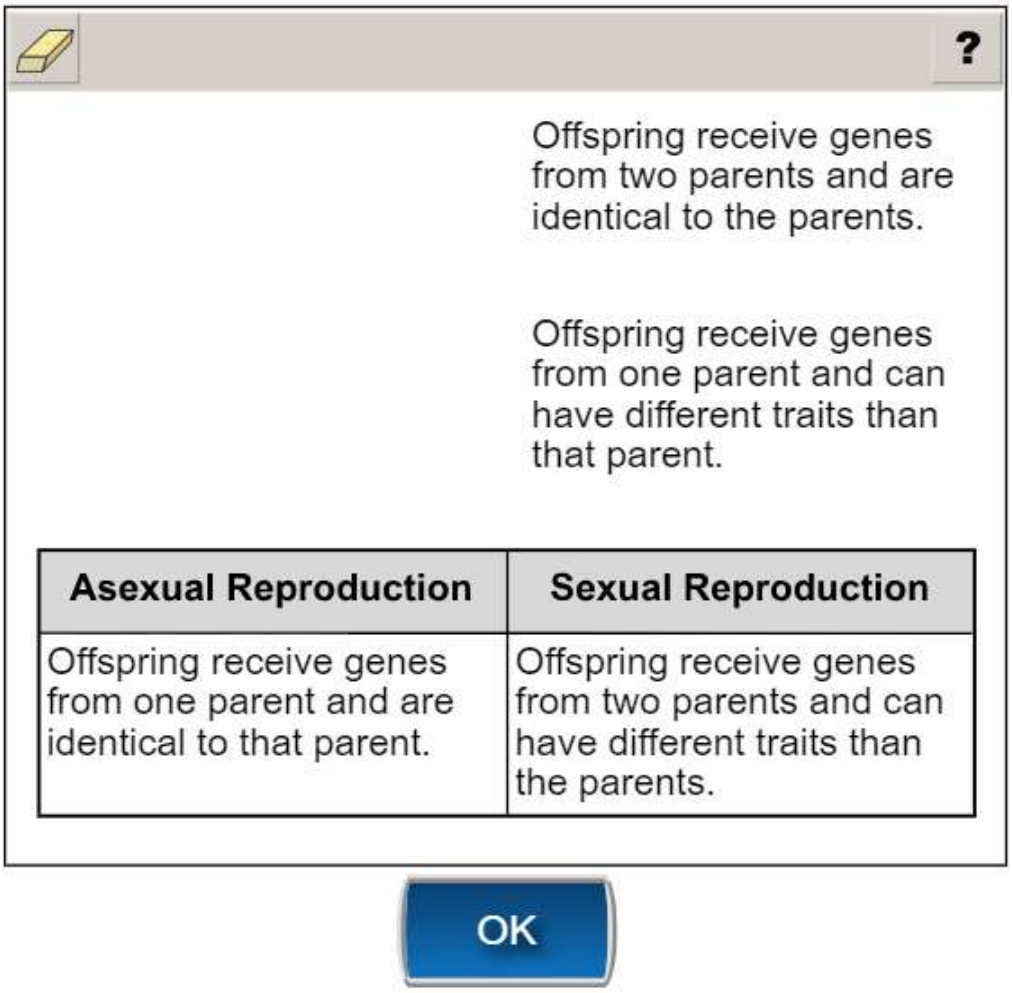
Offspring receive genes from one parent and are identical to that parent.

Offspring receive genes from one parent and can have different traits than that parent.

Asexual Reproduction	Sexual Reproduction

OK

Session 1 Item 5 (TEI) - Rubric



Session 1 Item 8 (CR)

The botanist from the nursery is planning to develop a large number of new spider plants with larger flowers.

Identify the type of reproduction the botanist should use to develop the new spider plants and explain why this type of reproduction is preferable.

Scoring Information	
Score	**Description**
2	Student's response correctly identifies the type of reproduction the botanist should use and explains why this type of reproduction is preferable.
1	Student's response correctly identifies the type of reproduction the botanist should use BUT DOES NOT explain why this type of reproduction is preferable.
0	Student's response does **not** correctly identify the type of reproduction or explain why this type of reproduction is preferable. **OR** Student's response is blank, irrelevant, or too brief to evaluate.

Scoring Notes:

- Identifies sexual reproduction as the type of reproduction the botanist should use (1 point)
- Explains why sexual reproduction is preferable (1 point)

Examples include:

- The botanist should use sexual reproduction to produce the new spider plants because sexual production results in offspring with different traits, like larger flowers.
- The botanist should use sexual reproduction to make the new plants because asexual reproduction will only produce spider plant offspring with the same types of traits as the parents.

Accept other reasonable answers.

Session 1 Item 10 (TPD)

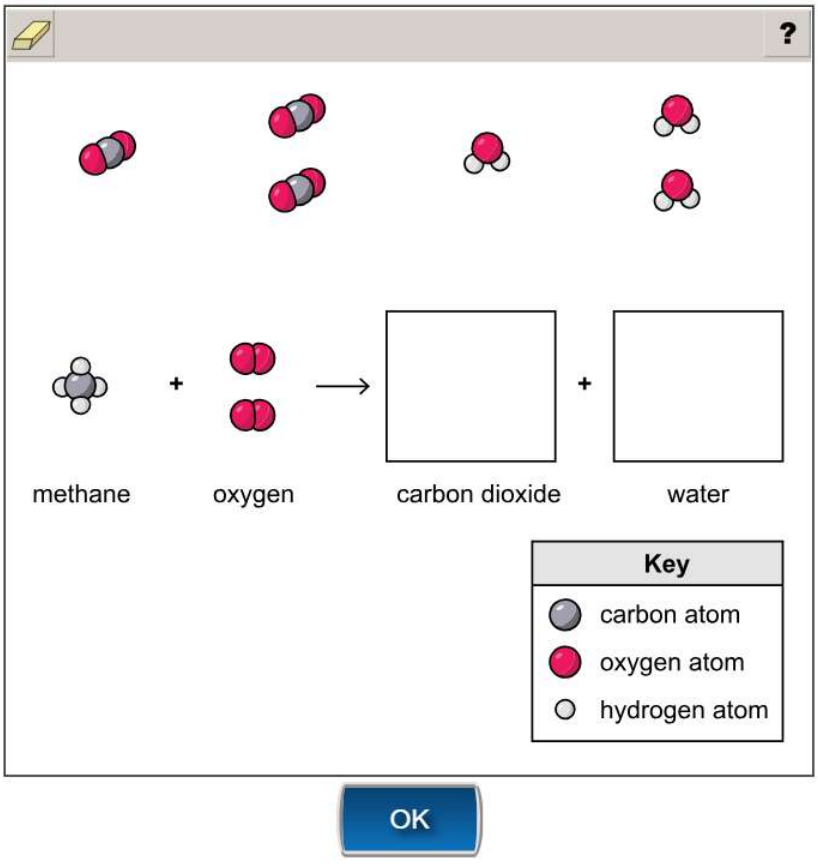
One way that human activities can add carbon to the atmosphere is through the burning of fossil fuels that contain methane (CH_4). This process returns carbon to the atmosphere in the form of carbon dioxide (CO_2).

Part A

When fossil fuels that contain CH_4 are heated, a reaction occurs. The CH_4 molecules react with oxygen (O_2) molecules in the air to form CO_2 molecules and water (H_2O) molecules.

Drag the correct number of **each** molecule into the boxes to show how many molecules of CO_2 and H_2O are formed during this reaction.

Not all molecules will be used.



Session 1 Item 10 (TPD), continued

Part B

Which statement about how atoms and molecules move through the slow carbon cycle is **best** supported by the answer to Part A?

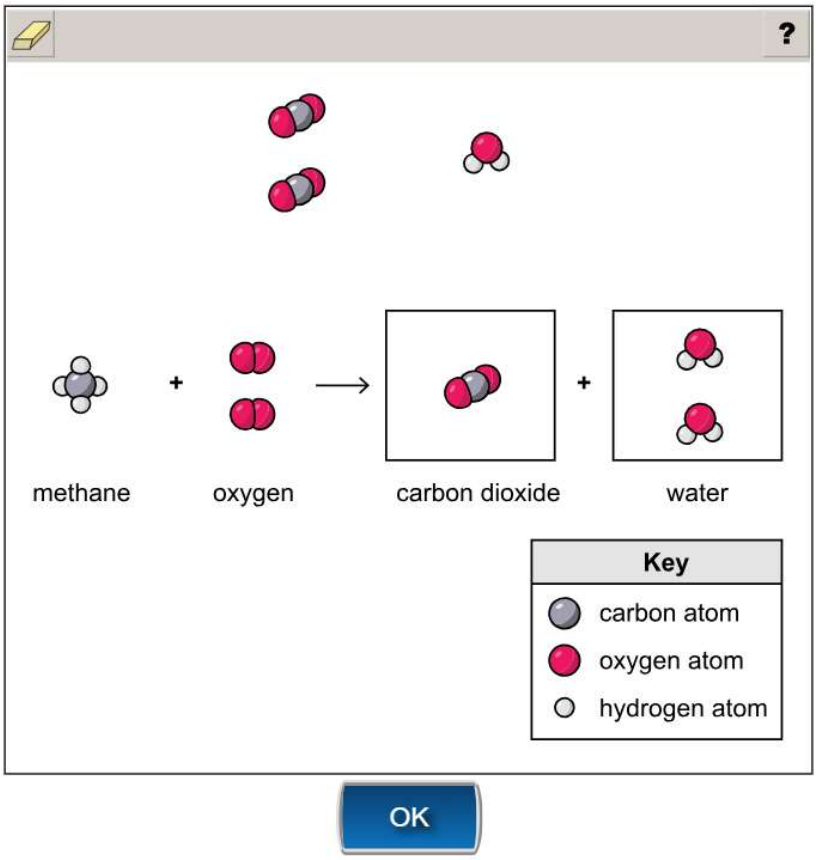
(a) The total number of atoms for each element does not change even after a reaction occurs in the slow carbon cycle.

(b) The total mass of each element always changes after a reaction occurs in the slow carbon cycle.

(c) The total number of molecules formed always changes after a reaction occurs in the slow carbon cycle.

(d) The total mass of each element decreases each time a reaction occurs in the slow carbon cycle.

Session 1 Item 10 (TPD) - Rubric



Part B

Which statement about how atoms and molecules move through the slow carbon cycle is **best** supported by the answer to Part A?

(a) The total number of atoms for each element does not change even after a reaction occurs in the slow carbon cycle.

(b) The total mass of each element always changes after a reaction occurs in the slow carbon cycle.

(c) The total number of molecules formed always changes after a reaction occurs in the slow carbon cycle.

(d) The total mass of each element decreases each time a reaction occurs in the slow carbon cycle.

Session 1 Item 12 (CR)

The data in Graph 2 show a steady increase in the concentration of atmospheric CO_2 over a 50-year period.

Describe whether the increase in atmospheric CO_2 affects the total mass of carbon on Earth. Explain **one** reason for your answer.

Scoring Information	
Score	**Description**
2	Student's response correctly describes whether the increase in atmospheric CO_2 affects the total mass of carbon on Earth and correctly explains one reason for the answer.
1	Student's response correctly describes whether the increase in atmospheric CO_2 affects the total mass of carbon on Earth, but does **not** correctly explain one reason for the answer.
0	Student's response does **not** correctly describe whether the increase in atmospheric CO_2 affects the total mass of carbon on Earth or correctly explain one reason for the answer. **OR** Student's response is blank, irrelevant, or too brief to evaluate.

Scoring Notes:

- Description of whether the increase in atmospheric CO_2 affects the total mass of carbon on Earth (1 point)
- Explanation of a reason for the answer (1 point)

Examples include:

- The total mass of carbon on Earth does not change when atmospheric CO_2 increases, because the carbon moves from one place to another, like from magma to the atmosphere, when a volcano erupts.
- The total mass of carbon on Earth does not change when atmospheric CO_2 increases. Carbon is moved from the ground into the atmosphere through burning fossil fuels.

Accept other reasonable answers.

Session 1 Item 14 (TEI) - Rubric

Use the information and your knowledge of science to answer the question.

Zinc sulfide can be made by heating a mixture of zinc and sulfur. The properties of each substance in this process are shown in the table.

Substance	Physical State	Melting Point (°C)	Solubility (in water, pH = 7)	Color
zinc	solid	419.5	insoluble	silver
sulfur	solid	115.2	insoluble	yellow
zinc sulfide	solid	1,830.0	insoluble	white

Source: American Elements.

Based on the information in the table, select the correct answer from **each** drop-down menu to complete the paragraph.

When a mixture of zinc and sulfur is heated, a chemical reaction [occurs] . This is supported by the data in the table showing that [zinc sulfide is a different color] . During this process, the zinc and sulfur atoms [rearrange to form new molecules] .

Scoring Notes:

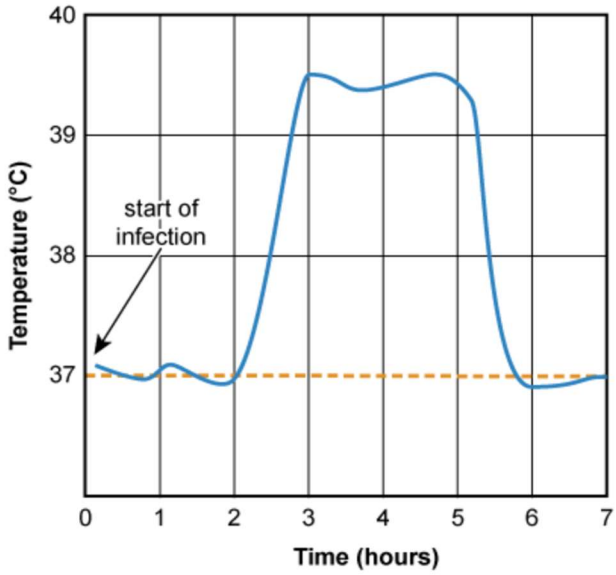
This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 3 correct responses; therefore 1 point will be awarded if the student selects 2 correct responses.

Session 1 Item 15 (TEI) - Rubric

Use the information and your knowledge of science to answer the question.

Infections sometimes occur when viruses or harmful bacteria enter the human body. The infection can then result in body temperature changes. The graph shows these changes in body temperature during an infection compared to a normal body temperature.

Body Temperature Changes during an Infection



Source: Joseph G. Cannon.

Use the graph to select the correct answer from **each** drop-down menu to complete the paragraph.

Infected cells can release chemicals that travel through the bloodstream to alert the brain. The brain then sends signals along [nerve cells] to increase the temperature of the body. White blood cells are brought in to the infected area using the [circulatory system]. Based on the graph, the infected area most likely stops releasing chemicals to alert the brain of an infection [5 hours] after the infection starts.

Session 1 Item 15 (TEI) - Rubric, continued

Scoring Notes:

This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 3 correct responses; therefore 1 point will be awarded if the student selects 2 correct responses.

Session 2 Item 16 (TPD)

Part A

Drag the descriptions into the correct order to show how zebra mussels can affect a waterway.

Part B

Which statement describes the **most effective** way to monitor waterways to prevent the effects of zebra mussels described in Part A?

(a) Take samples of the water to look for zebra mussel waste products.

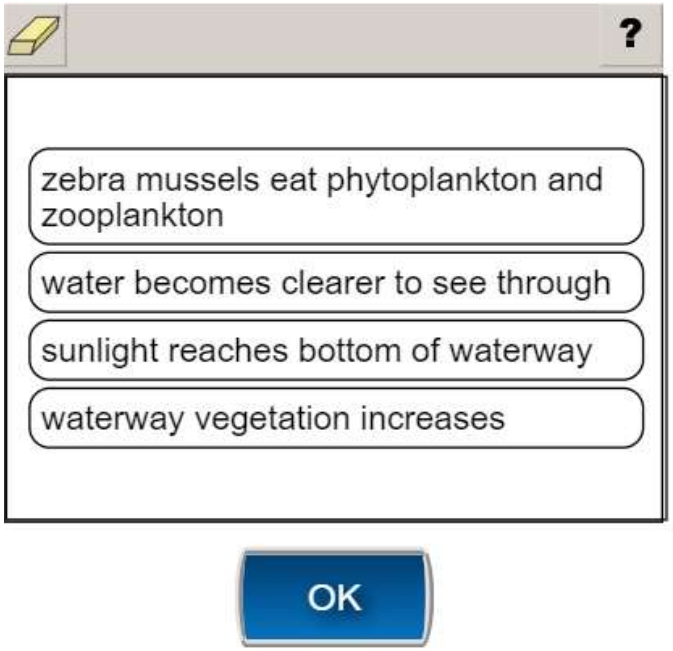
(b) Measure vegetation levels at the bottom of the waterway.

(c) Measure how clear the water is to detect changing phytoplankton and zooplankton levels.

(d) Perform random visual inspections of the bottom of the waterway to look for zebra mussels.

Session 2 Item 16 (TPD) - Rubric

Part A



Part B

Which statement describes the **most effective** way to monitor waterways to prevent the effects of zebra mussels described in Part A?

(a) Take samples of the water to look for zebra mussel waste products.

(b) Measure vegetation levels at the bottom of the waterway.

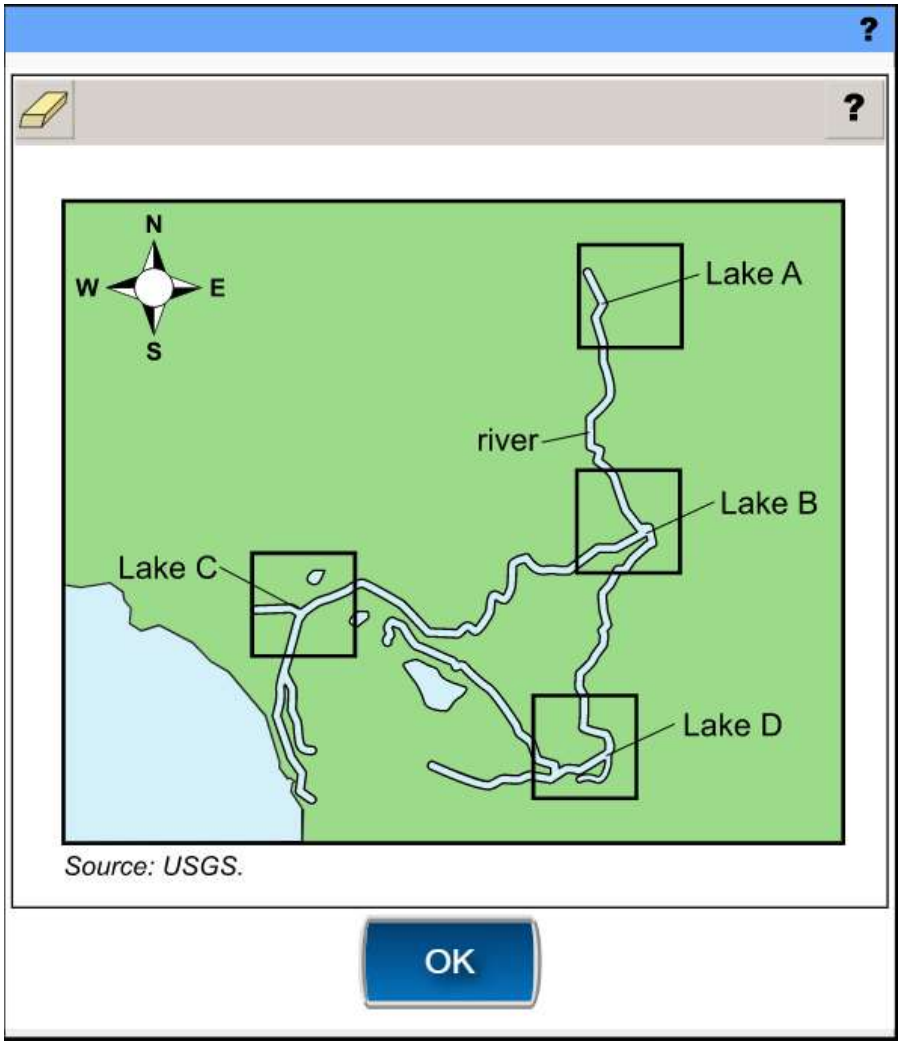
(c) Measure how clear the water is to detect changing phytoplankton and zooplankton levels.

(d) Perform random visual inspections of the bottom of the waterway to look for zebra mussels.

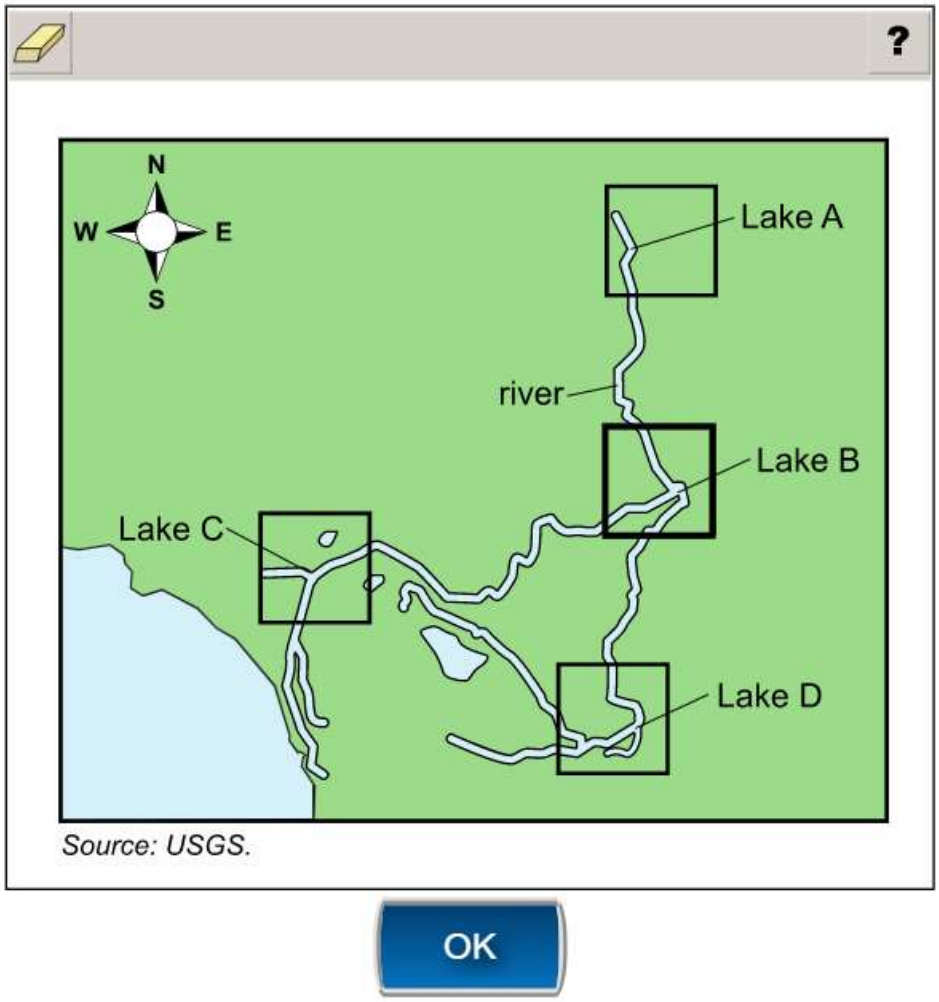
Session 2 Item 18 (TEI)

Park rangers inspect boats before allowing them to enter a water body. Only boats without attached zebra mussels can enter the water body. Mussels similar to zebra mussels were found in water bodies near Lake A along a river.

Select the location showing where an inspection checkpoint would be **most** effective in preventing the further spread of these mussels.



Session 2 Item 18 (TEI) - Rubric



Session 2 Item 20 (ER)

A community depends on a lake that is 85 km (52.82 miles) wide and 86 m (283 feet) deep. The lake has a food web like the one shown in Figure 2. Zebra mussels were accidentally introduced into the lake. Members of the community have researched different ways to control the zebra mussel population. The first table shows this research.

Control Method	How It Works	Disadvantages
carbon dioxide	gas mixed into the water causes zebra mussels to detach from hard surfaces	only works in small areas
1% copper sulfate	chemical mixed into water is poisonous to zebra mussels	affects some fish
biological control	fish that eat zebra mussels are added to lake	added fish change the ecosystem
filtration	water containing unattached zebra mussels is pumped through a filter	can trap fish

Members of the community have developed the following criteria to help them choose the control method to use for the lake:

> The control method must be able to remove zebra mussels from the entire lake AND must preserve the lake's food web.

As you respond to Part A, Part B, and Part C, follow the directions below.

- Address all of the instructions in each prompt.
- Use evidence from the information provided and your own knowledge of science to support your responses.

Part A

Identify the control method that meets the criteria, and explain how this control method will meet these criteria better than the other control methods. Use **three** pieces of evidence from the table to support your explanation.

Part B

Identify a control method that can be combined with the carbon dioxide method to produce a more effective way to remove zebra mussels, and explain why combining these methods would improve on either of the two methods alone.

Part C

Community members learned about a different chemical that can be used to control zebra mussels. Information about this chemical is shown in the second table.

Control Method	How It Works	Disadvantages
calcium chloride	chemical mixed into the water is poisonous to mussels	poisonous to some fish

Describe how calcium chloride will affect **one** organism in the food web shown in Figure 2, other than fish or mussels. Explain your reasoning.

Session 2 Item 20 (ER), continued

Score Points

- An ER item contains multiple parts.
  - The student's score is the sum total of all the points earned across all parts (up to an item-maximum of 9 points) of the item.
- No response (blank) or a response that does not address the prompt, is irrelevant, or too brief to evaluate earns 0 points.

Part A (0–5 points maximum)

- 1 point for identification of the control method that meets the criteria.
- 4 points for explanation of how the control method will meet these criteria better than the other control methods, and use of **three** pieces of evidence from the table to support the explanation.
  - Score 4 points: Correct explanation plus three pieces of evidence.
  - Score 3 points: Correct explanation with two pieces of evidence.
  - Score 2 points: Correct explanation with one piece of evidence.
  - Score 1 point: Explanation with no evidence.

Part B (0–2 points maximum)

- 1 point for identification of a control method that could be combined with the carbon dioxide method to produce a more effective way to remove zebra mussels.
- 1 point for explanation of why combining these methods would improve on either of the two methods alone.

Part C (0–2 points maximum)

- 1 point for description of how calcium chloride will affect one organism in the food web shown in Figure 2, other than fish or mussels.
- 1 point for explanation of reasoning.

Session 2 Item 20 (ER), continued

Score Information

Part A: Student identifies the control method that meets the criteria (1 point), explains how the control method will meet these criteria better than the other control methods (1 point), and uses three pieces of evidence from the table to support the explanation (3 points).

1. The control method that meets the criteria is 1% copper sulfate.

2. 1% copper sulfate kills zebra mussels in the lake, but carbon dioxide and filtration do not.

3. Biological control will introduce a new species into the ecosystem, which will change the food web.

4. Although 1% copper sulfate will kill some, most fish will survive, so it will do a better job at preserving the food web than biological control.

Part B: Student identifies a control method that could be combined with the carbon dioxide method to produce a more effective way to remove zebra mussels (1 point), and explains why combining these methods would improve on either of the two methods alone (1 point).

1. The carbon dioxide control method could be combined with the filtration method to produce a more effective control method.

2. The method would work better to control mussels because once the mussels are detached from the hard surface, they still need to be removed from the water. Passing the water containing the unattached zebra mussels through a filter will make sure the zebra mussels are removed from the water.

Session 2 Item 20 (ER), continued

Part C: Student describes how calcium chloride will affect one organism in the food web shown in Figure 2, other than fish or mussels (1 point) and explains their reasoning (1 point).

- If calcium chloride is used in the lake, the lake will begin to have a decrease in mussels. This will cause an increase in phytoplankton. Phytoplankton will increase because phytoplankton is a food source for mussels.

  -OR-

- If calcium chloride is used in the lake, the lake will begin to have a decrease in mussels. This will cause a decrease in water birds. Water birds will decrease because water birds eat mussels.

  -OR-

- If calcium chloride is used in the lake, the lake will begin to have a decrease in fish. This will cause an increase in scavengers and decomposers. Scavengers and decomposers will increase because fish eat these organisms.

NOTE: Accept other plausible responses

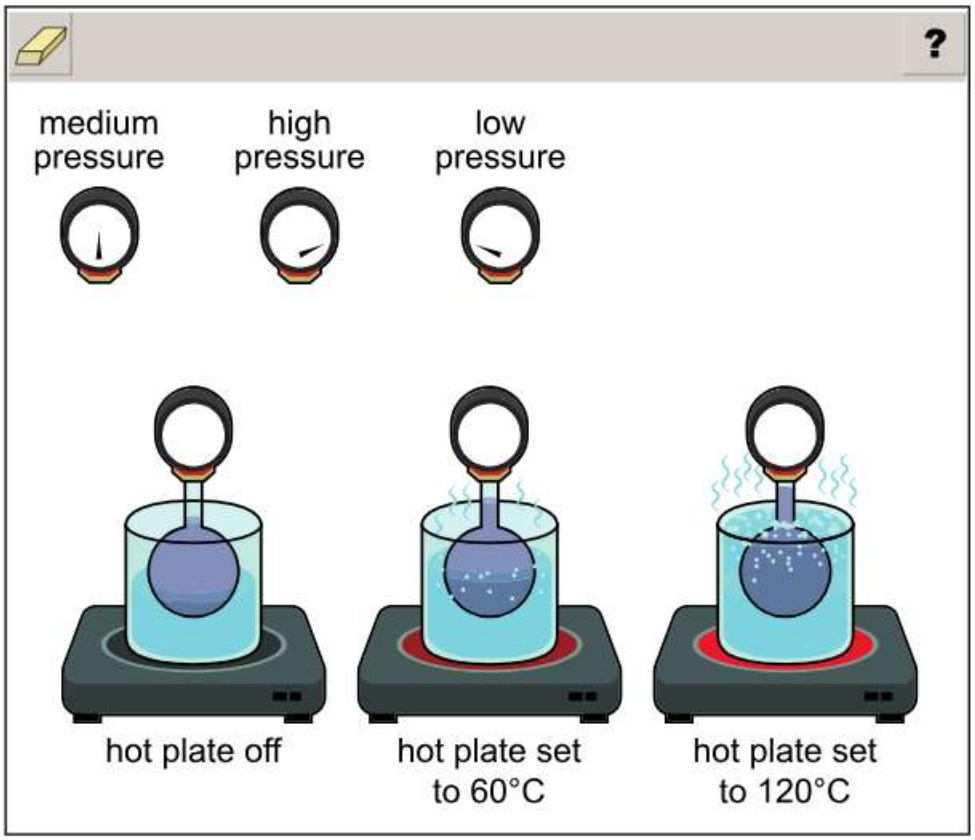
Session 2 Item 22 (TEI)

Use the information and your knowledge of science to answer the question.

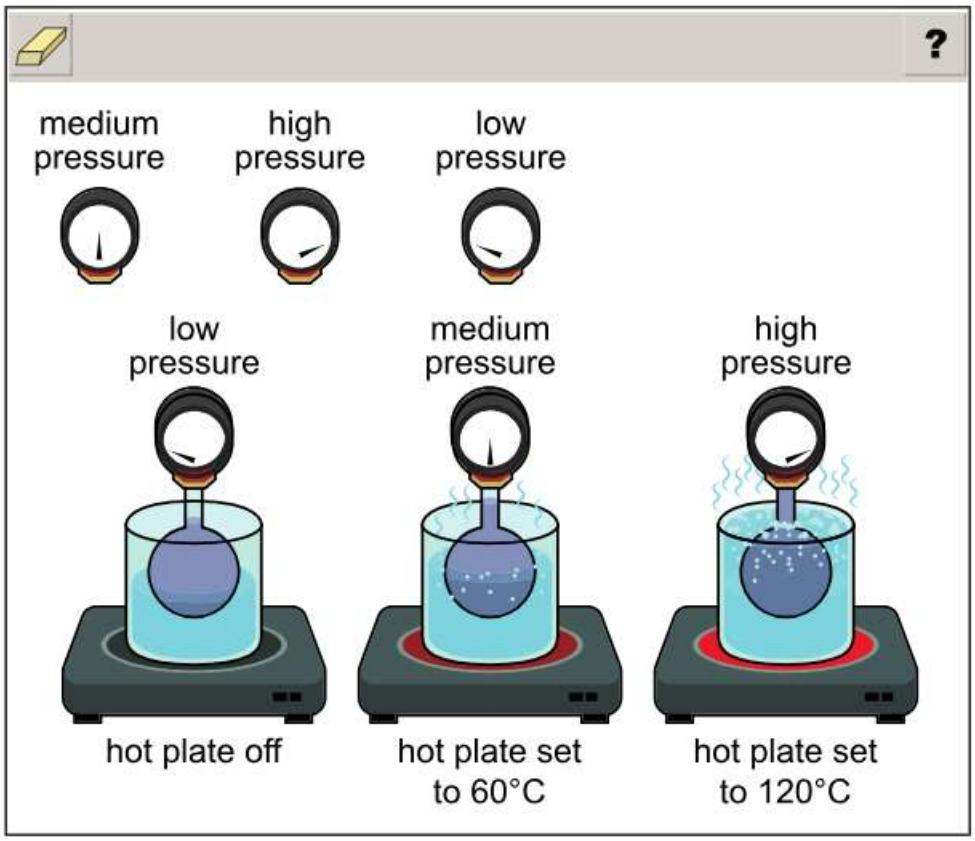
A student is running an experiment to measure how the pressure of a gas changes with temperature. The student will measure the pressure of the gas inside a bulb for three different temperatures, as shown in the experiment setup.

Drag the pressure gauges into the correct boxes to show how the motion of the gas particles at each temperature affects the pressure in the bulb.

Each pressure gauge may be used more than once.



Session 2 Item 22 (TEI) - Rubric



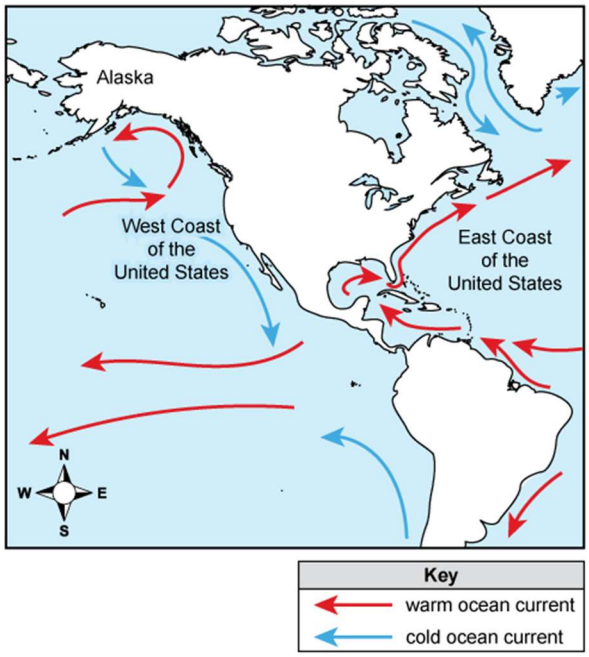
Scoring Notes:

This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 3 correct responses; therefore 1 point will be awarded if the student selects 2 correct responses.

Session 2 Item 23 (TEI)

Use the information and your knowledge of science to answer the question.

Coastal regions are often affected by nearby ocean currents. The map shows how different ocean currents affect the United States.



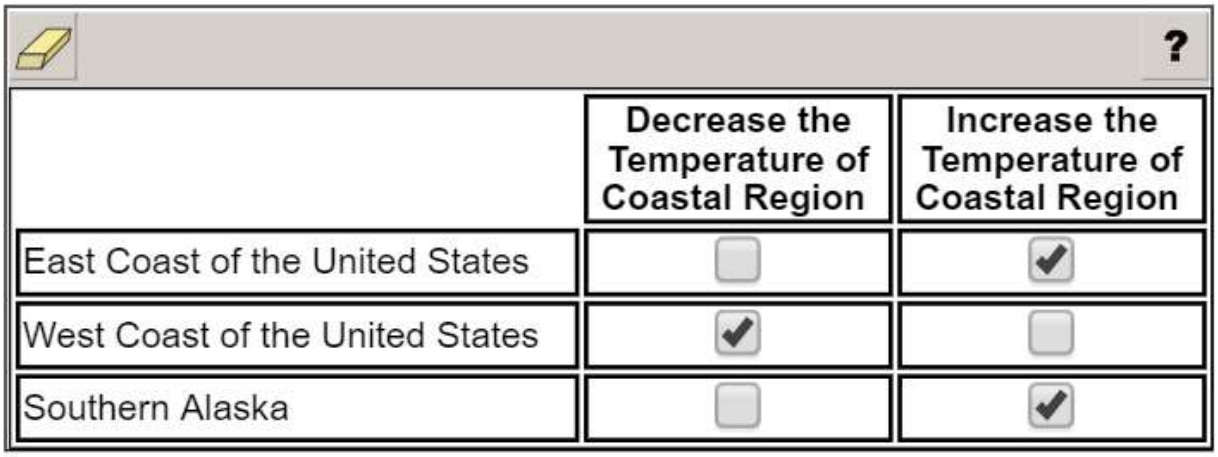
Source: Pearson Education, Inc.

Use the map to complete the table by selecting the boxes that **best** describe how ocean currents affect the climate in each coastal region.

Select **one** box per row.

	Decrease the Temperature of Coastal Region	Increase the Temperature of Coastal Region
East Coast of the United States	☐	☐
West Coast of the United States	☐	☐
Southern Alaska	☐	☐

Session 2 Item 23 (TEI) - Rubric



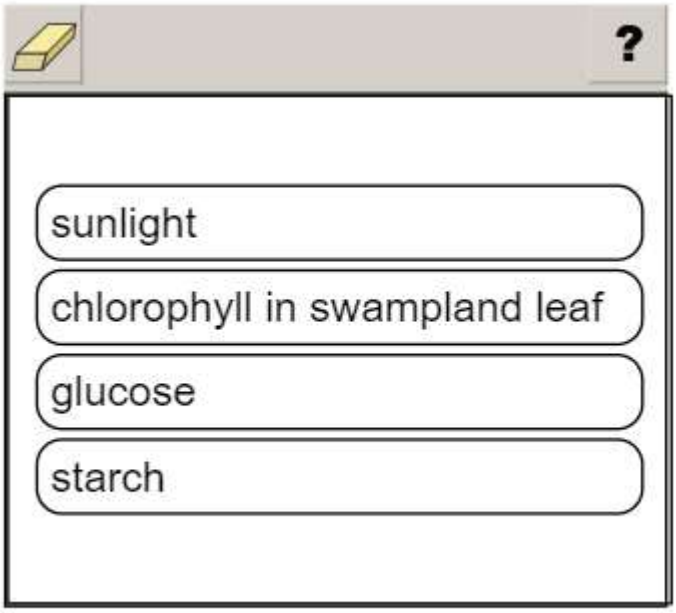
	Decrease the Temperature of Coastal Region	Increase the Temperature of Coastal Region
East Coast of the United States	☐	☑
West Coast of the United States	☑	☐
Southern Alaska	☐	☑

Scoring Notes:

This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 3 correct responses; therefore 1 point will be awarded if the student selects 2 correct responses.

Session 3 Item 24 (TEI) - Rubric

Drag the labels into the correct order to complete the model showing the flow of energy during the swampland leaf experiment.



Session 3 Item 25 (TEI) - Rubric

Select the correct answer from **each** drop-down menu to complete the sentences about the swampland leaf starch test results shown in Figure 2.

The starch test results show that the parts of the leaf covered by the black paper strip produce an amount of glucose that is [less than ▼] the amount of glucose produced by the parts of the leaf exposed to sunlight. This suggests that the amount of photosynthesis that occurs [decreases ▼] when less light is available.

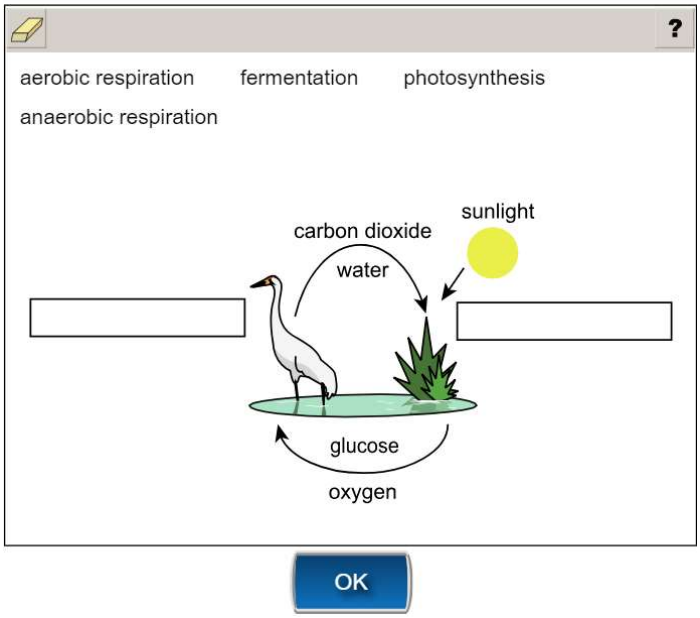
Session 3 Item 26 (TPD)

Part A

A crane is a type of bird that lives in Louisiana swamplands. Cranes eat both plants and animals.

Drag **each** label into the correct box to complete the model showing how matter is cycled between the crane and the plant.

Not all labels will be used.



Part B

Which statement **best** explains one role of energy for the model in Part A?

(a) Glucose reacts with oxygen and absorbs energy from the crane to form carbon dioxide.

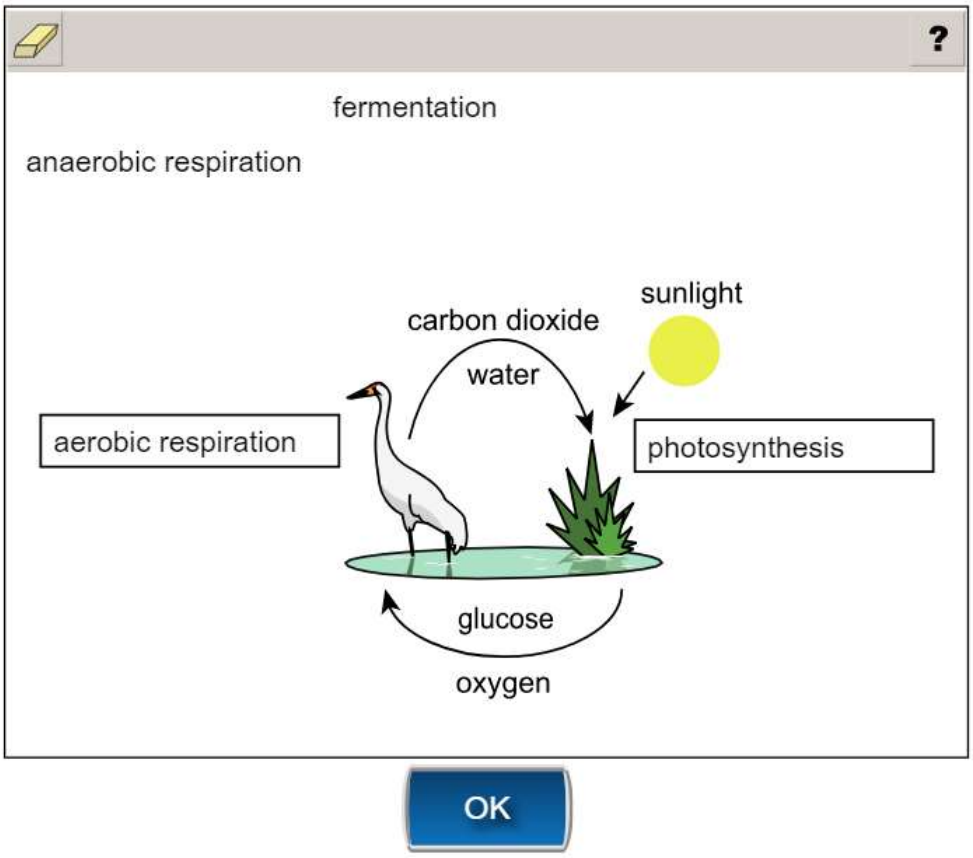
(b) Glucose reacts with oxygen to release energy for the crane to use.

(c) The crane absorbs energy directly from the glucose molecules.

(d) The crane transfers energy to the carbon dioxide molecules.

Session 3 Item 26 (TPD) - Rubric

Part A



Part B

Which statement **best** explains one role of energy for the model in Part A?

(a) Glucose reacts with oxygen and absorbs energy from the crane to form carbon dioxide.

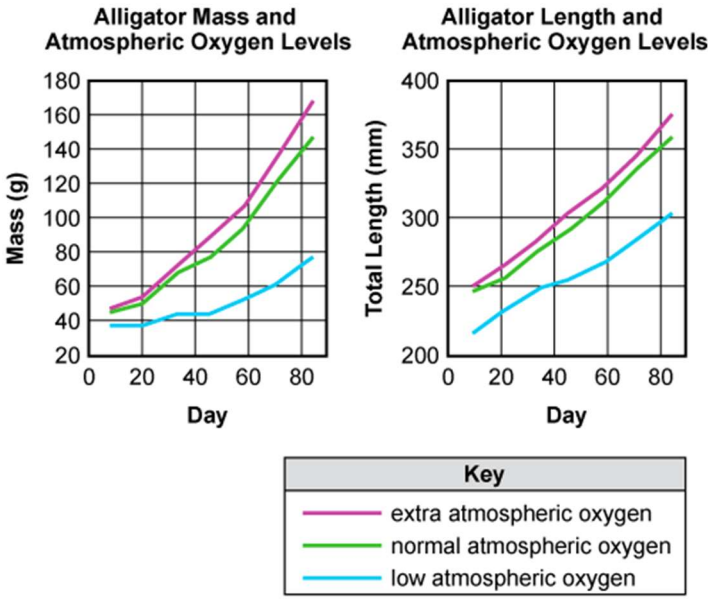
(b) Glucose reacts with oxygen to release energy for the crane to use.

(c) The crane absorbs energy directly from the glucose molecules.

(d) The crane transfers energy to the carbon dioxide molecules.

Session 3 Item 27 (CR)

Trees and other vegetation in swampland ecosystems play a key role in providing oxygen to organisms within the ecosystem. Changes in atmospheric oxygen levels in an ecosystem can have a large impact on the different organisms in that swampland area. Scientists have studied the effect of atmospheric oxygen levels on alligators similar to alligators found in Louisiana swamplands. The results in the two graphs show how atmospheric oxygen levels affected the mass and length of alligators in the early stages of their development.



Source: Journal of Experimental Biology.

Explain how low atmospheric oxygen levels affected alligator growth in terms of cellular respiration.

Session 3 Item 27 (CR), continued

Scoring Information	
Score	**Description**
2	Student's response correctly explains how alligator growth was affected by atmospheric oxygen levels AND explains alligator growth in terms of cellular respiration.
1	Student's response correctly explains how alligator growth was affected by atmospheric oxygen levels OR explains alligator growth in terms of cellular respiration.
0	Student's response does **not** correctly explain how alligator growth was affected by atmospheric oxygen levels or explain alligator growth in terms of cellular respiration. **OR** Student's response is blank, irrelevant, or too brief to evaluate.

Scoring Notes:

- Explanation of how alligator growth was affected by atmospheric oxygen levels (1 point)
- Explanation of alligator growth in terms of cellular respiration (1 point)

Examples include:

- Alligators with low atmospheric oxygen levels were smaller than alligators with normal or high atmospheric oxygen levels because they had less atmospheric oxygen to react with glucose in their body during cellular respiration, which means less energy for building new cells.

Accept other reasonable answers.

Session 3 Item 31 (CR)

A number of atmospheric conditions can contribute to the change from hot and dry weather to monsoon weather observed during Arizona summers.

Explain **one** way that wind pattern data help scientists predict whether a monsoon will form. Explain **one** way that air temperature data help scientists predict whether a monsoon will form.

Scoring Information	
Score	**Description**
2	Student's response correctly explains **one** way that wind pattern data help scientists predict whether a monsoon will form and correctly explains **one** way that air temperature data help scientists predict whether a monsoon will form.
1	Student's response correctly explains **one** way that wind pattern data help scientists predict whether a monsoon will form, but does **not** correctly explain **one** way that air temperature data help scientists predict whether a monsoon will form. **OR** Student's response correctly explains **one** way that air temperature data help scientists predict whether a monsoon will form, but does **not** correctly explain **one** way that wind pattern data help scientists predict whether a monsoon will form.
0	Student's response does **not** correctly explain **one** way that wind pattern data help scientists predict whether a monsoon will form or correctly explain **one** way that air temperature data help scientists predict whether a monsoon will form. **OR** Student's response is blank, irrelevant, or too brief to evaluate.

Scoring Notes:

- Explanation of how wind pattern data help scientists predict whether a monsoon will form (1 point)
- Explanation of how air temperature data help scientists predict whether a monsoon will form (1 point)

Session 3 Item 31 (CR), continued

Examples include:

- The scientists use the wind pattern data to determine the direction in which moisture is moving into the Arizona area from surrounding areas at different times during the year.
- The scientists use the air temperature data to better predict where high- and low-pressure areas are located that contribute to monsoon formation.

Accept other reasonable answers.

Session 3 Item 39 (TPD)

Part A

Which statement **best** describes how selective breeding helps horse breeders produce the most desirable traits for racing?

(a) Selective breeding produces horses with a higher rate of survival due to an increase in the genetic diversity of the horse offspring.

(b) Selective breeding helps breeders control which traits are passed on by producing horse offspring that only have the desired traits.

(c) Selective breeding uses two horse parents with the desired traits to increase the chances of passing the desired traits on to offspring.

(d) Selective breeding uses two horse parents with unknown traits to produce offspring with genetic variations and different traits.

Part B

Select the sentence that **best** identifies a potential negative impact of the selective breeding answer from Part A.

Horse prices had risen artificially high and selective breeding was used to improve the quality of the horses. A decline in mating means more dedication to the idea of quality over quantity among the breed.

Yet even the most purposefully applied selective breeding has produced terrible problems for the Thoroughbred breed. Because the perfect race horse is both fast and light, breeding has focused on Thoroughbreds with huge muscle concentrations but light bones. While Thoroughbreds have become faster over the years, they have also grown more fragile, producing a breed of horse with what one writer called “the heart of a locomotive and champagne-glass ankles.”

Source: The Washington Post Company.

Session 3 Item 39 (TPD) - Rubric

Part A

Which statement **best** describes how selective breeding helps horse breeders produce the most desirable traits for racing?

(a) Selective breeding produces horses with a higher rate of survival due to an increase in the genetic diversity of the horse offspring.

(b) Selective breeding helps breeders control which traits are passed on by producing horse offspring that only have the desired traits.

(c) Selective breeding uses two horse parents with the desired traits to increase the chances of passing the desired traits on to offspring.

(d) Selective breeding uses two horse parents with unknown traits to produce offspring with genetic variations and different traits.

Part B

Select the sentence that **best** identifies a potential negative impact of the selective breeding answer from Part A.

Horse prices had risen artificially high and selective breeding was used to improve the quality of the horses. A decline in mating means more dedication to the idea of quality over quantity among the breed.

Yet even the most purposefully applied selective breeding has produced terrible problems for the Thoroughbred breed. Because the perfect race horse is both fast and light, breeding has focused on Thoroughbreds with huge muscle concentrations but light bones. While Thoroughbreds have become faster over the years, they have also grown more fragile, producing a breed of horse with what one writer called “the heart of a locomotive and champagne-glass ankles.”

Source: The Washington Post Company.

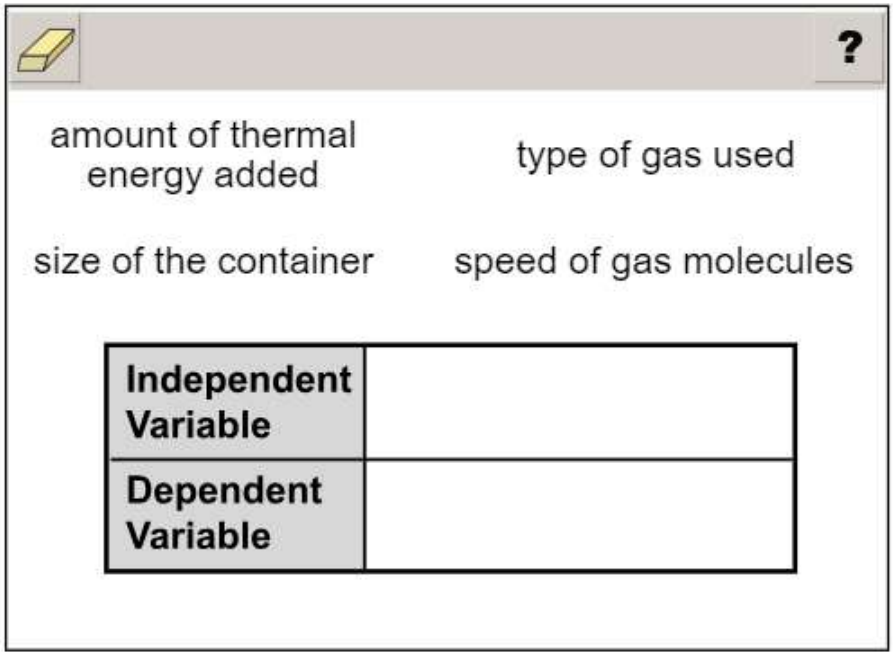
Session 3 Item 40 (TEI)

Use the information and your knowledge of science to answer the question.

Students in a science class are designing an experiment to test how heat affects the kinetic energy of gas molecules. The students will add different amounts of thermal energy to three closed containers of gas.

Drag the correct label into **each** box in the table to identify the independent variable and the dependent variable in the experiment.

Not all labels will be used.



Session 3 Item 40 (TEI) - Rubric