



**pennsylvania**  
DEPARTMENT OF EDUCATION

# The Pennsylvania System of School Assessment

## Science Item and Scoring Sampler

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2015–2016  
Grade 4

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## **INTRODUCTION**

The Pennsylvania Department of Education provides districts and schools with tools to assist in delivering focused instructional programs aligned with the Pennsylvania Academic Standards. In addition to the Academic Standards, these tools include Assessment Anchor documents, assessment handbooks, and content-based item and scoring samplers. Each Item and Scoring Sampler is a useful tool for Pennsylvania educators in preparing local instructional programs and can also be useful in preparing students for the statewide assessment.

## **WHAT IS INCLUDED**

This sampler contains test questions, or test “items,” that have been written to align to the Assessment Anchors that are based on the Pennsylvania Academic Standards (PAS). The sample test questions model the types of items that will appear on an operational PSSA. Each sample test question has been through a rigorous review process to ensure alignment with the Assessment Anchors prior to being piloted in an embedded field test within a PSSA assessment and then used operationally on a PSSA assessment. Answer keys, scoring guidelines, and any related stimulus material are also included. Additionally, sample student responses are provided with each open-ended item to demonstrate the range of responses that students provided in response to these items.

## **PURPOSES AND USES**

The items in this sampler may be used as models for creating assessment items at the classroom level, and they may also be copied and used as part of a local instructional program.<sup>1</sup> Classroom teachers may find it beneficial to have students respond to the open-ended items in this sampler. Educators can then use the item’s scoring guideline and sample responses as a basic guide to score the responses, either independently or together with colleagues within a school or district. The sampler also includes the *General Description of Scoring Guidelines for Science Open-Ended Questions* used to develop the item-specific guidelines. The general description of scoring guidelines can be used if any additional item-specific scoring guidelines are created for use within local instructional programs.<sup>1</sup>

## **ITEM FORMAT AND SCORING GUIDELINES**

The multiple-choice (MC) items have four answer choices. Each correct response to an MC item is worth one point.

Each open-ended (OE) item in science is scored using an item-specific scoring guideline based on a 0–2 point scale.

## **TESTING TIME AND MODE OF TESTING DELIVERY FOR THE PSSA**

The PSSA is delivered in traditional paper-and-pencil format as well as in an online format. The estimated time to respond to a test question is the same for both methods of test delivery. During an official testing administration, students are given additional time as necessary to complete the test questions. The following table shows the estimated response time for each item type.

<b>Science Item Type</b>	<b>MC</b>	<b>OE</b>
Estimated Response Time (in minutes)	1	5

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<sup>1</sup> The permission to copy and/or use these materials does not extend to commercial purposes.

## ITEM AND SCORING SAMPLER FORMAT

This sampler includes the test directions and scoring guidelines that appear in the PSSA Science assessments. Each sample multiple-choice item is followed by a table that includes the alignment, answer key, DOK, the percentage<sup>2</sup> of students who chose each answer option, and a brief answer option analysis or rationale. Each open-ended item is followed by a table that includes the item alignment, DOK, and the mean student score. Additionally, each of the included item-specific scoring guidelines is combined with sample student responses representing each score point to form a practical, item-specific scoring guide. The General Description of Scoring Guidelines for Science used to develop the item-specific scoring guidelines should be used if any additional item-specific scoring guidelines are created for use within local instructional programs.

**Example Multiple-Choice Item Information Table**

Item Information				Option Annotations			
<b>Alignment</b>		Assigned AA/EC		Brief answer option analysis or rationale			
<b>Answer Key</b>		Correct Answer					
<b>Depth of Knowledge</b>		Assigned DOK					
<b><i>p</i>-values</b>							
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>				
Percentage of students who selected each option							

**Example Open-Ended Item Information Table**

Alignment	Assigned AA/EC	Depth of Knowledge	Assigned DOK	Mean Score	

<sup>2</sup> All *p*-value percentages listed in the item information tables have been rounded.

**SCIENCE TEST DIRECTIONS**

Below are the test directions available to students taking the paper-and-pencil version of the assessment. These directions may be used to help students navigate through the assessment.

**Directions:**

On the following pages are the Science questions. There are two types of questions.

**Multiple-Choice Questions**

Some questions will ask you to select an answer from among four choices. These questions will be found in your test booklet.

For the multiple-choice questions:

- Read each question, and choose the best answer.
- Record your choice in the answer booklet.
- Only one of the answers provided is the correct response.

**Open-Ended Questions**

Other questions will require you to write your response. These questions will be found in your answer booklet.

For the open-ended questions:

- Be sure to read the directions carefully.
- If the question asks you to do two tasks, be sure to complete both tasks.
- If the question asks you to compare, be sure to compare. Also, if the question asks you to explain, describe, or identify, be sure to explain, describe, or identify.

**GENERAL DESCRIPTION OF SCORING GUIDELINES  
FOR SCIENCE OPEN-ENDED QUESTIONS**

**2 POINTS**

- The response demonstrates a *thorough* understanding of the scientific content, concepts, and procedures required by the task(s).
- The response provides a clear, complete, and correct response as required by the task(s). The response may contain a minor blemish or omission in work or explanation that does not detract from demonstrating a *thorough* understanding.

**1 POINT**

- The response demonstrates a *partial* understanding of the scientific content, concepts, and procedures required by the task(s).
- The response is somewhat correct with *partial* understanding of the required scientific content, concepts, and/or procedures demonstrated and/or explained. The response may contain some work that is incomplete or unclear.

**0 POINTS**

- The response provides *insufficient* evidence to demonstrate any understanding of the scientific content, concepts, and procedures as required by the task(s) for that grade level.
- The response may show only information copied or rephrased from the question or *insufficient* correct information to receive a score of 1.

**MULTIPLE-CHOICE QUESTIONS**

1. An increase in which human activity would **most likely** result in the most air pollution?
- A. driving cars
  - B. watering plants
  - C. food production
  - D. recycling of plastic

Item Information				Option Annotations
<b>Alignment</b>		S4.A.1.3.5		A. Key: The driving of cars contributes the most air pollution due to the burning of fossil fuels and the large numbers of cars in use. B. The act of watering plants does not release pollutants into the air. C. Comparatively few air pollutants are released during the many processes involved in food production. D. Comparatively few air pollutants are released during the many processes involved in the recycling of plastic.
<b>Answer Key</b>		A		
<b>Depth of Knowledge</b>		2		
<b>p-values</b>				
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	
72%	9%	8%	11%	

Use the table below to answer question 2.

Sunrise Times at Location X

Date	Sunrise Time
January 1	7:43 A.M.
February 1	7:29 A.M.
March 1	6:53 A.M.
April 1	6:03 A.M.
May 1	??

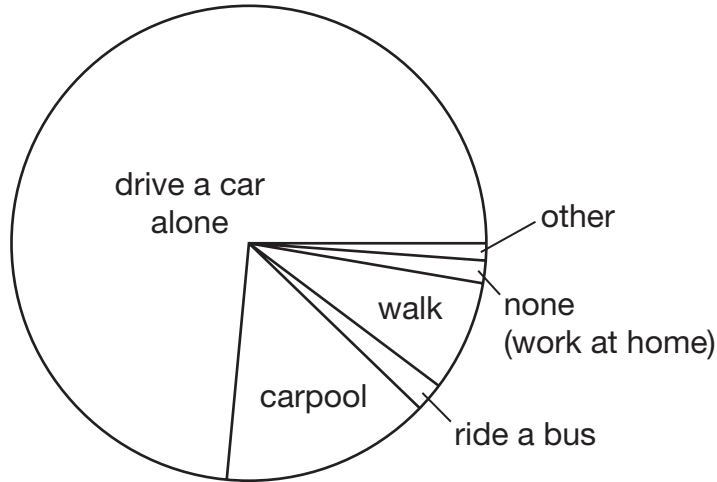
2. About what time did the Sun **most likely** rise on May 1 at location X?
- A. 4:30 A.M.
  - B. 5:19 A.M.
  - C. 6:03 A.M.
  - D. 6:54 A.M.

Item Information				Option Annotations
<b>Alignment</b>		S4.A.2.1.3		A. Based on the pattern in the data, this sunrise time is too early. B. Key: This sunrise time is consistent with the pattern in the data. C. This is the same as the sunrise time for April 1, which does not match the pattern in the data. D. Based on the pattern in the data, this sunrise time is too late.
<b>Answer Key</b>		B		
<b>Depth of Knowledge</b>		2		
<b>p-values</b>				
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	
5%	80%	3%	11%	



Use the circle graph below to answer question 3.

Transportation Taken to Work in Wilkes-Barre, PA

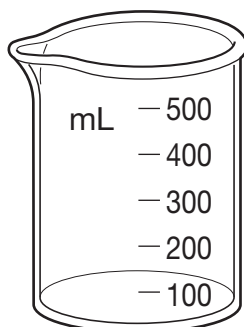


3. Which conclusion can be made based on the data in the circle graph?
- A. More people walk to work than ride a bus.
  - B. Riding a bus in Wilkes-Barre is very expensive.
  - C. Few people enjoy driving a car alone to get to work.
  - D. Carpooling is more popular than driving a car alone.

Item Information				Option Annotations
<b>Alignment</b>		S4.A.2.1.4		A. Key: The section of the graph representing walking is larger than that of riding a bus, so more people walk to work than ride a bus. B. This graph does not display the cost of transportation. C. This graph does not display how many people enjoy driving a car alone. D. Carpooling is used less often than driving a car alone.
<b>Answer Key</b>		A		
<b>Depth of Knowledge</b>		2		
<b>p-values</b>				
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	
71%	8%	15%	5%	

Use the drawing below to answer question 4.

Tool



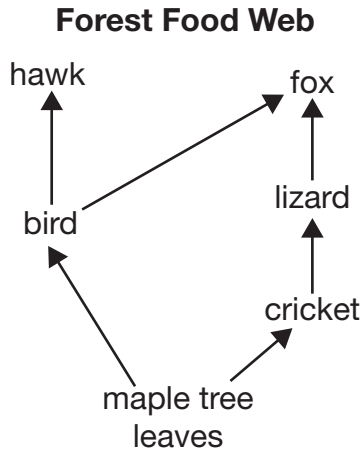
4. Which type of information can a student collect using the tool in the drawing?
- A. mass of a solid
  - B. height of a solid
  - C. volume of a liquid
  - D. temperature of a liquid

Item Information				Option Annotations
<b>Alignment</b>		S4.A.2.2.1		A. Determining the mass of a solid would require a balance, not a beaker. B. Determining the height of a solid would require a meter stick, not a beaker. C. Key: A beaker can be used to measure the volume of a liquid. D. Determining the temperature of a liquid would require a thermometer, not a beaker.
<b>Answer Key</b>		C		
<b>Depth of Knowledge</b>		2		
<b>p-values</b>				
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	
10%	14%	69%	7%	

5. Which two systems are **most likely** both human-made?
- A. a river and a sailboat
  - B. a flower and a beehive
  - C. a planet and a telescope
  - D. a stapler and a computer

Item Information				Option Annotations
<b>Alignment</b>		S4.A.3.1.1		A. A sailboat is human-made, but a river is naturally formed. B. Both systems are naturally formed. C. A telescope is human-made, but a planet is naturally formed. D. Key: Both systems are human-made.
<b>Answer Key</b>		D		
<b>Depth of Knowledge</b>		2		
<b>p-values</b>				
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	
5%	4%	3%	87%	

Use the food web below to answer question 6.

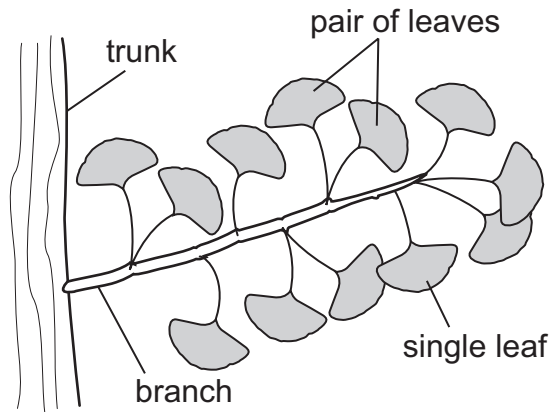


6. Which statement **best** describes sunlight and how it affects this food web?
- A. Sunlight is living and enters the food web through the hawk and the fox.
  - B. Sunlight is living and enters the food web through the maple tree leaves.
  - C. Sunlight is nonliving and enters the food web through the hawk and the fox.
  - D. Sunlight is nonliving and enters the food web through the maple tree leaves.

Item Information				Option Annotations
<b>Alignment</b>		S4.A.3.1.2		A. Sunlight is nonliving. B. Sunlight is nonliving. C. Sunlight is nonliving, but it does not enter food webs through consumers such as the hawk and the fox. D. Key: Sunlight is nonliving and enters food webs through producers such as the maple trees.
<b>Answer Key</b>		D		
<b>Depth of Knowledge</b>		2		
<b>p-values</b>				
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	
10%	29%	11%	49%	

Use the drawing below to answer question 7.

Part of a Tree



7. Which statement **best** describes a pattern in the leaves of this tree?
- A. Single leaves grow farther from the branch than pairs of leaves.
  - B. Single leaves are located closer to the trunk than pairs of leaves.
  - C. Pairs of leaves and single leaves grow on both sides of the branch.
  - D. Pairs of leaves and single leaves only grow on one side of the branch.

Item Information				Option Annotations
<b>Alignment</b>		S4.A.3.3.1		A. Pairs of leaves and single leaves are the same distance from the branch. B. A pair of leaves is located nearest to the trunk. C. Key: Pairs of leaves and single leaves grow on both sides of the branch. D. Pairs of leaves and single leaves grow on both sides of the branch.
<b>Answer Key</b>		C		
<b>Depth of Knowledge</b>		2		
<b>p-values</b>				
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	
11%	6%	77%	7%	

8. Which of the following shows the correct order of a frog’s life cycle?

- A. tadpole → young frog → egg → adult frog
- B. adult frog → egg → young frog → tadpole
- C. egg → tadpole → young frog → adult frog
- D. young frog → egg → adult frog → tadpole

Item Information				Option Annotations
Alignment		S4.B.1.1.5		A. Tadpoles do not develop into eggs, and eggs do not develop into adult frogs. B. Young frogs do not develop into tadpoles. C. Key: Eggs hatch as tadpoles, which develop into young frogs, then develop into adult frogs. D. Young frogs do not develop into eggs, and adult frogs do not develop into tadpoles.
Answer Key		C		
Depth of Knowledge		1		
<i>p-values</i>				
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	
3%	2%	93%	2%	

9. In the spring, some golden eagles fly north over Pennsylvania. In the fall, they fly back south for the winter. Which statement **best** describes why these golden eagles live in southern areas in winter?
- A. In northern areas, there is less food for eagles in winter.
  - B. In northern areas, there are more competing birds in winter.
  - C. In southern areas, there are fewer eagle predators in winter.
  - D. In southern areas, there is more space for eagle nesting in winter.

Item Information		Option Annotations	
<b>Alignment</b>	S4.B.3.2.3	A. Key: Cold weather leads to ice and snow accumulation in northern areas, which decreases the amount of food available to eagles in winter. B. There are fewer birds in northern areas in winter. C. There are few eagle predators regardless of location. D. There is less or equal space in southern areas in winter.	
<b>Answer Key</b>	A		
<b>Depth of Knowledge</b>	2		
<b>p-values</b>			
<b>A</b>	<b>B</b>		
56%	5%	15%	24%

10. Which type of land use is **least likely** in a city?

- A. housing
- B. businesses
- C. large farms
- D. small parks

Item Information				Option Annotations
<b>Alignment</b>		S4.B.3.3.4		A. Housing is a common use of land in cities. B. Businesses are a common use of land in cities. C. Key: Large farms use a lot of land and are typically found outside city limits. D. Small parks are a common use of land in cities.
<b>Answer Key</b>		C		
<b>Depth of Knowledge</b>		1		
<b>p-values</b>				
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	
5%	7%	81%	7%	



11. Which sense can **best** be used to describe the texture of an object?

- A. taste
- B. sight
- C. smell
- D. touch

Item Information				Option Annotations
<b>Alignment</b>		S4.C.1.1.1		A. Taste is a sense for detecting the flavor of an object. B. Sight is the sense for visually observing objects. C. Smell is the sense for detecting aromas or scents. D. Key: Touch is the sense by which a material is perceived by means of physical contact, and texture is a physical structure of a material.
<b>Answer Key</b>		D		
<b>Depth of Knowledge</b>		2		
<b>p-values</b>				
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	
7%	11%	5%	76%	

12. Which forms of energy are produced by the Sun?

- A. light and heat
- B. light and chemical
- C. electrical and heat
- D. electrical and chemical

Item Information					Option Annotations
<b>Alignment</b>		S4.C.2.1.1			A. Key: Light and heat are produced by the Sun. B. Chemical energy is not produced by the Sun. C. Electrical energy is not produced by the Sun. D. Chemical and electrical energy are not produced by the Sun.
<b>Answer Key</b>		A			
<b>Depth of Knowledge</b>		2			
<b><i>p</i>-values</b>					
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>		
84%	4%	9%	3%		

Use the drawing below to answer question 13.

Farm



13. Which statement **best** describes the location of some objects in the drawing?

- A. The house is behind the trees.
- B. The stream is in front of the geese.
- C. The rock is to the right of the horse.
- D. The horse is to the left of the house.

Item Information				Option Annotations
<b>Alignment</b>		S4.C.3.1.3		A. The house is in front of the trees. B. Key: The stream is in front of the geese. C. The rock is to the left of the horse. D. The horse is to the right of the house.
<b>Answer Key</b>		B		
<b>Depth of Knowledge</b>		2		
<b>p-values</b>				
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	
7%	76%	6%	10%	

14. Which statement **best** explains why sinkholes form over salt beds more easily than over harder rock?
- A. Salt is more easily removed by groundwater.
  - B. Salt beds are only found on the bottom of lakes.
  - C. Hard rocks are more easily removed by groundwater.
  - D. Hard rocks are only found toward the tops of mountains.

Item Information				Option Annotations
<b>Alignment</b>		S4.D.1.1.1		A. Key: Water dissolves salt more easily than it dissolves hard rock. B. Locations of salt beds are not limited to lakes. C. Hard rocks are not easily dissolved by groundwater. D. Hard rocks are found at all elevations.
<b>Answer Key</b>		A		
<b>Depth of Knowledge</b>		2		
<b>p-values</b>				
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	
55%	20%	13%	12%	

15. One student makes a model of a lake and another student makes a model of a river. Which statement **best** describes the water in one of the models?
- A. The lake model contains salt water.
  - B. The lake model contains cold water.
  - C. The river model contains muddy water.
  - D. The river model contains flowing water.

Item Information				Option Annotations
<b>Alignment</b>		S4.D.1.3.3		A. Most lakes contain fresh water. B. Both lakes and rivers can contain cold water. C. Both lakes and rivers can contain muddy water. D. Key: Rivers are characterized by flowing water.
<b>Answer Key</b>		D		
<b>Depth of Knowledge</b>		2		
<i>p-values</i>				
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	
9%	10%	9%	72%	

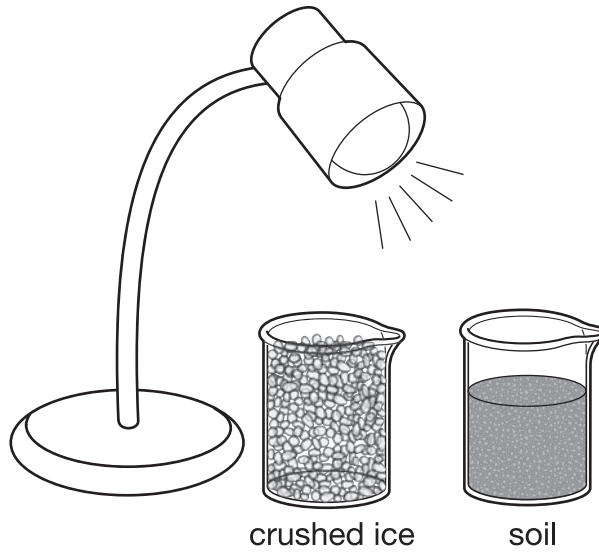
16. Which statement describes the movement of objects in the Sun-Earth-Moon system?

- A. Earth travels around the Moon and the Sun.
- B. The Sun travels around Earth and the Moon.
- C. Earth travels around the Sun, and the Moon travels around Earth.
- D. The Sun travels around Earth, and the Moon travels around Earth.

Item Information				Option Annotations
<b>Alignment</b>		S4.D.3.1.1		A. Earth does not travel around the Moon. B. The Sun does not travel around Earth or the Moon. C. Key: Earth travels around the Sun, and the Moon travels around Earth. D. The Sun does not travel around Earth.
<b>Answer Key</b>		C		
<b>Depth of Knowledge</b>		2		
<b>p-values</b>				
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	
16%	9%	61%	14%	

OPEN-ENDED QUESTIONS

Use the drawings below to answer question 17.



17. A student placed these two objects directly beneath a lamp for 10 minutes. Describe how each object was **most likely** affected by the lamp.

**Crushed ice:** \_\_\_\_\_

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**Soil:** \_\_\_\_\_

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**SCORING GUIDE**

**#17 ITEM INFORMATION**

<b>Alignment</b>	S4.A.1.3.3	<b>Depth of Knowledge</b>	2	<b>Mean Score</b>	1.42
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**ITEM-SPECIFIC SCORING GUIDELINE**

<b>Score</b>	<b>Description</b>
<b>2</b>	<p>The response demonstrates a <i>thorough</i> understanding of the change to objects caused by temperature change or light by:</p> <ul style="list-style-type: none"> <li>• describing how the crushed ice was most likely affected by the lamp</li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>• describing how the soil was most likely affected by the lamp.</li> </ul> <p>The response is clear, complete, and correct.</p>
<b>1</b>	<p>The response demonstrates a <i>partial</i> understanding of the change to objects caused by temperature change or light by:</p> <ul style="list-style-type: none"> <li>• describing how the crushed ice was most likely affected by the lamp</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• describing how the soil was most likely affected by the lamp.</li> </ul> <p>The response may contain some work that is incomplete or unclear.</p>
<b>0</b>	<p>The response provides <i>insufficient</i> evidence to demonstrate any understanding of the concept being tested.</p>
<b>Non-scorables</b>	<p>B – No response written                      R – Refusal to respond                      F – Foreign language                      K – Off task                      U – Unreadable</p>

**Note: No deductions should be taken for misspelled words or grammatical errors.**



**Responses that will receive credit:**

**Crushed ice (1 point):**

- Some (or all) of the ice melted and changed into a liquid (water).
- The level of the ice in the beaker decreased.
- The movement of molecules in the ice sped up.
- Energy was added to the ice.

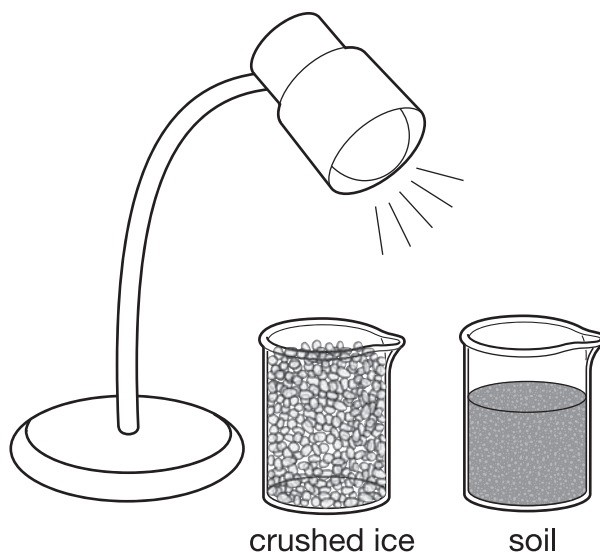
**Soil (1 point):**

- The soil becomes warmer on top.
- The soil becomes drier on top.
- Energy was added to the soil.

## STUDENT RESPONSE

RESPONSE SCORE: 2 POINTS

Use the drawings below to answer question 17.



17. A student placed these two objects directly beneath a lamp for 10 minutes. Describe how each object was **most likely** affected by the lamp.

Crushed ice: The Ice probably melted. The light provides heat too, and crushed Ice is cold, so it probably melted.

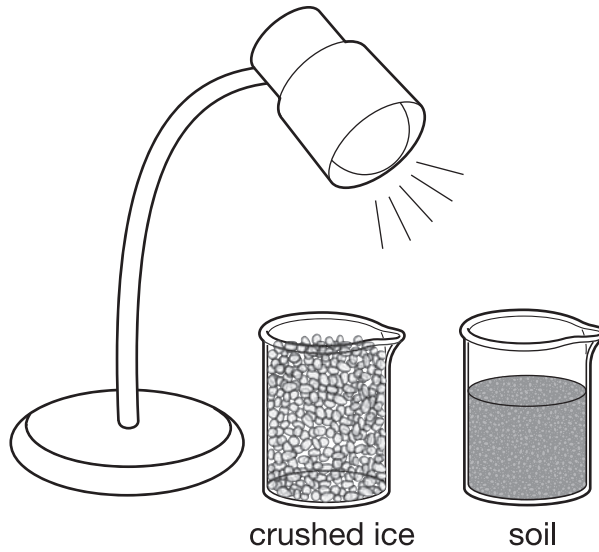
Soil: It probably got really dry and crusty. Soil needs to keep moist, and with the heat from the light it most likely dried up.

This response demonstrates a thorough understanding of the changes to objects caused by the lamp. For both the ice and the soil, the student describes a probable change and explains that heat from the lamp would cause the changes.

**STUDENT RESPONSE**

**RESPONSE SCORE: 1 POINT**

Use the drawings below to answer question 17.



17. A student placed these two objects directly beneath a lamp for 10 minutes. Describe how each object was **most likely** affected by the lamp.

Crushed ice: it will melt

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Soil: it won't melt.

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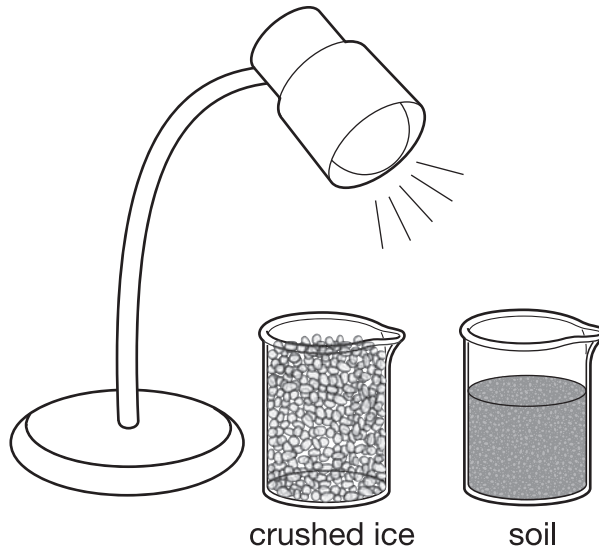
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This response demonstrates a partial understanding of the effects of the lamp on the objects. "It will melt" correctly identifies an effect on the ice, but no effect on the soil is described.

**STUDENT RESPONSE**

**RESPONSE SCORE: 0 POINTS**

Use the drawings below to answer question 17.



17. A student placed these two objects directly beneath a lamp for 10 minutes. Describe how each object was **most likely** affected by the lamp.

Crushed ice: of corse crushed ice is gonna be afected by the lamp

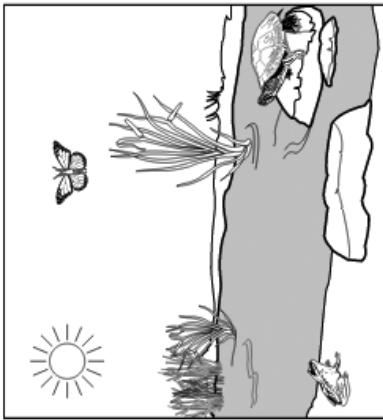
Soil: the soil will not get affected by the lamp.

This response provides insufficient evidence to demonstrate any understanding of the changes to objects caused by exposure to heat or light. "Of corse crushed ice is gonna be affected by the lamp" does not explain what that effect would be.

Question 18



Use the diagram below to answer the question.



A community park has a pond.

**Part A:** Identify one living and one nonliving thing at the pond.

Eq

0 / 1000

**Part B:** Describe one role of a nonliving thing in the pond ecosystem.

Eq

0 / 1000

Review/End Test

Pause

Flag

Options

Back

**SCORING GUIDE**

**#18 ITEM INFORMATION**

<b>Alignment</b>	S4.A.3.1.3	<b>Depth of Knowledge</b>	2	<b>Mean Score</b>	1.34
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**ITEM-SPECIFIC SCORING GUIDELINE**

<b>Score</b>	<b>Description</b>
<b>2</b>	The response demonstrates a <i>thorough</i> understanding of how to categorize the parts of an ecosystem as living or nonliving and describe their roles in the system by identifying one living and one nonliving thing at the pond and by describing one role of the nonliving thing identified. Response may contain a minor blemish (e.g., misspelled words) or omission in work or explanation that does not detract from demonstrating a thorough understanding.
<b>1</b>	The response demonstrates a <i>partial</i> understanding of how to categorize the parts of an ecosystem as living or nonliving and describe their roles in the system by identifying one living and one nonliving thing at the pond or by describing one role of a nonliving thing at the pond. A response that only identifies a living thing at the pond is insufficient for earning a score of one. The response is somewhat correct with partial understanding of the required scientific content, concepts, and/or procedures demonstrated and/or explained. The response may contain some work that is incomplete or unclear.
<b>0</b>	The response provides <i>insufficient</i> evidence to demonstrate any understanding of how to categorize the parts of an ecosystem as living or nonliving and describe their roles in the system. Response may show only information copied or rephrased from the question. Nothing is correct, relevant, or sufficient to earn a score of one.
<b>Non-scorables</b>	B – No response written R – Refusal to respond F – Foreign language K – Off task U – Unreadable

**Note: No deductions should be taken for misspelled words or grammatical errors.**

**Responses that will receive credit:**

**Part A: One living and one nonliving thing.**

- *Living*: aquatic plants, frog, turtle, or butterfly
- *Nonliving*: sunlight, rocks, air, water, or soil

**Part B: One role of the nonliving thing.**

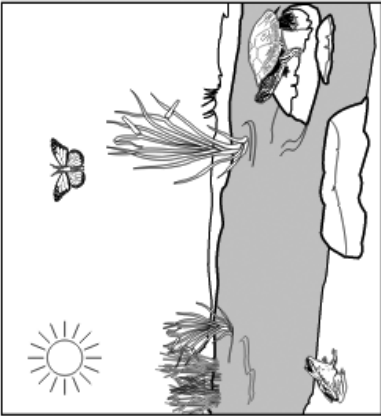
- The sunlight provides energy for the plants to do photosynthesis.  
**OR**
- The rocks provide a place for the turtle to rest.  
**OR**
- The air provides oxygen for the plants, turtle, and frog.  
**OR**
- The water provides a place for the frog and turtle to live.  
**OR**
- The soil provides nutrients for the plants.

STUDENT RESPONSE

RESPONSE SCORE: 2 POINTS

Question 18

Use the diagram below to answer the question.



A community park has a pond.

**Part A:** Identify one living and one nonliving thing at the pond.

One nonliving is the water and one living thing is frog.

**Part B:** Describe one role of a nonliving thing in the pond ecosystem.

One role of the water is to provide a home for animals.

56 / 1000

55 / 1000

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Review/End Test

Pause

Flag

Options







This response demonstrates a thorough understanding of the categories of living vs. nonliving things and correctly describes a role of one of the nonliving elements in the pond ecosystem. Part A is correct; Part B—water provides “a home for animals” is an acceptable role in the ecosystem.



STUDENT RESPONSE

RESPONSE SCORE: 1 POINT

Question 18
?

**Part A:** Identify one living and one nonliving thing at the pond.

One thing living in the pond is a turtle. Also, one nonliving thing I see in the pond is a rock.

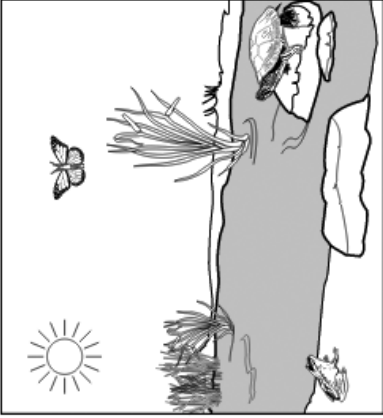
97 / 1000

**Part B:** Describe one role of a nonliving thing in the pond ecosystem.

One nonliving thing in the pond ecosystem is a rock because a rock doesn't swim, grow, or walk. Also it doesn't help the animals in any way.

140 / 1000

**Use the diagram below to answer the question.**



A community park has a pond.

Review/End Test
Pause
Flag
Options

Back

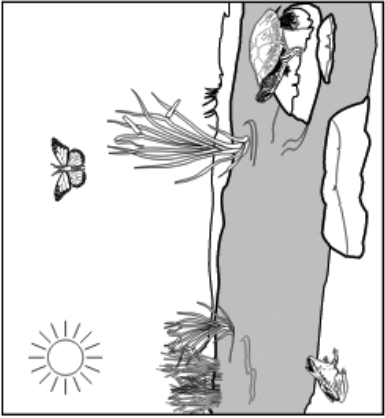
This response demonstrates a partial understanding of the roles of living and nonliving things within an ecosystem. Part A is correct. In Part B, the student describes why the rock is nonliving, not its role in the ecosystem.

STUDENT RESPONSE

RESPONSE SCORE: 0 POINTS

Question 18

Use the diagram below to answer the question.



A community park has a pond.

**Part A:** Identify one living and one nonliving thing at the pond.

One living thing in the pond is the frog. One nonliving thing is the plant.

**Part B:** Describe one role of a nonliving thing in the pond ecosystem.

The plant makes a habitat for the frog.

75 / 1000

39 / 1000

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Review/End Test

Pause

Flag

Options

This response provides insufficient evidence to demonstrate any understanding of the concepts being tested. In Part A, the student identifies a plant as a nonliving thing, and in Part B, the student describes the role of a living thing, rather than a nonliving thing, in the pond ecosystem.

SCIENCE GRADE 4—SUMMARY DATA

MULTIPLE-CHOICE

Sample Number	Alignment	Answer Key	Depth of Knowledge	p-values			
				A	B	C	D
1	S4.A.1.3.5	A	2	72%	9%	8%	11%
2	S4.A.2.1.3	B	2	5%	80%	3%	11%
3	S4.A.2.1.4	A	2	71%	8%	15%	5%
4	S4.A.2.2.1	C	2	10%	14%	69%	7%
5	S4.A.3.1.1	D	2	5%	4%	3%	87%
6	S4.A.3.1.2	D	2	10%	29%	11%	49%
7	S4.A.3.3.1	C	2	11%	6%	77%	7%
8	S4.B.1.1.5	C	1	3%	2%	93%	2%
9	S4.B.3.2.3	A	2	56%	5%	15%	24%
10	S4.B.3.3.4	C	1	5%	7%	81%	7%
11	S4.C.1.1.1	D	2	7%	11%	5%	76%
12	S4.C.2.1.1	A	2	84%	4%	9%	3%
13	S4.C.3.1.3	B	2	7%	76%	6%	10%
14	S4.D.1.1.1	A	2	55%	20%	13%	12%
15	S4.D.1.3.3	D	2	9%	10%	9%	72%
16	S4.D.3.1.1	C	2	16%	9%	61%	14%

OPEN-ENDED

Sample Number	Alignment	Points	Depth of Knowledge	Mean Score
17	S4.A.1.3.3	2	2	1.42
18	S4.A.3.1.3	2	2	1.34

# **PSSA Grade 4 Science Item and Scoring Sampler**

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