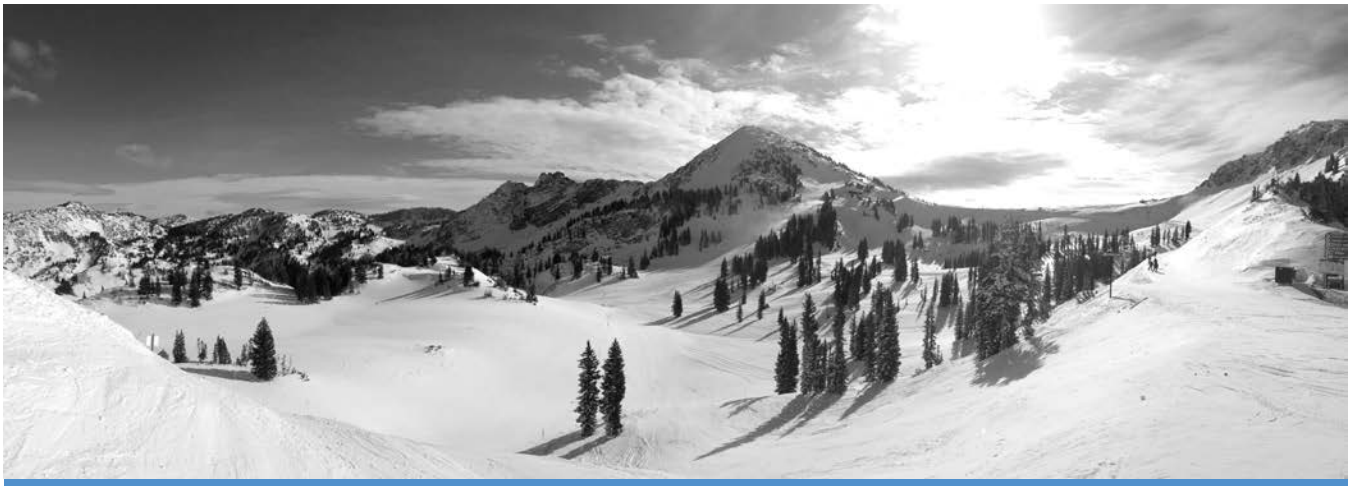
Colorado Measures of Academic Success



Grade 5 Science

Answer Key with Scoring Rubrics

Practice Resource for Students

1139067 1 2 3 4 5 A B C D E Printed in the USA ISD36175

Table of Contents

ITEM INFORMATION

Colorado Academic Standard (CAS) Evidence Outcome

Describes the evidence that demonstrates that a student is meeting the grade level expectation at a mastery level.

Disciplinary Core Ideas

The Disciplinary Core Ideas (DCIs) form the basis for the content that students are expected to know by the end of the grade level and are present in every item.

Science and Engineering Practices

The Science and Engineering Practices (SEPs) in the CAS are interwoven within certain items, and all SEPs are assessed according to the SEP progressions. The SEP is the first few words of the Evidence Outcome. If an SEP is not present in an item, then the item will not ask the student to demonstrate knowledge of the first part of the Evidence Outcome.

Cross Cutting Concepts

Crosscutting concepts (CCCs) have applications across all domains of science. As such, they are a way of linking the different domains of science. The CCCs in the CAS are interwoven within certain items. Each CCC found in the CAS is assessed according to the CCC progressions.

Scenarios for Items

Items are driven by high-quality scenarios that are grounded in phenomena or problems. All scenarios are puzzling and intriguing and are explainable using grade appropriate integration of the three dimensions of the 2020 CAS. Scenarios are presented in three ways: simulations, clusters, and standalone items.

Simulations

Students are presented with an interactive simulation of a science model or experiment and asked to make sense of the observed phenomenon. They answer multiple two- or three-dimensional questions related to the content using their knowledge of the 2020 CAS.

Clusters

Students are presented with background information, still images, graphs, tables, and additional media and asked to make sense of the described phenomenon. Using their knowledge of the 2020 CAS, they answer multiple two- or three-dimensional questions related to the content.

Standalone Items

Students are presented with a unique phenomenon and asked to make sense of that phenomenon based on the information in the stimulus. They answer the two- or three-dimensional question using their knowledge of the 2020 CAS.

Simulation and cluster scenarios comprise the majority of the assessment as students are asked to make sense of a larger phenomenon and answer questions associated with those scenarios. Standalone items are included only to target a small number of 2020 CAS Evidence Outcomes not represented in simulation and cluster scenarios. These Evidence Outcomes rotate on an annual basis.

ITEM TYPES

Items are questions that appear on the assessments. They are presented in three different ways.

Selected Response (Multiple Choice, Multiple Response, and Fill in the Blank):

For multiple choice and multiple response items, students select a correct answer out of provided choices. For fill in the blank items, students type/write their answer in a blank box.

Technology-Enhanced (Bar Graph, Drag and Drop, Inline Choice, Hot Spot, and Match Table Grid):

Students show their answer using technology, such as by creating a bar graph using a template provided by the online testing system or on the paper-based test. Drag and drop items require students to drag answer choices into correct answer bays (draw lines or write corresponding letters for paper-based testing). Inline choice items require students to select their answer from a drop-down menu (circle answer from a list of choices for paper-based testing) to complete a sentence or sentences. Hot spot items require students to select the correct response from its location in an image (write corresponding letters or circle answer for paper-based testing). Match table grid items require students to check checkboxes in cells to indicate a match between the column and row labels.

Constructed Response:

Students construct an open-ended response.

STUDENT PERFORMANCE

P Value – Selected Response Only

The P value represents the percentage of students who answered each selected response question correctly. For example, if the P value associated with a question is 0.64, then 64% of students responded to the question with the correct answer.

Score Point Distribution – Constructed Response Only

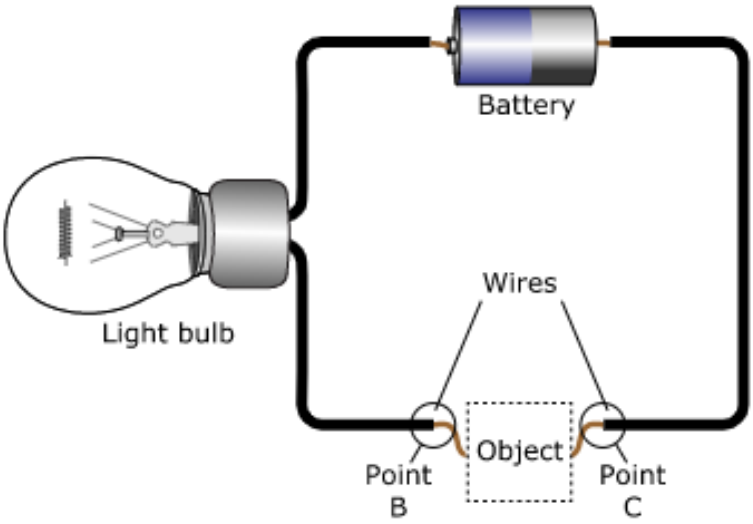
The score point distribution provides the percentage of students who scored at each possible score point for constructed response questions.

In addition to score point distribution, the scoring guide, scoring rubric, and sample student responses at each score point are provided for constructed response items.

ANSWER KEY: ITEM SET 1

Item Set 1 – Question 1 (TEI Inline Choice)

Students investigate a circuit. They observe that the light bulb only turns on when certain materials are placed between points B and C.



Using their observations, they separate the materials they are testing into two groups. The table shows their groupings.

Materials

Group A	Group B
iron nail	rubber eraser
copper penny	plastic button
steel paper clip	wood stick

Select one correct response from each drop-down menu to complete the sentences.

The property the students tested was whether each material [conducts electricity] . A comparison can be made between the penny and the paper clip to see which one is [the better conductor] by testing to see which one [makes the light shine brighter] .

Item Information		
Answer:	See Image	
Grade Level Expectation:	SC.5.1.1	Matter exists as particles that are too small to be seen; measurements of a variety of observable properties can be used to identify particular materials.
Evidence Outcome:	SC.5.1.1.b	Make observations and measurements to identify materials based on their properties.
Standard:	Physical Science	

Item Set 1 – Question 2 (Selected Response)

The students plan to use a different set of materials to be models for the behavior of the oil and water used in Part 1. Which materials, if shaken, would **most** accurately be models for the behavior of the water and vegetable oil in the bottle?

○ A.

Science in a Bottle Setup	Model
water	clear marbles
vegetable oil	yellow marbles

◉ B.

Science in a Bottle Setup	Model
water	salt
vegetable oil	yellow marbles

○ C.

Science in a Bottle Setup	Model
water	clear marbles
vegetable oil	pepper

○ D.

Science in a Bottle Setup	Model
water	pepper
vegetable oil	salt

Item Information		
Answer:	B	
Grade Level Expectation:	SC.5.1.1	Matter exists as particles that are too small to be seen; measurements of a variety of observable properties can be used to identify particular materials.
Evidence Outcome:	SC.5.1.1.a	Develop a model to describe that matter is made of particles too small to be seen.
Standard:	Physical Science	

Item Set 1 – Question 3 (Selected Response)

After the tablet in the investigation in Part 2 has completely dissolved, a student unscrews the cap to the bottle. As the cap loosens, the students hear a hissing sound. What is the **most likely** explanation for the hissing sound?

- (●) A. Small particles of gaseous matter exit the bottle.
- ( ) B. Small bubbles in the bottle turn back into water.
- ( ) C. The oil and water mix to form a single layer.
- ( ) D. The food coloring dissolves into the oil.

Item Information		
Answer:	A	
Grade Level Expectation:	SC.5.1.1	Matter exists as particles that are too small to be seen; measurements of a variety of observable properties can be used to identify particular materials.
Evidence Outcome:	SC.5.1.1.a	Develop a model to describe that matter is made of particles too small to be seen.
Standard:	Physical Science	

Item Set 1 – Question 4 (Multiple Select)

Students repeat the investigation in Part 2, but this time they weigh the tablet as well as the bottle and its contents before and after the investigation. The students do not put the cap on the bottle after the tablet is added.

Which statement predicts what the students will observe in the investigation, and which description correctly explains their observation? Select **two** correct answer choices.

- ☐ A. The mass of the bottle after the investigation was greater than the mass of the bottle and tablet before the investigation.
- ☐ B. The mass of the bottle after the investigation was the same as the mass of the bottle and tablet before the investigation.
- ☑ C. The mass of the bottle after the investigation was less than the mass of the bottle and tablet before the investigation.
- ☐ D. This is evidence that no new substance was formed as the matter in the tablet was destroyed.
- ☑ E. This is evidence that a new substance was formed and left the bottle as a gas.

Item Information		
Answer:	C, E	
Grade Level Expectation:	SC.5.1.2	Chemical Reactions that occur when substances are mixed can be identified by the emergence of substances with different properties; the total mass remains the same.
Evidence Outcome:	SC.5.1.2.b	Conduct an investigation to determine whether the mixing of two or more substances results in new substances.
Standard:	Physical Science	

Item Set 1 – Question 5 (Constructed Response)

A bottle of water and a bottle of clear oil are on a table. The students notice that the liquid in the bottles looks the same.

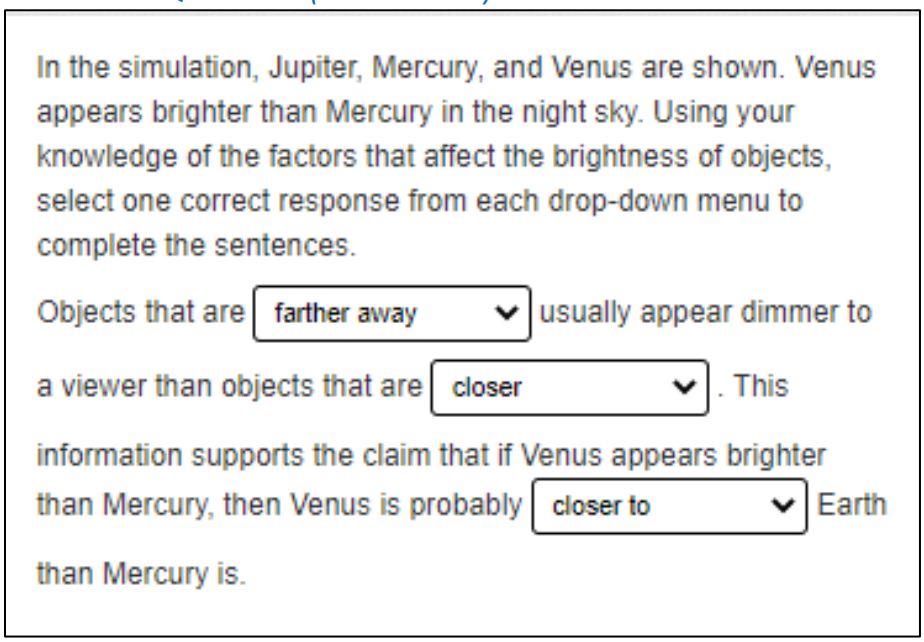
Use the information in Part 1 to explain how a student can use food coloring to correctly identify the oil and the water. Your response should include a description of:

- how a student can use the way that food coloring behaves in water to identify a substance as water
- how a student can use the way that food coloring behaves in oil to identify a substance as oil

Item Information		
Answer:	See Sample Student Responses	
Grade Level Expectation:	SC.5.1.1	Matter exists as particles that are too small to be seen; measurements of a variety of observable properties can be used to identify particular materials.
Evidence Outcome:	SC.5.1.1.b	Make observations and measurements to identify materials based on their properties.
Standard:	Physical Science	

Sample Student Responses *Sample student responses are not representative of all correct answers for an item and are provided only as a guide to assist teachers with scoring.*	
Points	
2	**Sample Response**
	It dissolves in water. It does not dissolve in oil.
	Sample Annotation
	This response demonstrates a complete understanding of the task. The student describes the behavior of the food coloring both in the water (*It dissolves*) and in the oil (*It does not dissolve*).
1	**Sample Response**
	The students can put food coloring in the bottles. The food color doesn't dissolve in the oil, it just lays at the bottom of the bottle until you swirl it around, then it just makes a bunch of little bubble in the oil, like a snow globe.
	Sample Annotation
	This response demonstrates a partial understanding of the task because it is incomplete. Only the behavior of food coloring in vegetable oil is described *(The food color doesn't dissolve in the oil, it just lays at the bottom until you swirl it … makes a bunch of little bubble).* The behavior of food coloring in vegetable water is not described.
0	**Sample Response**
	They could pour some on their hand. If it's wet, it's water. If it feels slimy, it's oil.
	Sample Annotation
	This response does not demonstrate an understanding of the task because it does not address the behavior of food coloring with either liquid. Although a tactile approach may work to differentiate water from vegetable oil, the prompt specifically asks how a student can use food coloring to correctly identify the oil and the water.

Item Set 1 – Question 6 (Inline Choice)

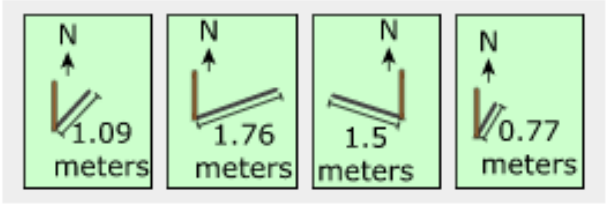


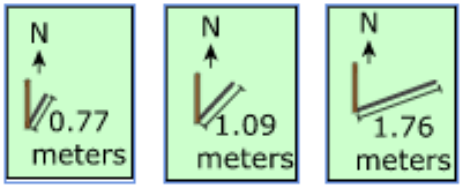
Item Information		
Answer:	See Image	
Grade Level Expectation:	SC.5.3.1	Stars range greatly in size and distance from Earth, and this can explain their relative brightness.
Evidence Outcome:	SC.5.3.1.a	Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from the Earth
Standard:	Earth and Space Science	

Item Set 1 – Question 7 (TEI Drag and Drop)

Outside the path of the total solar eclipse, the pattern of shadows is the same as on any other day. Show how shadows change on the day of the eclipse for someone outside the path of the eclipse.

Based on the data table, drag and drop the correct shadow image into each labeled box. Each shadow may be used once, more than once, or not at all.





Shadow when partial eclipse begins

Shadow during maximum eclipse

Shadow when partial eclipse ends

Item Information		
Answer:	See Image	
Grade Level Expectation:	SC.5.3.2	Earth's orbit and rotation and the orbit of the moon around Earth cause observable patterns.
Evidence Outcome:	SC.5.3.2.a	Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.
Standard:	Earth and Space Science	

Item Set 1 – Question 8 (Selected Response)

The star M45 is visible during the total solar eclipse in the night sky in the Northern Hemisphere. If the same total solar eclipse would occur during the summer, M45 would not be visible. Why would M45 not be visible in the summer?

- A. because M45 changes the amount of light it gives off during different seasons
- B. because M45 moves closer to or farther from planets during different seasons
- C. because Earth revolves around the Sun
- D. because Earth rotates on its axis

Item Information		
Answer:	C	
Grade Level Expectation:	SC.5.3.2	Earth's orbit and rotation and the orbit of the moon around Earth cause observable patterns.
Evidence Outcome:	SC.5.3.2.a	Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.
Standard:	Earth and Space Science	

Item Set 1 – Question 9 (Constructed Response)

After observing the simulation, a student claims that the Sun is the closest star to Earth. Compare the brightness of the objects in the sky during the partial eclipse and the total eclipse to explain why the student's claim is correct. Your response should include:

- a comparison of bright objects seen during the partial solar eclipse and bright objects seen during the total solar eclipse
- an explanation of why the differences in brightness support the student's claim

Item Information		
Answer:	See Sample Student Responses	
Grade Level Expectation:	SC.5.3.1	Stars range greatly in size and distance from Earth, and this can explain their relative brightness.
Evidence Outcome:	SC.5.3.1.a	Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from the Earth
Standard:	Earth and Space Science	

Sample Student Responses *Sample student responses are not representative of all correct answers for an item and are provided only as a guide to assist teachers with scoring.*	
Points	
2	**Sample Response**
	During the partial solar eclipse, only the Sun is visible in the sky, while stars such as Hamal and M45 and planets such as Mercury, Venus, and Jupiter are visible during the total solar eclipse. The brightness of the Sun outshines the other stars during the partial solar eclipse because it is the closest star to Earth.
	Sample Annotation
	The student demonstrates a complete understanding of the task. The comparison of bright objects seen during the partial eclipse to those seen during the total eclipse is correct *(During the partial solar eclipse, only the Sun is visible in the sky, while stars such as Hamal and M45 and planets such as Mercury, Venus, and Jupiter are visible during the total solar eclipse)*. The explanation of why the differences in brightness correctly support the student's claim *(The brightness of the Sun outshines the other stars during the partial solar eclipse because it is the closest star to Earth)*.
1	**Sample Response**
	During a partial eclipse, you can only see the bright sun in the sky. But during a total eclipse, you can see lots of stars like Hamal and M45 and some planets like Venus and Jupiter, because it's so dark, just like at night.
	Sample Annotation
	The response demonstrates a partial understanding of the task. The comparison of bright objects seen during the partial eclipse to those seen during the total eclipse is correct *(During a partial eclipse, you can only see the bright sun in the sky. But during a total eclipse, you can see lots of stars like Hamal and M45 and some planets like Venus and Jupiter)*. The explanation of why the differences in brightness correctly support the student's claim *(because it's so dark, just like at night)* does not mention the sun outshining the stars during the partial eclipse to support the student's claim that the sun is the star closest to earth.

0	**Sample Response**
	During a total solar eclipse, the sky gets very dark, just like at night. It is so dark that you can even see stars in the sky, in the middle of the day.
	Sample Annotation
	This response does not demonstrate an understanding of the task. There is no comparison of bright objects seen during the partial eclipse to those seen during the total eclipse, only a mention that stars are visible during the total solar eclipse. There is no explanation of the differences in brightness to support the student's claim.

Item Set 1 – Question 10 (Constructed Response)

Use the simulation to observe and compare how each star looks during the total solar eclipse. Your response should include:

- how the appearances of the stars compare to each other
- how comparing the stars provides evidence for the distances of stars from Earth

Item Information		
Answer:	See Sample Student Responses	
Grade Level Expectation:	SC.5.3.1	Stars range greatly in size and distance from Earth, and this can explain their relative brightness.
Evidence Outcome:	SC.5.3.1.a	Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from the Earth.
Standard:	Earth and Space Science	

Sample Student Responses *Sample student responses are not representative of all correct answers for an item and are provided only as a guide to assist teachers with scoring.*	
Points	
2	**Sample Response**
	Some stars appear larger and brighter than other stars. Compared to the size of the Sun, the sizes of the other stars appear very small and their apparent brightness is much less. This provides evidence that the other stars are different distances from Earth, though they are all much farther away than the Sun.
	Sample Annotation
	The student demonstrates a complete understanding of the task. The comparison of the appearance of the stars is correct *(Some stars appear larger and brighter than other stars. Compared to the Sun, the sizes of the other stars appear very small and their apparent brightness is much less)*. The explanation of how this comparison gives evidence of the stars' distances from earth is also correct *(the other stars are different distances from Earth, though they are all much farther away than the Sun).*
1	**Sample Response**
	During the total solar eclipse, you can see the stars in the sky. Some look brighter and some look dimmer than the others. And some look bigger and some smaller. But none look as big or as bright as the sun.
	Sample Annotation
	The response demonstrates a partial understanding of the task. The comparison of the appearance of the stars is correct *(Some look brighter and some look dimmer than the others. And some look bigger and some smaller … none look as big or as bright as the sun)*. The response is incomplete because there is no explanation of how the comparison gives evidence of the stars' distances from earth because distance from the earth is not mentioned.

0	**Sample Response**
	The stars and the planets are just little dots of light so that means they are all about the same distance away.
	Sample Annotation
	This response does not demonstrate an understanding of the task. The attempted comparison of the stars is not acceptable because it does not address relative apparent brightness or size. The supposition that the planets and stars are all about the same distance from earth is incorrect.

Item Set 1 – Question 11 (Constructed Response)

A student wonders whether the stars he saw during the total solar eclipse in the simulation would be the same stars he could see twelve hours later. Explain how the sky and the stars that are seen would change over twelve hours. Your response should include:

- a description of how the sky and the stars the student could see would look different
- why the sky would look different

Item Information		
Answer:	See Sample Student Responses	
Grade Level Expectation:	SC.5.3.2	Earth's orbit and rotation and the orbit of the moon around Earth cause observable patterns.
Evidence Outcome:	SC.5.3.2.a	Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.
Standard:	Earth and Space Science	

Sample Student Responses

Sample student responses are not representative of all correct answers for an item and are provided only as a guide to assist teachers with scoring.

Points	
2	**Sample Response**
	The current stars would move across the sky, and different stars will appear twelve hours later. This is because Earth rotates on its axis, so the point of view on Earth would be facing a different part of the sky.
	Sample Annotation
	This response demonstrates a complete understanding of the task. The description of how the sky and stars would look different is correct *(The current stars would move across the sky, and different stars will appear),* and the explanation as to why the sky would look different is correct *(Earth rotates on its axis, so the point of view on Earth would be facing a different part of the sky)*.
1	**Sample Response**
	They would see different stars in 12 hours because the stars move across the sky, like the sun.
	Sample Annotation
	This response demonstrates a partial understanding of the task. The description of how the sky and stars would look different is correct *(because the stars move across the sky, like the sun);* however, there is no mention of the Earth rotating on its axis as the explanation why the sky would look different.
0	**Sample Response**
	It's going to be the same stars because they have been there for millions of years and will be for millions more.
	Sample Annotation
	This response does not demonstrate an understanding of the task. The response is incorrect, as the stars visible behind the sun during the solar eclipse are not visible to that side of Earth at night. The Earth's rotation, which would expose a different part of the sky to a place on Earth over 12 hours, is not mentioned.

Item Set 1 – Question 12 (Selected Response)

Based on the information in Table 1, which claim is supported?

- (●) A. Medium-sized dogs use more energy from the Sun than small-sized dogs use.
- ( ) B. Medium-sized dogs use more energy from water than giant-sized dogs use.
- ( ) C. Large-sized dogs use more energy from the Sun than giant-sized dogs use.
- ( ) D. Large-sized dogs use more energy from water than small-sized dogs use.

Item Information		
Answer:	A	
Grade Level Expectation:	SC.5.1.4	The energy released from food was once energy from the sun.
Evidence Outcome:	SC.5.1.4.a	Use models to describe that energy in animals' food (used for body repair, growth and motion and to maintain body warmth) was once energy from the sun.
Standard:	Life/Physical Science*	

Item Set 1 – Question 13 (TEI Inline Choice)

The student finds that two medium-sized dogs require different amounts of food to maintain a healthy weight. Dog 1 requires 1,050 kcal/day, and Dog 2 requires 900 kcal/day.

Based on Figure 1, compare the energy use of the dogs. Select one correct response from each drop-down menu to complete the sentences.

Dog 1 consumes more kilocalories per day than Dog 2. The energy Dog 1 consumes from the food [originally came from the Sun] . Dog 1 is most likely [younger] than Dog 2.

Item Information		
Answer:	See Image	
Grade Level Expectation:	SC.5.1.4	The energy released from food was once energy from the sun.
Evidence Outcome:	SC.5.1.4.a	Use models to describe that energy in animals' food (used for body repair, growth and motion and to maintain body warmth) was once energy from the sun.
Standard:	Life/Physical Science*	

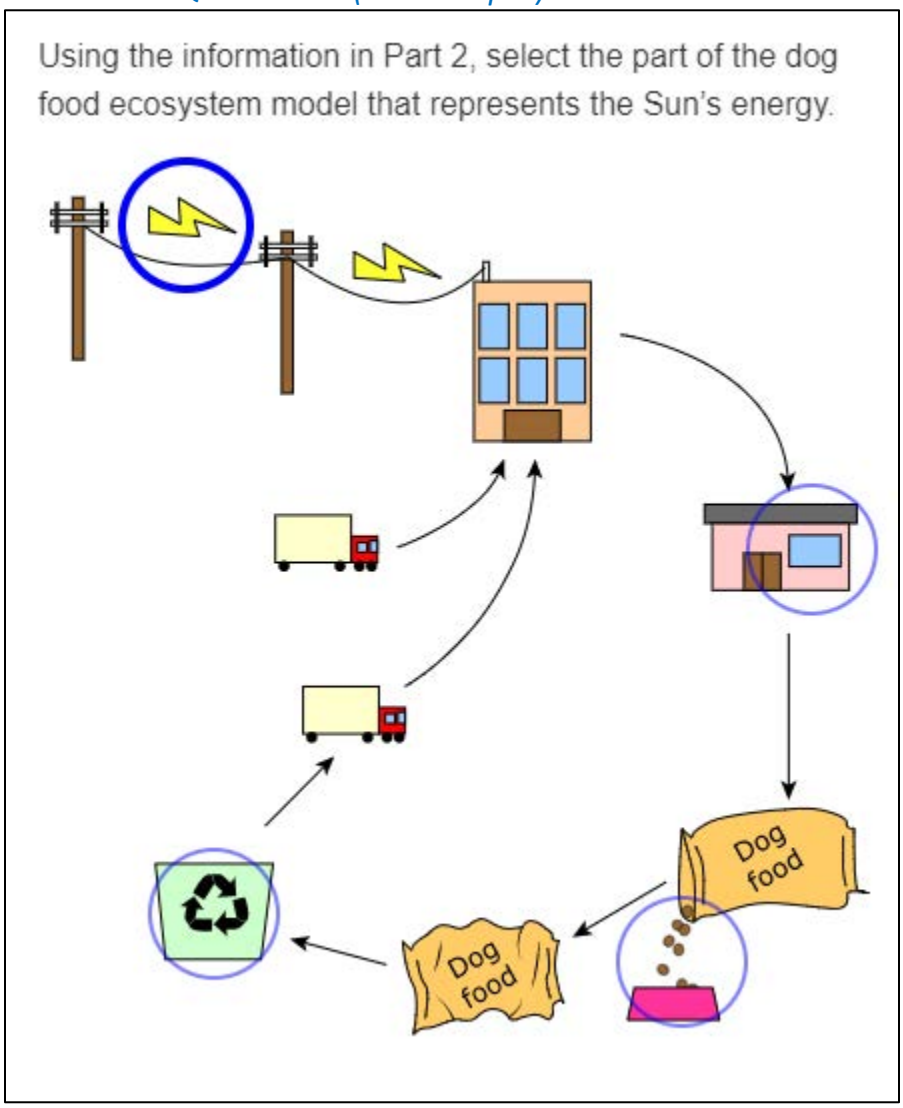
Item Set 1 – Question 14 (Selected Response)

Which statement is one way the model in Part 2 shows matter moving in an ecosystem?

- A. The truck moving ingredients from the farm is like decomposed matter moving from soil to plants.
- B. The truck moving recycled materials is like decomposed matter moving from soil to plants.
- C. The truck moving ingredients from the farm is like energy traveling from the Sun to plants.
- D. The truck moving recycled materials is like energy traveling from the Sun to plants.

Item Information		
Answer:	B	
Grade Level Expectation:	SC.5.2.2	Matter cycles between air and soil and among plants, animals and microbes as these organisms live and die.
Evidence Outcome:	SC.5.2.2.a	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
Standard:	Life/Physical Science*	

Item Set 1 – Question 15 (TEI Hot Spot)



Item Information		
Answer:	See Image	
Grade Level Expectation:	SC.5.1.4	The energy released from food was once energy from the sun.
Evidence Outcome:	SC.5.1.4.a	Use models to describe that energy in animals' food (used for body repair, growth and motion and to maintain body warmth) was once energy from the sun.
Standard:	Life/Physical Science*	

Item Set 1 – Question 16 (Constructed Response)

Using the information in Part 2, explain decomposition in the ecosystem model. Your response should include:

- which part of the ecosystem model represents decomposers
- an explanation of why this part of the model represents decomposers

Item Information		
Answer:	See Sample Student Responses	
Grade Level Expectation:	SC.5.2.2	Matter cycles between air and soil and among plants, animals and microbes as these organisms live and die.
Evidence Outcome:	SC.5.2.2.a	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
Standard:	Life/Physical Science*	

Sample Student Responses *Sample student responses are not representative of all correct answers for an item and are provided only as a guide to assist teachers with scoring.*	
Points	
2	**Sample Response**
	In the ecosystem model, the recycling program represents the decomposers. The recycling program and the decomposers both take waste materials and break them down to be reused.
	Sample Annotation
	This response demonstrates a complete understanding of the task. The student identifies which part of the ecosystem model represents decomposers (*the recycling program*) and explains why (*both take waste materials and break them down to be reused*).
1	**Sample Response**
	Recycling is like decomposition.
	Sample Annotation
	This response demonstrates a partial understanding of the task by correctly identifying which part of the ecosystem represents decomposers (*Recycling*).
0	**Sample Response**
	The food that comes from the farm that is used to make new food.
	Sample Annotation
	This response does not demonstrate an understanding of the task. The part of the ecosystem model which represents decomposers is not identified, and there is no explanation why any part of the model represents decomposers.

Item Set 1 – Question 17 (Constructed Response)

A student wants to see where seeds grow best. The student puts seven seeds in each of three cups and places the cups near an open window. The seeds in Cup A are left to dry. The seeds in Cup B are in dry soil, and the seeds in Cup C are wrapped in a cloth soaked with water.

Cup A, dry seeds

Cup B, seeds put in dry soil

Cup C, seeds wrapped in a cloth soaked in water

Explain what the student will observe after four days. Your answer should include:

- the changes observed in each cup after four days
- the reason for the changes observed in each cup

Item Information		
Answer:	See Sample Student Responses	
Grade Level Expectation:	SC.5.2.1	Plants acquire their material from growth chiefly from air and water.
Evidence Outcome:	SC.5.2.1.a	Support an argument that plants get the materials they need for growth chiefly from air and water.
Standard:	Life/Physical Science*	

Sample Student Responses *Sample student responses are not representative of all correct answers for an item and are provided only as a guide to assist teachers with scoring.*	
Points	
2	**Sample Response**
	The seeds in Cup A and Cup B will show no change, but the seeds in Cup C will have roots growing out of them after four days. The seeds in cups A and B will not show any change because they did not get water and air to grow. The seeds in Cup C got water from the wet cloth and air from the surroundings and would start to grow.
	Sample Annotation
	This response demonstrates a complete understanding of the task. The student explains the changes observed in each cup (*Cup A and Cup B will show no change, but the seeds in Cup C will have roots growing out of them after four days*) and the reason for the changes observed (*The seeds in Cup C got water from the wet cloth and air from the surroundings*).

1	**Sample Response**
	Cup A no growth Cup B no growth Cup C grows
	Sample Annotation
	This response demonstrates a partial understanding of the task. The student correctly states the observations for each cup after 4 days.
0	**Sample Response**
	Cup B and Cup C will grow
	Sample Annotation
	This response does not demonstrate an understanding of the task. No reasons for the changes or lack of changes are given, and an incorrect proposed observation is given for Cup B.

*Refer to the "Grade 5 Science: Colorado Academic Standards 2020 Frameworks" document for an explanation of the Life/Physical Science category.