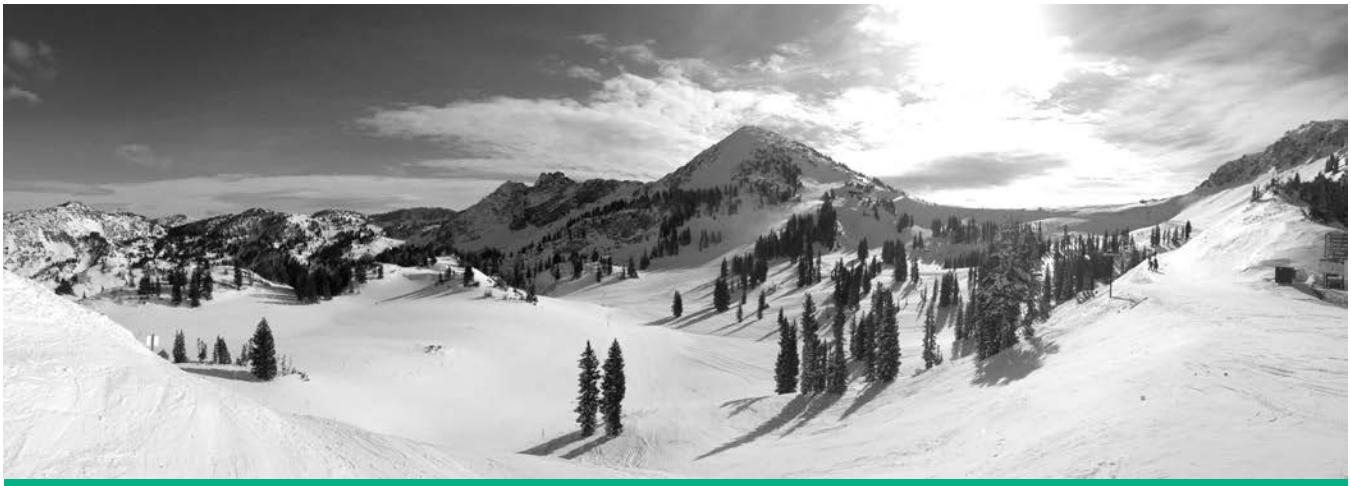
Colorado Measures of Academic Success



Grade 8 Science

Answer Key with Scoring Rubrics

Practice Resource for Students

1139068 1 2 3 4 5 A B C D E Printed in the USA ISD36175

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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 (Selected Response)

Curtains in theaters prevent sound waves from being reflected as echoes. Which model best explains why curtains prevent echoes?

- ○ A. A ball thrown toward a surface will come in contact faster with a soft surface than with a hard surface.
- ○ B. A ball thrown at a surface will hit with a greater force on a soft surface than on a hard surface.
- ○ C. A ball rolled across a surface will roll more quickly on a hard surface than on a soft surface.
- ◉ D. A ball dropped on a surface will bounce more on a hard surface than on a soft surface.

Item Information		
Answer:	D	
Grade Level Expectation:	SC.MS.1.8	A simple wave model has a repeating pattern with specific wavelength, frequency, and amplitude and mechanical waves need a medium through which they are transmitted. This model can explain many phenomena which include light and sound.
Evidence Outcome:	SC.MS.1.8.b	Develop and use a model to describe that waves are reflected, absorbed or transmitted through various materials.
Standard:	Physical Science	

Item Set 1 – Question 2 (TEI Inline Choice)

In the scenario described in Part 1, the student pushes down on the globe and lets it go. Then the globe returns to its original stable position.

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

After the globe is let go, it will return to a stable position when the [magnetic] force equals the [gravitational] force.

Item Information		
Answer:	See Image	
Grade Level Expectation:	SC.MS.1.3	Motion is described relative to a reference frame that must be shared with others and is determined by the sum of the forces acting on it. The greater the mass of the object, the greater the force needed to achieve the same change in motion.
Evidence Outcome:	SC.MS.1.3.b	Plan an investigation to provide evidence that the change in an objects motion depends on the sum of the forces on the object and the mass of the object.
Standard:	Physical Science	

Item Set 1 – Question 3 (TEI Inline Choice)

The student completed the ring magnet investigation to help explain the interaction between the two sets of magnets described in Part 2.

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

The investigation was designed to show that [magnetic fields] exist between the upper and lower sets of magnets. The results provide evidence that the magnets exert forces on each other because the upper magnet set [does not touch] the lower set when it is dropped.

Item Information		
Answer:	See Image	
Grade Level Expectation:	SC.MS.1.4	Forces that act a distance (gravitational, electric, and magnetic) can be explained by force fields that extend through space and can be mapped by their effect on a test object.
Evidence Outcome:	SC.MS.1.4.c	Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.
Standard:	Physical Science	

Item Set 1 – Question 4 (TEI Inline Choice)

The data from the investigation in Part 2 show that the final height of three magnets dropped is lower than when one magnet or two magnets are dropped.

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

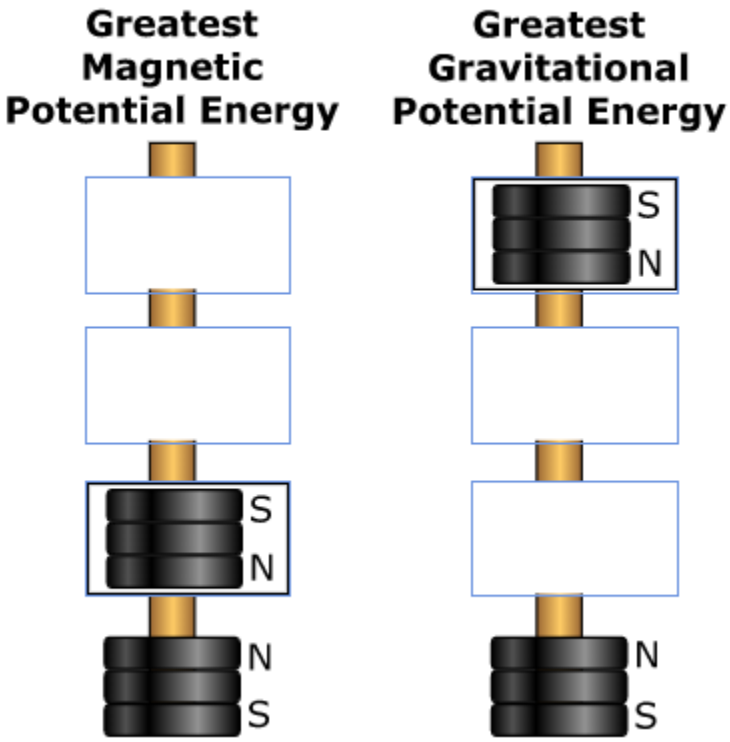
The purpose of the investigation is to show that even when downward force is increased, the magnets continue to [push each other away] . This shows that there is a field coming from [both sets of magnets] .

Item Information		
Answer:	See Image	
Grade Level Expectation:	SC.MS.1.4	Forces that act a distance (gravitational, electric, and magnetic) can be explained by force fields that extend through space and can be mapped by their effect on a test object.
Evidence Outcome:	SC.MS.1.4.c	Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.
Standard:	Physical Science	

Item Set 1 – Question 5 (TEI Drag and Drop)

The sets of magnets described in the investigation in Part 2 demonstrate two kinds of potential energy, magnetic and gravitational. Based on the investigation, show where each kind of potential energy is greatest. The north (N) pole and south (S) pole of each magnet set are specified.

Drag and drop a set of magnets to show the location of the greatest amount of each kind of potential energy. Drag only one set of magnets to the location for the greatest amount of magnetic potential energy, and drag another set to the location for the greatest amount of gravitational potential energy. Fill only one box for each type of potential energy.



Item Information		
Answer:	See Image	
Grade Level Expectation:	SC.MS.1.5	Kinetic energy can be distinguished from the various forms of potential energy.
Evidence Outcome:	SC.MS.1.5.b	Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.
Standard:	Physical Science	

Item Set 1 – Question 6 (Constructed Response)

In the scenario described in Part 1, the student plans to change the setup by adding mass to make the globe heavier. Explain what effect the additional mass will have on the globe. Your response should include:

- an explanation of the changed position of the heavier globe
- a description of two different forces acting on the heavier globe

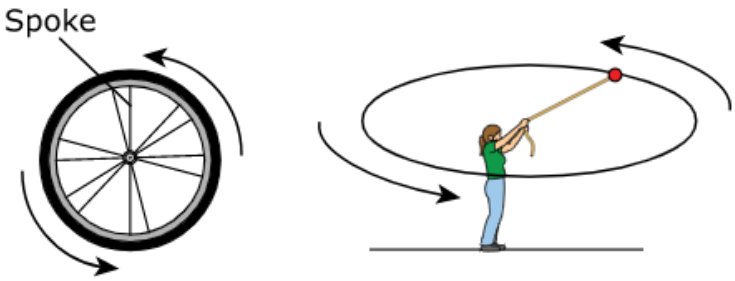
Item Information		
Answer:	See Sample Student Responses	
Grade Level Expectation:	SC.MS.1.3	Motion is described relative to a reference frame that must be shared with others and is determined by the sum of the forces acting on it. The greater the mass of the object, the greater the force needed to achieve the same change in motion.
Evidence Outcome:	SC.MS.1.3.b	Plan an investigation to provide evidence that the change in an objects motion depends on the sum of the forces on the object and the mass of the object.
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**
	Mass added to the globe will cause the globe to drop closer to the base. The gravitational force increases when the mass is greater. This brings the globe closer to the base, but the repulsive force of the magnetic base increases when the distance decreases.
	Sample Annotation
	This response demonstrates a complete understanding of the task. The student describes both forces acting on the globe (*The gravitational force increases when the mass is greater … but the repulsive force of the magnetic base increases when the distance decreases*) and explains the changed position of the heavier globe (*closer to the base*).
1	**Sample Response**
	If it is heavier, it will be lower than it was before because of its weight and gravity.
	Sample Annotation
	This response demonstrates a partial understanding of the task. The student does not describe the forces acting on the globe but does correctly explain the changed position of the heavier globe (*it will be lower than it was before*).
0	**Sample Response**
	The mass will make it heavier.
	Sample Annotation
	The response does not demonstrate an understanding of the task. There is no description of forces acting on the globe and no explanation of the changed position of the heavier globe.

Item Set 1 – Question 7 (TEI Inline Choice)

A student wants to demonstrate the movement of the planets shown in Part 1.

The student will use one of two different models. On the wheel, the spokes are permanently attached to the center, and the wheel stays round. The person spinning the ball on the string has to continue applying force to the string and ball to keep the ball moving in a circular path.



Spinning wheel

Spinning a ball on a string

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

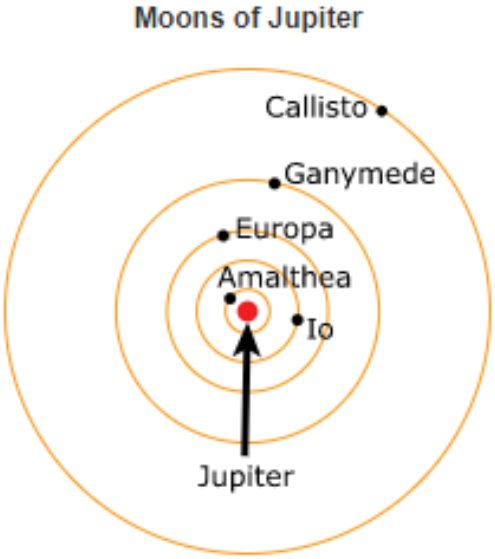
A planet stays in orbit because the Sun's [gravitational force ▾]

acts like a [string that is used to swing a ball ▾] in a circle.

Item Information		
Answer:	See Image	
Grade Level Expectation:	SC.MS.3.2	The solar system contains many varied objects held together by gravity. Solar system models explain and predict eclipses, lunar phases, and seasons.
Evidence Outcome:	SC.MS.3.2.a	Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
Standard:	Earth and Space Science	

Item Set 1 – Question 8 (TEI Inline Choice)

Use the Moons of Jupiter diagram shown, the planetary movement in Part 1, and the table in Part 2 to answer this question.



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

The moon Io travels [faster] than Europa because the gravitational force is stronger between Jupiter and moons that are [closer to] the planet.

Item Information		
Answer:	See Image	
Grade Level Expectation:	SC.MS.3.2	The solar system contains many varied objects held together by gravity. Solar system models explain and predict eclipses, lunar phases, and seasons.
Evidence Outcome:	SC.MS.3.2.a	Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
Standard:	Earth and Space Science	

Item Set 1 – Question 9 (TEI Inline Choice)

A student wants to compare the distance between orbital paths of each planet shown using the scale along the bottom in Part 3.

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

The distance between the orbital paths of Earth and [Jupiter] is almost the same as the distance between the orbital paths of [Jupiter and Saturn]. This shows the orbital radius increases by a [greater and greater] amount for each of the outer planets.

Item Information		
Answer:	See Image	
Grade Level Expectation:	SC.MS.3.2	The solar system contains many varied objects held together by gravity. Solar system models explain and predict eclipses, lunar phases, and seasons.
Evidence Outcome:	SC.MS.3.2.b	Analyze and interpret data to determine scale properties of objects in the solar system.
Standard:	Earth and Space Science	

Item Set 1 – Question 10 (Constructed Response)

Explain how the planetary motion shown in the simulation in Part 1 and described in the table in Part 2 can be used to describe the effects of gravity on the motions of the solar system, and why designers had to consider the entire system of planets when planning Voyager 2's path. Your response should include explanations of:

- how the simulation models the effect of gravity on planetary motions over time given the planets' locations in the solar system
- why understanding planetary motion was needed to plan Voyager 2's path

Item Information		
Answer:	See Sample Student Responses	
Grade Level Expectation:	SC.MS.3.2	The solar system contains many varied objects held together by gravity. Solar system models explain and predict eclipses, lunar phases, and seasons.
Evidence Outcome:	SC.MS.3.2.a	Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
Standard:	Earth and Space Science	

Sample Student Responses

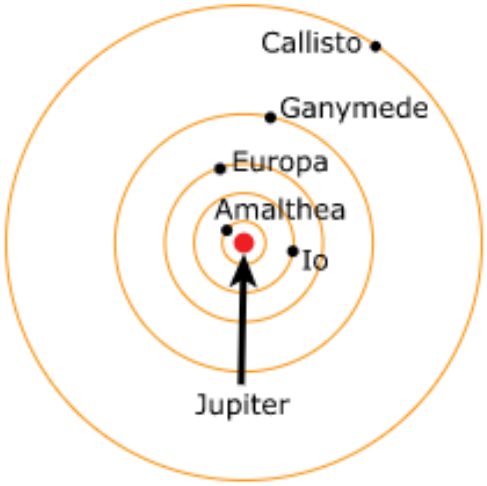
Sample student responses are not representative of all correct answers for an item and are provided only as a guide to assist teachers with scoring.

Points	
2	**Sample Response** The planets that are closer to the Sun move faster than planets that are farther away, showing that the gravitational force between the planets and the Sun is much stronger with closer planets. The designers needed to know each planet's movements to design a path to make sure Voyager 2 would fly close enough to observe the planets. **Sample Annotation** The response demonstrates a complete understanding of the task. The explanation of how the simulation models the effect of gravity on planetary motions over time is correct *(The planets that are closer to the Sun move faster than planets that are farther away, showing that the gravitational force between planets and the Sun is much stronger with closer planets)*, and the explanation of the necessity to understand planetary motion to plan Voyager 2's path is correct *(needed to know each planet's movements to design a path to make sure Voyager 2 would fly close enough to observe)*.
1	**Sample Response** The closer planets have more gravitational force than the farther away ones, so they move faster. The farther away planets move slower because of less force. Voyager started on earth and followed a curving path to visit the other planets. **Sample Annotation** The response demonstrates a partial understanding of the task. The explanation of how gravitational force affects planetary motion is correct *(The closer planets have more gravitational force than the farther away ones, so they move faster);* the inverse statement that is also given would also earn credit for the first bullet point on its own *(The farther away planets move slower because of less force)*. The attempted explanation of the necessity to understand planetary motion to plan Voyager 2's path only describes the shape of the path and does not answer the question *(followed a curving path to visit the other planets)*.
0	**Sample Response** The smaller the planet, the faster it goes. Earth is small, compared to Jupiter, and it goes much faster. **Sample Annotation** This response does not demonstrate an understanding of the task. The explanation of how gravitational force affects planetary motion is incorrect, the speed of the planets in orbit is related mainly to their proximity to the sun due to gravitational forces, not to their sizes. The effect of the varying masses of the planets is negligible compared to the much larger mass of the sun.

Item Set 1 - Question 11 (Constructed Response)

Study the Moons of Jupiter diagram, which shows Jupiter and the orbital paths of its moons.

Moons of Jupiter



Compare the Sun and planets system in Part 3 with the Jupiter and moons system shown in the diagram. Your response should include:

- a comparison of how the two systems are similar
- an explanation of the role of gravity in both systems

Item Information		
Answer:	See Sample Student Responses	
Grade Level Expectation:	SC.MS.3.2	The solar system contains many varied objects held together by gravity. Solar system models explain and predict eclipses, lunar phases, and seasons.
Evidence Outcome:	SC.MS.3.2.a	Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
Standard:	Earth and Space Science	

Item Set 1 - Question 11 (Constructed Response) – Continued

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 Sun is at the center of the solar system, while the planets are revolving around it in their orbits. Similarly, Jupiter is at the center of its system, while its moons are revolving around it in their own orbits. The gravitational force of the Sun makes its planets revolve around it, while the gravitational force of Jupiter makes its moons revolve around it.
	Sample Annotation
	The student demonstrates a complete understanding of the task. The response compares how the systems are similar, noting that the Sun and Jupiter are at the centers of their respective systems *(The Sun is at the center of the solar system, while the planets are revolving around it in their orbits. Similarly, Jupiter is at the center of its system, while its moons are revolving around it in their own orbits).* The response also explains the role of gravity in both systems *(The gravitational force of the Sun makes its planets revolve around it, while the gravitational force of Jupiter makes its moons revolve around it).* [Student may also mention that the Sun is very large or massive compared to the planets, and that Jupiter is very large or massive compared to its moons.]
1	**Sample Response**
	Part 3 shows the Sun and planets and the Jupiter diagram shows Jupiter and its moons. Without the gravitational forces of the Sun and Jupiter, the planets and moons would just go flying off into space.
	Sample Annotation
	The response demonstrates a partial understanding of the task. The comparison is too general because it does not indicate that both systems have satellites orbiting a larger central body, the Sun in one and Jupiter in the other *(Part 3 shows the Sun and planets and the Jupiter diagram shows Jupiter and its moons).* The explanation of the role of gravitational forces, even though it is stated in the negative, is correct and complete *(Without the gravitational forces of the Sun and Jupiter, the planets and moons would just go flying off into space).*
0	**Sample Response**
	Both of the diagrams have things in the center with circles going around them. Gravity keeps us on the ground so we don't go floating off into space.
	Sample Annotation
	This response does not demonstrate an understanding of the task. The comparison is a description of the diagrams only, not what is represented in the diagrams *(things in the center with circles going around them).* The statement about gravity addresses the role of gravity on Earth *(Gravity keeps us on the ground)* not the role of gravitational forces causing the planets to orbit the Sun or the moons to orbit Jupiter.

Item Set 1 - Question 12 (Constructed Response)

Use the AU scale across the bottom of Part 3 to compare the relative distances of the different planets' orbits from one another. With this information, identify three planets where the distance between the orbits of the first two planets is almost the same distance between the orbits of the second and third planets. Your response should include:

- the distances between orbits of the **three** particular planets from the simulation
- an explanation of how evidence from Part 3 supports your selection of those planets

Item Information		
Answer:	See Sample Student Responses	
Grade Level Expectation:	SC.MS.3.2	The solar system contains many varied objects held together by gravity. Solar system models explain and predict eclipses, lunar phases, and seasons.
Evidence Outcome:	SC.MS.3.2.b	Analyze and interpret data to determine scale properties of objects in the solar system.
Standard:	Earth and Space Science	

Sample Student Responses

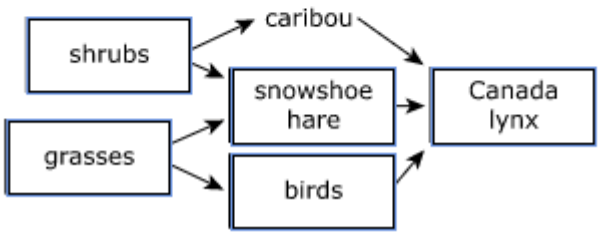
Sample student responses are not representative of all correct answers for an item and are provided only as a guide to assist teachers with scoring.

Points	
2	**Sample Response** The distance between the orbits of Saturn and Uranus and the distance between the orbits of Uranus and Neptune are about the same. The AU scale showing the distance of the planets from the Sun shows that Saturn is 10 AU distant, Uranus is 19 AU distant, and Neptune is 30 AU distant. So the distance between Saturn and Uranus is 9 AU, while the distance from Uranus to Neptune is 11 AU. **Sample Annotation** This response demonstrates a complete understanding of the task. The appropriate distances are given *(the distance between Saturn and Uranus is 9 AU, while the distance from Uranus to Neptune is 11 AU),* and the explanation of evidence from Part 3 is correct *(AU scale … shows that Saturn is 10 AU distant, Uranus is 19 AU distant, and Neptune is 30)*. **Note:** The planets Earth, Jupiter, and Saturn could also be used. The distance between the orbits of Earth and Jupiter is 4 AU; the distance between the orbits of Jupiter and Saturn is 5 AU.
1	**Sample Response** I chose Saturn, Uranus, and Neptune for my planets. Saturn and Uranus look to be just under 10 AU apart and Uranus and Neptune look just over 10 AU apart. **Sample Annotation** This response demonstrates a partial understanding of the task. A group of three acceptable planets have been selected and the approximate distances between their orbits have been given *(Saturn and Uranus look to be just under 10 AU apart and Uranus and Neptune look just over 10 AU apart).* However, there is no use of data from the AU scale in Part 3 to give the total sizes of the planets' orbits, which would justify the distances given *(just under 10 AU apart … just over 10 AU apart)*.
0	**Sample Response** I think Mercury, Venus and Earth are the planets to use. Mercury and Venus are all closer to the Sun than the Earth, so their orbits would be less than 1, so they are closer together than the other planets shown in part 3. **Sample Annotation** This response does not demonstrate an understanding of the task. Two of the three planets chosen do not appear in Part 3 *(Mercury, Venus)*. The determination of orbit size follows correct logic, but since the planets do not appear in Part 3, measurement of their orbits cannot be made, so no credit is given.

Item Set 1 - Question 13 (TEI Drag and Drop)

A student creates a food web for the organisms listed in the table from Part 1. The student learns that caribou eat shrubs, and birds eat grass seeds.

Based on this information, drag the organisms into the boxes to create a model that shows how matter and energy move through this forest ecosystem. Each organism may be used once.



Item Information		
Answer:	See Image	
Grade Level Expectation:	SC.MS.2.6	Ecosystems are sustained by the continuous flow of energy, originating primarily from the sun, and the recycling of matter and nutrients within the system.
Evidence Outcome:	SC.MS.2.6.a	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
Standard:	Life Science	

Item Set 1 - Question 14 (Selected Response)

Based on the information in Part 2, which year in the study was **most likely** associated with a decrease in available energy from plants?

- (●) A. Year 9
- ( ) B. Year 15
- ( ) C. Year 27
- ( ) D. Year 45

Item Information		
Answer:	A	
Grade Level Expectation:	SC.MS.2.5	Organisms and populations of organisms are dependent on their environmental interactions both with other living things and with nonliving factors.
Evidence Outcome:	SC.MS.2.5.a	Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
Standard:	Life Science	

Item Set 1 - Question 15 (Selected Response)

Based on the information in Part 1 and Part 2, which statement **most likely** explains the conditions between Year 15 and Year 20?

- A. A decrease in caribou population in Year 17 led to a decrease in the Canada lynx population and an increase in the snowshoe hare population in Year 20.
- B. A disease slowed the population growth of Canada lynx in Year 17, but the disease did not affect the snowshoe hare population in that same year.
- C. A new predator of snowshoe hares migrated to the area in Year 17, which led to an increase in the Canada lynx population in Year 20.
- D. A severe drought in Year 17 caused a sharp reduction in both the Canada lynx population and the snowshoe hare population.

Item Information		
Answer:	D	
Grade Level Expectation:	SC.MS.2.7	Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all of its populations.
Evidence Outcome:	SC.MS.2.7.a	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
Standard:	Life Science	

Item Set 1 – Question 16 (TEI Inline Choice)

The maps in Part 3 show the ranges for the Canada lynx and the snowshoe hare. The scientists collected data on sightings of these animals during the study. They observed that the Canada lynx traveled outside their normal range at certain times.

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

Based on the information in Part 1 and Part 2, the **most likely** year during the study when Canada lynx were observed outside their range is [Year 30 ▾]

because the main food source for the Canada lynx was [less abundant ▾]

during this year.

Item Information		
Answer:	See Image	
Grade Level Expectation:	SC.MS.2.5	Organisms and populations of organisms are dependent on their environmental interactions both with other living things and with nonliving factors.
Evidence Outcome:	SC.MS.2.5.b	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
Standard:	Life Science	

Item Set 1 - Question 17 (Constructed Response)

A disease that affects snowshoe hares may also have an effect on the ecosystem. Based on the information in Part 1, explain how a disease affecting the snowshoe hare population would affect the overall ecosystem. Your response should include:

- how the disease would cause a decrease in population of some organisms in the ecosystem
- how the disease would cause an increase in population of other organisms in the ecosystem

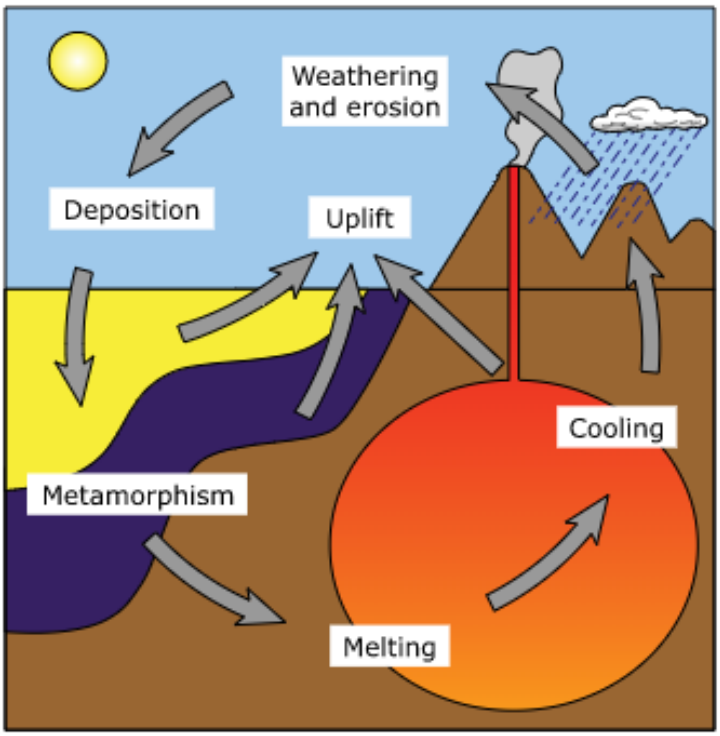
Item Information		
Answer:	See Sample Student Responses	
Grade Level Expectation:	SC.MS.2.5	Organisms and populations of organisms are dependent on their environmental interactions both with other living things and with nonliving factors.
Evidence Outcome:	SC.MS.2.5.a	Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
Standard:	Life 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**
	Fewer snowshoe hares would cause a decrease in the number of birds because the Canada lynx would need to increase the amount of other food sources to replace their main source of prey. A decrease in snowshoe hares would cause an increase in the grasses because the grasses are one of the snowshoe hare's main food sources.
	Sample Annotation
	This response demonstrates a complete understanding of the task. The student correctly describes how a population would decrease (*a decrease in the number of birds because the Canada lynx would need to increase the amount of other food sources*) and how a population would increase (*an increase in the grasses because the grasses are one of the snowshoe hare's main food sources*).
1	**Sample Response**
	The lynx population would increase because they would start catching caribou and caribou are way bigger than hares. The hare eats plants with soft stems and grass so if the hare is not there to eat them because it died of a disease there would be more of those.
	Sample Annotation
	This response demonstrates a partial understanding of the task. The student correctly describes how a population would increase (*The hare eats plants with soft stems and grass so if the hare is not there to eat them because it died of a disease there would be more of those*). However, the student provides flawed logic about the connection between the lynx and the caribou populations and does not attempt to explain a decrease in any of the populations.
0	**Sample Response**
	The lynx eats the hare.
	Sample Annotation
	This response does not demonstrate an understanding of the task. No population increase or decrease is described.

Item Set 1 - Question 18 (Selected Response)

This model shows interactions in one of Earth's systems.

The Rock Cycle



How does energy from the Sun affect this cycle?

- A. It causes heating of water that results in weathering and erosion.
- B. It causes heating of rocks that results in metamorphism.
- C. It causes heating of Earth that results in melting.
- D. It causes heating of the air that results in uplift.

Item Information		
Answer:	A	
Grade Level Expectation:	SC.MS.3.4	Energy flows and matter cycles within and among Earth's systems, including the sun and Earth's interior as primary energy sources. Plate tectonics is one result of these processes.
Evidence Outcome:	SC.MS.3.4.a	Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.
Standard:	Earth and Space Science	