Grade 5 Science Practice Test Answer Key

This document contains the answer keys, rubrics, and Scoring Notes for items on the Grade 5 Science Practice Test. Additional Practice Test resources are available in the LDOE Practice Test Library.

Session	Set	Sequence	Item Type	Key	Point Value	Alignment
1	Rafflesia	1	TEI	See Rubric	2	PE: 5-LS2-1 SEP: 2. Developing and using models DCI: UE.LS2B.a CCC: Systems and System Models
1		2	MC	D	1	PE: 5-LS1-1 SEP: 1. Asking questions (for science) and defining problems (for engineering) DCI: UE.LS1C.b
1		3	TEI	See Rubric	1	PE: 5-LS2-1 DCI: UE.LS2A.a CCC: Energy and Matter
1		4	TPI: MC/ MC	C/D	2	PE: 5-LS2-1 DCI: UE.LS2A.d CCC: Systems and System Models
1	Mixing Liquids	5	TEI	See Rubric	1	PE: 5-PS1-2 SEP: 5. Using mathematics and computational thinking DCI: UE.PS1B.b
1		6	TEI	See Rubric	1	PE: 5-PS1-4 SEP: 3. Planning and carrying out investigations DCI: UE.PS1B.a
1		7	TPD: MC/ MC	C/A	2	PE: 5-PS1-4 DCI: UE.PS1B.a CCC: Cause and Effect
1		8	CR	See Rubric	2	PE: 5-PS1-2 *SEP: 3. Planning and carrying out investigations DCI: UE.PS1B.b **The primary SEP is not in the dimension associated with the primary PE. This SEP is from bundled PE 5-PS1-4.*
1	Controlling Runoff	9	TEI	See Rubric	2	PE: 5-ESS2-1 DCI: UE.ESS2A.b CCC: Systems and System Models
1		10	MC	C	1	PE: 5-ESS3-1 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: UE.ESS3C.a
1		11	TEI	See Rubric	1	PE: 5-ESS3-1 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: UE.ESS3C.a CCC: Systems and System Models
1		12	CR	See Rubric	2	PE: 5-ESS3-1 DCI: UE.ESS3C.a CCC: Systems and System Models

Session	Set	Sequence	Item Type	Key	Point Value	Alignment
1	Standalone Items	13	MC	B	1	PE: 5-LS1-1 DCI: UE.LS1C.b CCC: Energy and Matter
1		14	TPD: MC/ MC	D/C	2	PE: 5-PS1-4 DCI: UE.PS1B.a CCC: Cause and Effect
1		15	TEI	See Rubric	2	PE: 5-LS2-1 DCI: UE.LS2B.a CCC: Systems and System Models
2	Brightness and Shadows	16	TPD: TEI/ MC	See Rubric/	2	PE: 5-ESS1-1 DCI: UE.ESS1A.a CCC: Scale, Proportion and Quantity
2		17	MC	B	1	PE: 5-ESS1-1 SEP: 7. Engaging in argument from evidence DCI: UE.ESS1A.a CCC: Scale, Proportion and Quantity
2		18	TEI	See Rubric	2	PE: 5-ESS1-2 SEP: 4. Analyzing and interpreting data DCI: UE.ESS1B.a CCC: Patterns
2		19	MC	C	1	PE: 5-ESS1-2 SEP: 4. Analyzing and interpreting data DCI: UE.ESS1B.a CCC: Patterns
2		20	ER	See Rubric	9	PE: 5-ESS1-1 SEP: 7. Engaging in argument from evidence DCI: UE.ESS1A.a CCC: Scale, Proportion and Quantity
2	Standalone Items	21	TEI	See Rubric	1	PE: 5-ESS1-2 SEP: 4. Analyzing and interpreting data DCI: UE.ESS1B.a CCC: Patterns
2		22	TPD: MC/ MC	C/D	2	PE: 5-PS1-2 SEP: 5. Using mathematics and computational thinking DCI: UE.PS1A.b CCC: Energy and Matter
2		23	TPI: MC/ MC	B/C	2	PE: 5-PS3-1 SEP: 2. Developing and using models DCI: UE.PS3D.b CCC: Energy and Matter
3	Louisiana Black Bears	24	MS	B/D	1	PE: 5-ESS3-1 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: UE.ESS3C.a
3		25	TEI	See Rubric	2	PE: 5-ESS3-1 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: UE.ESS3C.a CCC: Systems and System Models

Session	Set	Sequence	Item Type	Key	Point Value	Alignment
3	Louisiana Black Bears	26	MC	B	1	PE: 5-ESS3-1 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: UE.ESS3C.a
3		27	CR	See Rubric	2	PE: 5-ESS3-1 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: UE.ESS3C.a CCC: Systems and System Models
3	Mineral Identification	28	MC	B	1	PE: 5-PS1-3 SEP: 3. Planning and carrying out investigations DCI: UE.PS1A.c
3		29	TEI	See Rubric	2	PE: 5-PS1-3 SEP: 3. Planning and carrying out investigations DCI: UE.PS1A.c
3		30	MC	B	1	PE: 5-PS1-1 SEP: 3. Planning and carrying out investigations DCI: UE.PS1A.a CCC: Scale, Proportion and Quantity
3		31	TEI	See Rubric	2	PE: 5-PS1-1 DCI: UE.PS1A.c CCC: Scale, Proportion and Quantity
3	Standalone Items	32	MC	A	1	PE: 5-PS1-2 SEP: 5. Using mathematics and computational thinking DCI: UE.PS1A.b CCC: Energy and Matter
3		33	MC	D	1	PE: 5-LS1-1 SEP: 1. Asking questions (for science) and defining problems (for engineering) DCI: UE.LS1C.b
3		34	MC	C	1	PE: 5-ESS2-2 SEP: 5. Using mathematics and computational thinking CCC: Scale, Proportion and Quantity
3		35	MS	B/C	1	PE: 5-PS1-1 SEP: 2. Developing and using models DCI: UE.PS1A.a
3		36	MC	D	1	PE: 5-ESS1-2 SEP: 4. Analyzing and interpreting data DCI: UE.ESS1B.a
3		37	MC	B	1	PE: 5-ESS1-1 SEP: 7. Engaging in argument from evidence DCI: UE.ESS1A.a CCC: Scale, Proportion and Quantity
3		38	MC	C	1	PE: 5-PS3-1 SEP: 2. Developing and using models DCI: UE.PS3D.b CCC: Energy and Matter

Session	Set	Sequence	Item Type	Key	Point Value	Alignment
3	Standalone Items	39	MC	A	1	PE: 5-ESS2-2 SEP: 5. Using mathematics and computational thinking DCI: UE.ESS2C.a
3		40	TPD: MC/ MC	D/C	2	PE: 5-PS2-1 SEP: 7. Engaging in argument from evidence DCI: UE.PS2B.c CCC: Cause and Effect
3		41	TPD: TEI/ TEI	See Rubric	2	PE: 5-PS1-3 SEP: 3. Planning and carrying out investigations DCI: UE.PS1A.c

Item Types and Scoring:

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

  Multiple-select (MS) questions with five to six answer options and more than one correct answer. For MS items, the question identifies the number of correct answers. All MS items are worth one point each.

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

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

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

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

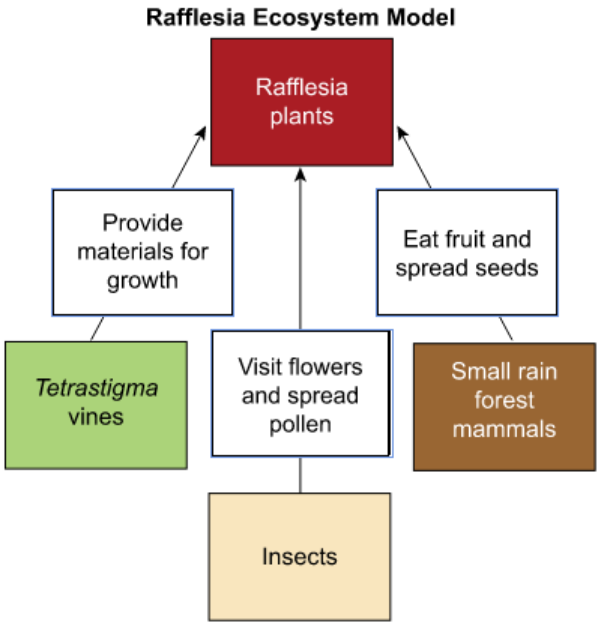
Session 1 Item 1 (TEI)

Rafflesia plants depend on *Tetrastigma* vines, insects, and small rain forest mammals so that they can grow and reproduce.

Drag the answer choice that **best** describes how each plant or animal helps rafflesia into the correct box. Not all answer choices will be used.

Protect against cold temperatures

Provide food from other parts of the rain forest



Scoring Notes:

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

Session 1 Item 3 (TEI)

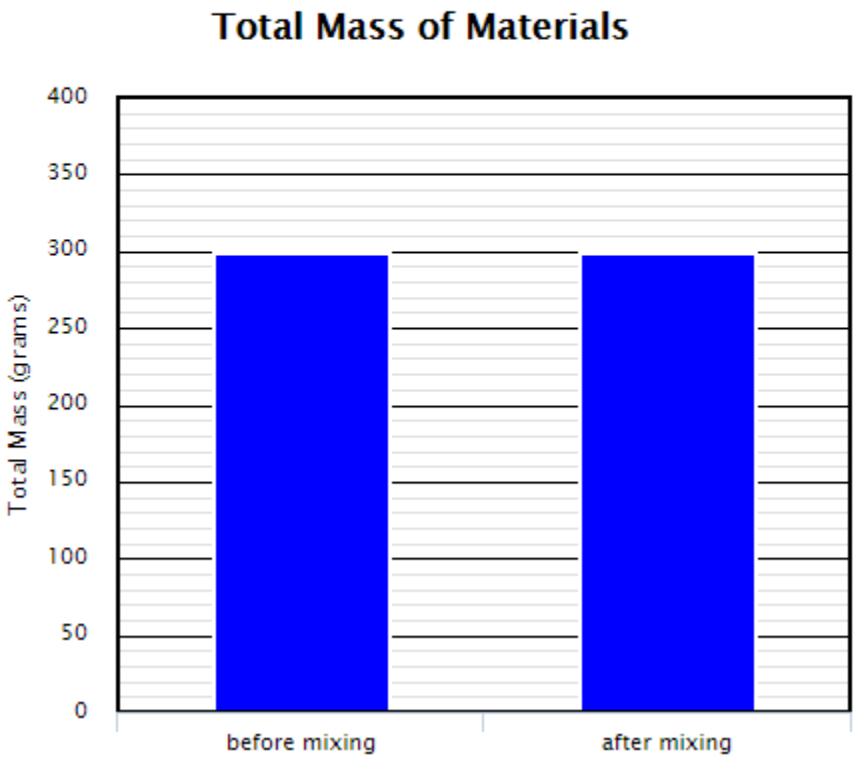
Matter transfers through a rafflesia food web. This food web helps other organisms obtain the nutrients they need in order to grow.

Select the correct answer from **each** drop-down menu to complete the sentence about where these nutrients come from.

The nutrients in a rafflesia food web that small rain forest mammals need in order to grow come from [Tetrastigma vines ▾] because this part of the food web provides [matter to rafflesia plants ▾].

Session 1 Item 5 (TEI)

Predict the mass of the materials after the liquids are mixed. Drag the bars to the correct heights to show the mass of the materials before mixing and the predicted mass of the materials after mixing.



**NOTE: In the Accommodated Form, this item was changed to an MC. In the MC version in the paper form, the correct answer is "A."*

Session 1 Item 6 (TEI)

A student recorded some observations after watching the experiment in the video.

Select the **two** statements that provide evidence that mixing the two liquids produced new substances.

- The flask was sealed with a stopper.
- The total mass of the materials was measured.
- The flask was tilted over so that the liquids were mixed.
- **A white solid formed in the flask.**
- **The liquid changed to a lighter blue.**
- The total mass of the materials was measured again.

Session 1 Item 8 (CR)

Use the information in Figure 2 to answer the question.

Explain why the scientist put a stopper on the flask and measured the total mass of the materials before and after mixing the solutions.

Scoring Information	
Score	**Description**
2	Student's response correctly explains why the scientist put a stopper on the flask AND explains why the scientist measured the mass before and after the experiment.
1	Student's response correctly explains why the scientist put a stopper on the flask OR explains why the scientist measured the mass before and after the experiment.
0	Student's response does not correctly explain why the scientist put a stopper on the flask OR why the scientist measured the mass before and after the experiment. **OR** Student's response is blank, irrelevant, or too brief to evaluate.

Scoring Notes:

- Explanation of why the scientist put a stopper on the flask (1 point)
- Explanation of why the scientist measured the mass before and after the experiment (1 point)

Examples include:

- The scientist put a stopper on the flask to be sure all the materials would stay inside the flask during the experiment, even if a gas was formed. The scientist measured the mass before and after the experiment so that the mass of the original materials could be compared with the mass of the materials that were produced.
- Putting a stopper on the flask keeps all of the materials inside the flask during the experiment. The scientist measured the mass before and after the experiment to determine if there was a change in mass during the reaction.

Accept other reasonable answers.

Session 1 Item 9 (TEI)

A farmer has removed all of the trees and native grasses from her land so she can plant crops. A few years later, there is a serious drought, and the farmer observes a lot of dust in the air during the summer.

Identify the two systems that interact to cause **each** event.

	atmosphere and geosphere	biosphere and geosphere	hydrosphere and biosphere
A drought causes the farmer's crops to die.	○	○	●
Roots from crops stop holding down the soil.	○	●	○
Wind blows away the loose soil.	●	○	○

Scoring Notes:

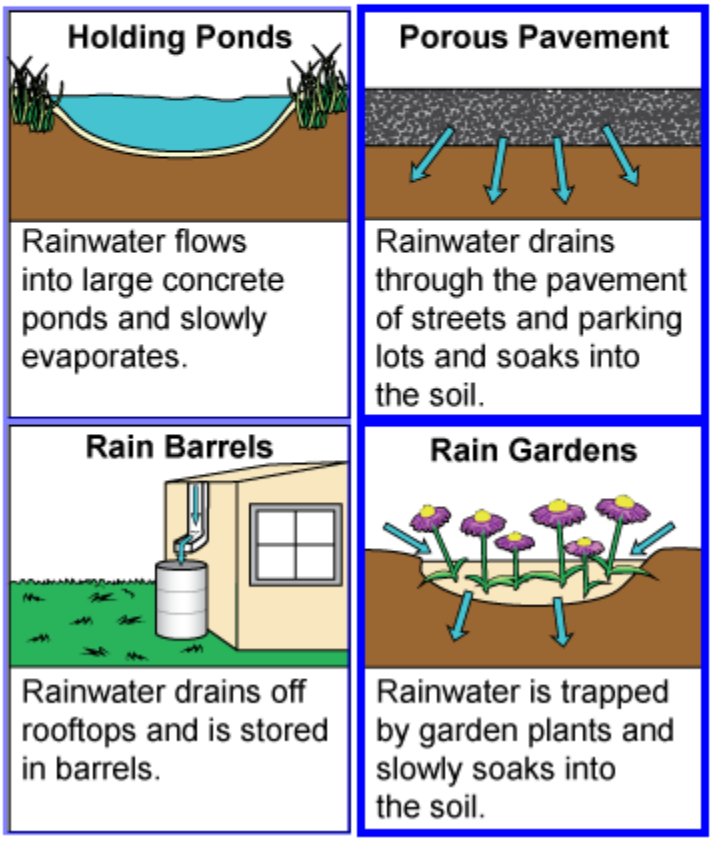
This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 3 correct responses; therefore 1 point will be awarded if the student selects 2 correct responses.

Session 1 Item 11 (TEI)

A city neighborhood has many apartment buildings and very little open land. The neighborhood is evaluating four methods to protect local water resources.

Which methods would **best** help people in a city neighborhood filter runoff before it enters local streams?

Select the **two** correct answers.



Session 1 Item 12 (CR)

Use the information in Figure 2 to answer the question.

Marcia lives in Shreveport, Louisiana, which is almost 200 miles from the ocean. She is concerned that trash from her city may end up in rivers and streams and eventually pollute the ocean.

Explain how trash from Shreveport might end up in rivers and streams and ultimately the ocean. Suggest at least one way trash from Shreveport could be stopped from entering the ocean.

Scoring Information	
Score	**Description**
2	Student's response correctly explains how trash is transported from Shreveport to the ocean AND suggests a reasonable method to prevent trash from being transported from Shreveport to the ocean.
1	Student's response correctly explains how trash is transported from Shreveport to the ocean but does not suggest a reasonable method to prevent trash from being transported from Shreveport to the ocean.
0	Student's response does **not** correctly explain how trash is transported from Shreveport to the ocean or suggest a reasonable method to prevent trash from being transported from Shreveport to the ocean. **OR** Student's response is blank, irrelevant, or too brief to evaluate.

Scoring Notes:

- Explanation of how trash is transported from Shreveport to the ocean (1 point)
- Suggestion of a method to prevent trash from being transported from Shreveport to the ocean (1 point)

Examples include:

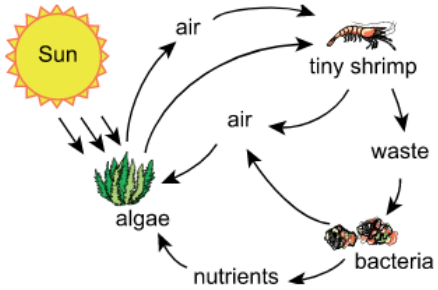
- The trash washes into a street gutter, goes down into the storm sewer, and travels to the river, and the river empties into the ocean. People in Shreveport could put nets or screens across the sewer to catch trash before it reaches the river.
- The trash is washed into a street gutter and then into a river. The river carries the trash to the ocean. People in Shreveport could put more trash cans in public places so there will be less trash on the ground that can be washed into the street gutters.

Accept other reasonable answers.

Session 1 Item 15 (TEI)

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

Sam is developing a model of a simple aquatic ecosystem. Her model is shown in the figure.



Sam wants to add labels to the model to explain how matter moves through the ecosystem. She writes a list of statements about the ecosystem.

Classify each statement. Select the correct boxes.

	Correct statement that describes movement of matter	Correct statement, but does not describe movement of matter	Not a correct statement
The Sun provides matter that helps the algae grow.	○	○	●
Algae gets energy from the Sun.	○	●	○
Shrimp get nutrients from the bacteria.	○	○	●
Bacteria recycle waste materials in the ecosystem.	●	○	○
Algae, bacteria, and shrimp release gases into the ecosystem.	●	○	○

Scoring Notes:

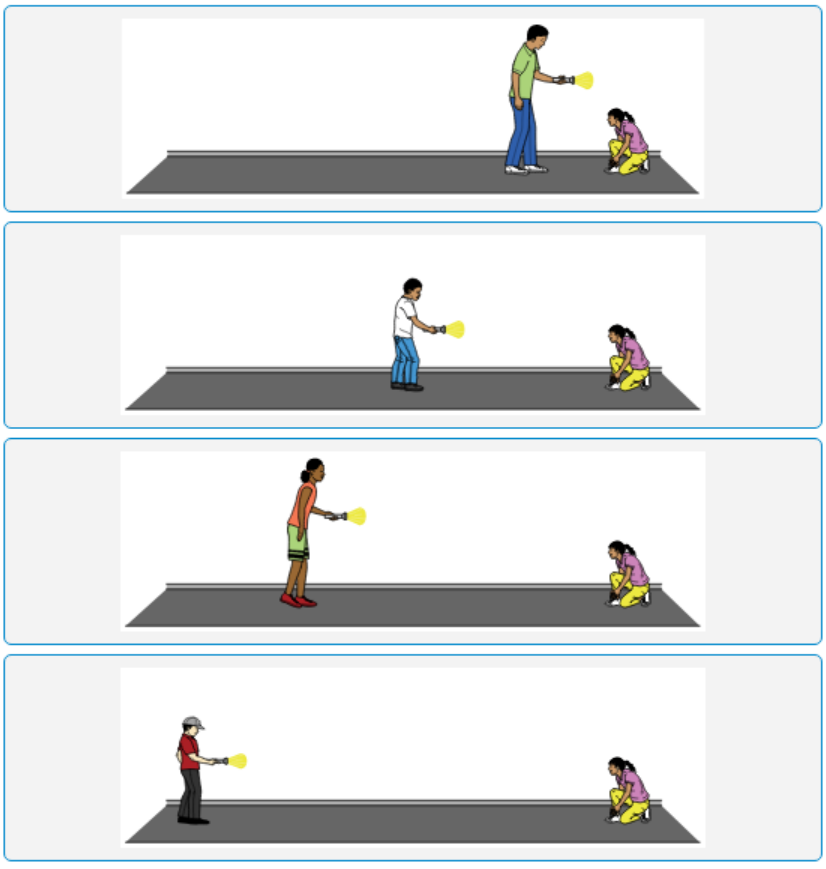
This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 5 correct responses; therefore 1 point will be awarded if the student selects 3 or more correct responses.

Session 2 Item 16 (TPD)

Part A

The teacher has the students stand in a dark hallway with flashlights. Everyone has the same kind of flashlight. One student stops to tie her shoelace. When she looks up, each of her classmates is at a different distance away.

Drag the images in order so that the top image shows the flashlight that will appear brightest and the bottom image shows the one that will appear dimmest.



NOTE: In Accommodated Form, student will write label of Pictures in order: Picture 3, Picture 1, Picture 4, Picture 2.

Session 2 Item 16 (TPD), continued

Part B

Which claim **best** supports the answer to Part A?

A. The light will be brighter when taller people hold the flashlight because the light reflects off the walls and into the student's eyes.

B. The light will be brighter when the flashlight is closer because the light is more focused.

C. The light will be brighter when the flashlight is farther away because the light can spread out.

D. The light will be brighter when shorter people hold the flashlight because the light reflects off the student's clothes and into the student's eyes.

Session 2 Item 18 (TEI)

Use the information in Figure 2 to answer the question.

Students observe that their shadows change appearance during the day.

Select the correct answer from **each** drop-down menu to complete the sentences.

At noon, the students observe that their shadows are [short ▾] because the sunlight is coming from [overhead ▾].

Later, when the students walk home at 3 P.M., their shadows are [longer ▾] because the sunlight is coming from [between the horizon and overhead ▾].

Scoring Notes:

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

Session 2 Item 20 (ER)

Use the information in Figure 1 and Figure 2 to answer the questions.

Part A

Karen notices that she can see the North Star at night, but she cannot see this star during the day.

Explain why Karen can see the North Star only at night. Use evidence from Figure 1 to support your explanation.

Part B

Karen asks her cousins in different cities to help her with an investigation. They all observe the angle of the Sun and the shadow of a meterstick when it is noon in Karen's city. They make these observations:

- Karen sees that the Sun is shining directly overhead.
- Nancy sees that the Sun is shining at a small angle.
- Sheila sees that the Sun is shining at a large angle.
- Taylor sees that the Sun is shining at a small angle.

Predict how the length of the shadow Karen measures will compare with the length of the shadow each of her cousins measures. Use evidence from Figure 2 to support your answer.

Score Points

- The student's score is the sum total of all the points earned across all parts (up to an item-maximum of 9 points) of the item.
- The student's score is 0 if the response is blank, incorrect, or does not address the prompt.

Session 2 Item 20 (ER), continued

PART A (0-3 points maximum)

- 3 points for a prediction with explanation that uses evidence
  - Score 3 points: Correct explanation that uses distance between the stars and evidence from the model to support the answer

  OR

  - Score 2 points: Correct explanation that uses distance between the stars to support the answer, but does not use the model as evidence

  OR

  - Score 1 point: Correct explanation without reasoning or evidence

PART B (0-6 points maximum)

- 2 points for each comparison with evidence (for a total of THREE comparisons)
  - Score 2 points: Each correct comparison that uses evidence from the model to support the answer

  OR

  - Score 1 point: Each correct comparison without evidence to support the answer

Score Information

PART A: Student explains why the North Star cannot be seen during the day. (3 pts for a correct explanation with reasoning and evidence from the model; 2 pts for a correct explanation with reasoning, but no evidence from the model; 1 pt for a correct explanation without reasoning or evidence)

1. Explanation about why Karen cannot see the North Star during the day:

- The North Star is not as bright as the Sun, so the sunlight keeps Karen from seeing the North Star when the Sun is shining.

2. Reasoning to support the explanation:

- The North Star is much farther away from Earth than the Sun, so it is not as bright as the Sun.

Session 2 Item 20 (ER), continued

3. Evidence from the model to support the explanation:

- The model shows that closer lights appear brighter.

Part B: Student compares the lengths of shadows for a meterstick between Karen and her three cousins. (2 pts each with evidence from the model; 1 pt each without evidence)

1. Karen will measure a shorter shadow than Nancy:

- Karen's meterstick shadow will be very short, but Nancy's meterstick shadow will be a little longer.
- This is because the angle of the sunlight is at a small angle for Nancy, like in Trial 2 of the model, but directly overhead for Karen, like in Trial 1 of the model. The shadow in Trial 2 is longer than in Trial 1.

2. Karen will measure a shorter shadow than Sheila:

- Sheila's meterstick shadow will be long, but Karen's meterstick shadow will be very short.
- This is because the angle of the sunlight will be directly overhead for Karen, like in Trial 1 of the model, but a bigger angle for Sheila, like in Trial 3 of the model. The shadows in Trial 1 are shorter than in Trial 3.

3. Karen will measure a shorter shadow than Taylor:

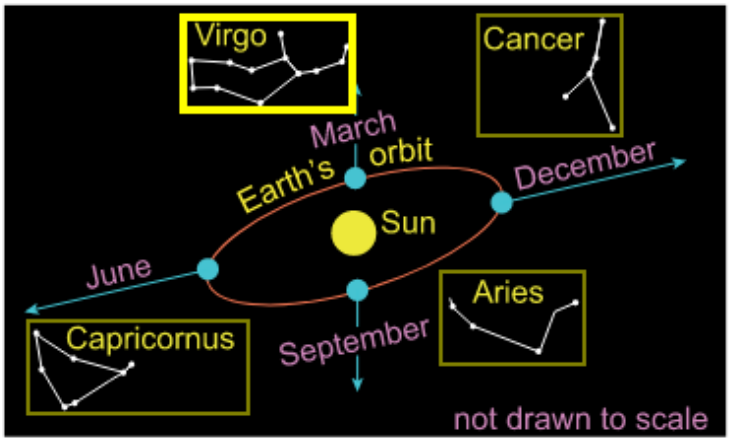
- Karen's meterstick shadow will be very short, but Taylor's meterstick shadow will be a little longer.
- This is because the angle of the sunlight is at a small angle for Taylor, like in Trial 2 of the model, but directly overhead for Karen, like in Trial 1 of the model. The shadow in Trial 2 is longer than in Trial 1.

Session 2 Item 21 (TEI)

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

Observers on Earth see different star constellations depending on the time of year. The arrows on the diagram point to the part of the sky that is visible overhead for observers on Earth at different times of the year.

Select the constellation on the star diagram that will **most likely** be visible in April.



Session 3 Item 25 (TEI)

Bears form a system with their habitats and other animals that live in their habitats.

Select the correct answer from **each** drop-down menu to complete the statements.

Building new cities requires removing the habitat that was already there. Since the trees and animals in the habitat are gone, bears will not be able to [find enough food ▾].

As a result, the bears must find new [food sources ▾]. This causes bears to interact with humans more often. This is dangerous for bears because bears might [be hit by cars ▾].

Scoring Notes:

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

Session 3 Item 27 (CR)

Select two parts of the plan described in the passage and explain how each part leads to an increase in the bear population.

Scoring Information	
Score	**Description**
2	Student's response correctly explains how two parts of the plan lead to an increase in the bear population.
1	Student's response correctly explains how one part of the plan leads to an increase in the bear population but not how a second part of the plan leads to an increase in the bear population.
0	Student's response does not explain how two parts of the plan lead to an increase in the bear population. **OR** Student's response is blank, irrelevant, or too brief to evaluate.

Scoring Notes:

- Explanation of how one part of the plan leads to an increase in the bear population (1 point)
- Explanation of how a second part of the plan leads to an increase in the bear population (1 point)

Examples include:

- Using education to reduce bear deaths on roads will help reduce bear deaths by getting hit by cars. If more bears survive, then there will be more bears to reproduce, so that the population will increase.
- Connecting areas where bears live so that they can travel farther will allow bears to find more food so that they can survive. If more bears survive and reproduce, the population will increase.

Accept other reasonable answers.

Session 3 Item 29 (TEI)

Use the information in Table 1 to answer the question.

A scientist finds an unknown mineral that might be mineral Y. She decides to do several tests and compare her results with characteristics of mineral Y.

Identify which characteristic can be determined using **each** test.

	the types of chemicals that make up the mineral	the strength of the connections between particles in the mineral
pour some vinegar over a small piece of the mineral	●	○
slowly add mass on top of a small piece of the mineral	○	●
place a small piece of the mineral in a beaker of water	●	○
use a rock hammer to carefully break pieces off the mineral	○	●

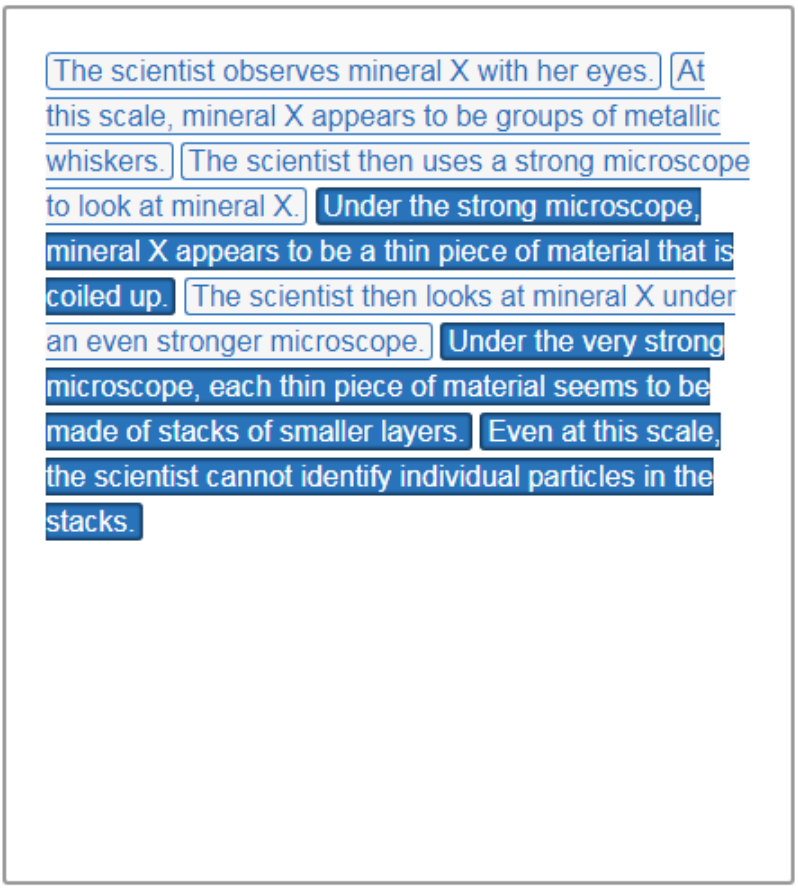
Scoring Notes:

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

Session 3 Item 31 (TEI)

Unlike the other two minerals in the table, mineral X does not have tiny pieces that appear to be separated from each other.

Select the **three** statements that best explain that mineral X is made of particles that are too small to see.



Scoring Notes:

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

Session 3 Item 41 (TPD)

Part A

A group of students observed several properties of five different materials.

Select the material that is **most likely** a metal.

Material	Reflects Light?	Attracted to a Magnet?	Can Bend into Different Shapes?	Conducts Heat?
A	yes	no	no	no
B	yes	no	yes	no
C	yes	no	yes	yes
D	yes	yes	yes	yes
E	yes	yes	yes	no

Part B

Select the correct answer from **each** drop-down menu to support the answer to Part A.

Since metals always [conduct heat ▾], this means that the material most likely to be a metal has this property. Since very few non-metal objects [are attracted to a magnet ▾], an object that has this property is probably a metal.