

This document contains the answer keys, rubrics, and Scoring Notes for items on the Grade 4 Science Practice Test. Additional Practice Test resources are available in the LDOE [Practice Test Library](#).

**UPDATES INCLUDED - AUGUST 2021**

- **Student Responses with Annotations - Session 1 Item 8 (CR)**
- **Session 1 Item 12 (CR)**

Session	Set	Sequence	Item Type	Key	Point Value	Alignment
1	Hawaiian Volcanoes	1	MC	B	1	PE: 4-ESS2-2 SEP: 4. Analyzing and interpreting data DCI: UE.ESS2B.a CCC: Patterns
1		2	MC	C	1	PE: 4-ESS2-2 DCI: UE.ESS2B.a CCC: Patterns
1		3	TPD: MC/ MC	A/D	2	PE: 4-ESS2-2 SEP: 4. Analyzing and interpreting data DCI: UE.ESS2B.a CCC: Patterns
1		4	TPI: MC/ MC	A/D	2	PE: 4-ESS3-2 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: UE.ESS3B.a
1	Heating with Solar Energy	5	MC	D	1	PE: 4-PS3-4 DCI: UE.PS3D.a CCC: Energy and Matter
1		6	MC	C	1	PE: 4-ESS3-1 SEP: 8. Obtaining, evaluating, and communicating information DCI: UE.ESS3A.a
1		7	TPD: MC/ MC	D/B	2	PE: 4-PS3-4 DCI: UE.PS3A.b CCC: Energy and Matter
1		8	CR	See Rubric	2	PE: 4-ESS3-1 SEP: 8. Obtaining, evaluating, and communicating information DCI: UE.ESS3A.a
1	Marble Experiment	9	MC	D	1	PE: 4-PS3-1 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: UE.PS3A.a
1		10	MC	C	1	PE: 4-PS3-1 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) CCC: Energy and Matter

Session	Set	Sequence	Item Type	Key	Point Value	Alignment
1	Marble Experiment	11	TPD: MC/ MC	B/C	2	PE: 4-PS3-3 SEP: 1. Asking questions (for science) and defining problems (for engineering) DCI: UE.PS3B.a CCC: Energy and Matter
1		12	CR	See Rubric	2	PE: 4-PS3-3 *SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: UE.PS3C.a CCC: Energy and Matter <i>*The primary SEP is not in the dimension associated with the primary PE. This SEP is bundled from PE 4-PS3-1.</i>
1	Standalone Items	13	MC	B	1	PE: 4-LS1-2 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: UE.LS1D.a
1		14	MC	C	1	PE: 4-ESS3-2 DCI: UE.ESS3B.a CCC: Cause and Effect
1		15	TPD: MC/ MC	B/B	2	PE: 4-ESS2-2 SEP: 4. Analyzing and interpreting data DCI: UE.ESS2B.a CCC: Patterns
2	Beavers	16	TPD: MC/ MS	D/ A, B	2	PE: 4-ESS2-3 SEP: 1. Asking questions (for science) and defining problems (for engineering) DCI: UE.ESS2E.a CCC: Systems and System Models
2		17	TPD: MC/ MC	D/C	2	PE: 4-LS1-1 SEP: 7. Engaging in argument from evidence DCI: UE.LS1A.a CCC: Cause and Effect
2		18	MS	A, C	1	PE: 4-LS1-1 DCI: UE.LS1A.a CCC: Systems and System Models
2		19	MC	D	1	PE: 4-ESS2-3 DCI: UE.ESS2E.a CCC: Cause and Effect
2		20	ER	See Rubric	6	PE: 4-ESS2-3 SEP: 1. Asking questions (for science) and defining problems (for engineering) DCI: UE.ESS2E.a CCC: Cause and Effect
2		21	MC	C	1	PE: 4-LS1-1 SEP: 7. Engaging in argument from evidence CCC: Systems and System Models

Session	Set	Sequence	Item Type	Key	Point Value	Alignment
2	Standalone Items	22	MC	A	1	PE: 4-PS3-4 DCI: UE.PS3B.c CCC: Energy and Matter
2		23	TPD: MC/ MC	D/C	2	PE: 4-PS3-4 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: UE.ETS1C.a
3	Predator and Prey Senses	24	MC	D	1	PE: 4-LS1-2 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: UE.LS1D.a
3		25	MS	A, D	1	PE: 4-PS4-2 SEP: 2. Developing and using models DCI: UE.PS4B.a
3		26	TPI: MC/ MC	C, B	2	PE: 4-LS1-2 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: UE.LS1D.a CCC: Cause and Effect
3		27	CR	See Rubric	2	PE: 4-LS1-2 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: UE.LS1D.a
3		28	MC	A	1	PE: 4-PS3-3 DCI: UE.PS3B.a CCC: Energy and Matter
3	Striking Flint	29	TPD: MC/ MC	A/C	2	PE: 4-PS3-2 DCI: UE.PS3A.b CCC: Energy and Matter
3		30	MC	B	1	PE: 4-PS3-3 DCI: UE.PS3B.a CCC: Energy and Matter
3		31	TPD: MC/ MS	B/ B, E	2	PE: 4-PS3-3 SEP: 1. Asking questions (for science) and defining problems (for engineering) DCI: UE.PS3A.b CCC: Energy and Matter
3	Standalone Items	32	MC	D	1	PE: 4-ESS1-1 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: UE.ESS1C.a CCC: Patterns

Session	Set	Sequence	Item Type	Key	Point Value	Alignment
3	Standalone Items	33	MC	D	1	PE: 4-ESS2-1 SEP: 3. Planning and carrying out investigations DCI: UE.ESS2A.a CCC: Cause and Effect
3		34	MC	A	1	PE: 4-ESS2-2 SEP: 4. Analyzing and interpreting data DCI: UE.ESS2B.a CCC: Patterns
3		35	MC	C	1	PE: 4-PS4-1 SEP: 2. Developing and using models CCC: Patterns
3		36	MC	B	1	PE: 4-PS4-1 SEP: 2. Developing and using models DCI: UE.PS4A.b CCC: Patterns
3		37	MC	C	1	PE: 4-ESS2-3 SEP: 1. Asking questions (for science) and defining problems (for engineering) DCI: UE.ESS2E.a CCC: Cause and Effect
3		38	MS	A, E	1	PE: 4-ESS3-1 SEP: 8. Obtaining, evaluating, and communicating information DCI: UE.ESS3A.a
3		39	MC	D	1	PE: 4-PS3-1 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: UE.PS3A.a CCC: Energy and Matter
3		40	MS	B, E	1	PE: 4-PS4-2 SEP: 2. Developing and using models DCI: UE.PS4B.a CCC: Cause and Effect
3		41	TPD: MC/ MS	B/ B, C	2	PE: 4-ESS1-1 SEP: 6. Constructing explanations (for science) and designing solutions (for engineering) DCI: UE.ESS1C.a CCC: Patterns

### 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 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.

- Two-part Items: require students to answer two related questions, worth a total of two points. Two-part items may combine MC and MS 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 6-point rubric.

**Session 1 Item 8 (CR)**

Use the information in Table 1 to answer the question.

A family wants to use a renewable source of energy for heat in the winter. The family lives on a ranch in a windy area with very few hours of sunlight in the winter and a lot of sunlight in the summer. Identify which energy source would work **best** for the family and explain your selection.

Scoring Information	
Score	Description
2	Student's response correctly identifies which energy source would work best for the family AND explains their selection.
1	Student's response identifies which energy source would work best for the family, but does not explain their selection.
0	Student's response does <b>not</b> correctly identify which energy source would work best for the family or explain their selection. <b>OR</b> Student's response is blank, irrelevant, or too brief to evaluate.

**Scoring Notes:**

- Identification of the best energy source (1 point)
- Explanation of the selection (1 point)

**Examples include:**

- The family should use wind as their energy source. Since there is not much sunlight in the winter, wind would be a better energy source.
- The family does not have much sunlight in the winter, so solar energy would not provide enough power in the winter. The family should use wind, since there is wind energy all year long.

Accept other reasonable answers.

**Student Responses for Session 1 Item 8 (CR)**

Use the information in Table 1 to answer the question.

A family wants to use a renewable source of energy for heat in the winter. The family lives on a ranch in a windy area with very few hours of sunlight in the winter and a lot of sunlight in the summer. Identify which energy source would work **best** for the family and explain your selection.

**Response 1**

The energy source that would work best for the family is wind. Wind would work best for the family because they are getting ready for winter and winter has very little sunlight but summer has a lot of sunlight and in both seasons the wind blows.

**Score: 2**

This response earns a 2. It correctly identifies which energy source would work best for the family, “Wind would work best for the family.” It also accurately explains their selection, “winter has very little sunlight but summer has a lot of sunlight and in both seasons the wind blows.”

**Response 2**

If the family wants a renewable source they should go with wind because they get a lot of wind.

**Score: 2**

This response earns a 2. It correctly identifies which energy source would work best for the family, “they should go with wind.” It also accurately explains their selection, “because they get a lot of wind.”

**Response 3**

The best energy source the family will need is wind power because if they get to hot they could use the wind power.

**Score: 1**

This response earns a 1. It correctly identifies which energy source would work best for the family, “The best energy source the family will need is wind power.” It does not accurately explain that the area is windy or does not receive enough sunlight year round, “because if they get to hot they could use the wind power.”

**Response 4**

I think the solar energy source would work best. I think the solar energy source would work best because is renewable like they wanted. The energy is produced when the sun shines. The impact on the environment has large land use to the environment.

**Score: 0**

This response earns a 0. It does not correctly identify which energy source would work best for the family, “I think the solar energy source would work best.” The response does not identify the correct energy source, and therefore, does not receive credit for the explanation to their selection.



**Session 1 Item 12 (CR)**

Describe the transfer of energy that occurs when the marble hits the cup. Be sure to use evidence from the experiment in your explanation.

<b>Scoring Information</b>	
<b>Score</b>	<b>Description</b>
<b>2</b>	Student’s response correctly describes the transfer of energy that occurs when the marble hits the cup AND is supported with evidence from the experiment.
<b>1</b>	Student’s response correctly describes the transfer of energy that occurs when the marble hits the cup, but is not supported with evidence from the experiment.
<b>0</b>	Student’s response does <b>not</b> correctly describe the transfer of energy that occurs when the marble hits the cup and is not supported with evidence from the experiment. <b>OR</b> Student’s response is blank, irrelevant, or too brief to evaluate.

**Scoring Notes:**

- Description of transfer of energy (1 point)
- Evidence from the experiment (1 point)

**Examples Include:**

- Motion energy is transferred from the marble to the cup during the collision. The motion energy of the cup allows the cup to move. Evidence of the transfer of energy is shown by the cup moving during the experiment.
- In the collision, the marble transfers motion energy to the cup. Evidence for this transfer is that the marble slows down and the cup begins to move.

Accept other reasonable answers.

**Student Responses for Session 1 Item 12 (CR)**

Describe the transfer of energy that occurs when the marble hits the cup. Be sure to use evidence from the experiment in your explanation.

**Response 1**

At top of the ramp the marble has potential energy because gravity could pull it down the ramp and when it started going it had kinetic energy. it was moving. when it hits the cup the marble transfers the energy to the cup witch makes the cup move and the marble slow down.

**Score: 2**

This response earns a 2. It correctly describes the transfer of energy when the marble hits the cup, “when the marble hits the cup it transfers the energy to the cup.” The response is also accurately supported with evidence from the experiment, “witch makes the cup move and the marble slow down.”

**Response 2**

The changes of the energy when the marble hit te cup was the marble gave the cupe energy and made he cup go out

**Score: 2**

This response earns a 2. It correctly describes the transfer of energy when the marble hits the cup, “the marble gave the cupe energy.” The response is also accurately supported with evidence from the experiment, “made he cup go out.”

**Response 3**

the changes of energy was when the ramp gets taller and the farther it goes down the faster it goes and when it hits the cup it transfer energy to the cup

**Score: 1**

This response earns a 1. It correctly describes the transfer of energy when the marble hits the cup, “when it hits the cup it transfer energy to the cup.” The response is not supported with evidence from the experiment.

**Response 4**

When the marble hits the cup the speed will decrease the cup will slow down the marble.

**Score: 0**

This response earns a 0. It incorrectly describes the transfer of energy when the marble hits the cup, “the speed will decrease.” The response does not correctly describe the transfer of energy when the marble hits the cup, and therefore, does not receive credit for evidence from the experiment.

**Session 2 Item 20 (ER)**

Beavers make changes that harm farmland.

Make a claim about a problem that beavers may cause for a farmer. In your response, be sure to:

- use evidence to support your claim
- explain at least two ways that the problem can be solved

**Score Points**

- The student’s score is the sum total of all the points earned (up to a maximum of 6 points) in the item.
- The student’s score is 0 if the response is blank, incorrect, or does not address the prompt.
- 2 points maximum for a claim supported by evidence:
  - Score 2 points: Reasonable claim with evidence to support the claim
  - OR**
  - Score 1 point: Reasonable claim with no evidence to support the claim
- 2 points for each solution with explanation; each solution must include an explanation to receive a point (for a total of TWO solutions)
  - Score 2 points: Each solution with explanation
  - OR**
  - Score 1 point: Each solution without explanation

**Score Information**

Student makes a claim about a problem a beaver can cause for the farmer and uses evidence to support the claim; student proposes two solutions to the problem.

*1. Beavers can cause problems for farmers:*

- Beavers build dams that block streams. This can cause flooding of farm land near the dam because water cannot flow downstream.
- Beavers kill crops to build dams. This removes food sources for humans.

NOTE: Accept any other plausible claim about a problem caused for farmers by beaver activities.

***Session 2 Item 20 (ER), continued***

*2. Problems caused for farmers by beavers can be solved by humans:*

- Humans can build levees to prevent flooding.
- Humans can relocate beavers to an area that will not be affected by the dams.
- Humans can hunt beavers so there are not too many beavers in an area.
- Humans can plant more crops so there is enough food.

NOTE: Accept any other plausible solution to the problem the student described.

**Session 3 Item 27 (CR)**

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

Some dog breeds hunt rabbits by sight. The rabbits see the dogs before the dogs get close to them. When the rabbits realize there is danger, they start running. The dogs chase after the moving rabbits.

Explain how the location of an animal's eyes helps the animal survive. In your response, be sure to explain:

- how eyes facing forward help dogs easily see and follow the moving rabbits
- how eyes on the sides of their heads help rabbits see the dogs before the dogs get close to them

<b>Scoring Information</b>	
<b>Score</b>	<b>Description</b>
<b>2</b>	Student's response correctly explains how eyes facing forward helps dogs easily see and follow the rabbit <b>AND</b> explains how eyes on the sides of their heads help rabbits see the dogs before the dogs get close to them.
<b>1</b>	Student's response correctly explains how eyes facing forward helps dogs easily see and follow the rabbit <b>OR</b> explains how eyes on the sides of their heads help rabbits see the dogs before the dogs get close to them.
<b>0</b>	Student's response does <b>not</b> correctly explain how eyes facing forward helps dogs easily see and follow the rabbit or explain how eyes on the sides of their heads help rabbits see the dogs before the dogs get close to them <b>OR</b> Student's response is blank, irrelevant, or too brief to evaluate.

**Scoring Notes:**

- Explanation of why dogs can see and follow the rabbits (1 point)
- Explanation of why rabbits can see the dogs before the dogs get close to the rabbits (1 point)

***Session 3 Item 27 (CR), continued***

**Examples include:**

- Dogs cannot see in all directions but are able to follow the rabbits because their eyes are on the front of their heads, which lets them see clearly in front of them. Rabbits are able to see in all directions because their eyes are on the sides of their heads.
- Dogs have eyes in the front of their heads. The locations of their eyes let dogs see clearly ahead of them to follow the rabbits. Rabbits have eyes on the sides of their heads. The locations of their eyes let rabbits see in all directions and notice the dogs.
- Dogs have a small area they can see, but see clearly in front of them, so they are able to see and follow the rabbits they are chasing. Rabbits have a big area that they can see, so they are able to see dogs from any direction.

Accept other reasonable answers.