

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](#).

| Session | Set                       | Sequence | Item Type         | Key        | Point Value | Alignment   |
|---------|---------------------------|----------|-------------------|------------|-------------|---|
| 1       | Hawaiian Volcanoes        | 1        | MC                | B          | 1           | PE: 4-ESS2-2<br>SEP: 4. Analyzing and interpreting data<br>DCI: UE.ESS2B.a<br>CCC: Patterns   |
| 1       |                           | 2        | MC                | C          | 1           | PE: 4-ESS2-2<br>DCI: UE.ESS2B.a<br>CCC: Patterns  |
| 1       |                           | 3        | TPD:<br>MC/<br>MC | A/D        | 2           | PE: 4-ESS2-2<br>SEP: 4. Analyzing and interpreting data<br>DCI: UE.ESS2B.a<br>CCC: Patterns   |
| 1       |                           | 4        | TPI:<br>MC/<br>MC | A/D        | 2           | PE: 4-ESS3-2<br>SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)<br>DCI: UE.ESS3B.a              |
| 1       | Heating with Solar Energy | 5        | MC                | D          | 1           | PE: 4-PS3-4<br>DCI: UE.PS3D.a<br>CCC: Energy and Matter   |
| 1       |                           | 6        | MC                | C          | 1           | PE: 4-ESS3-1<br>SEP: 8. Obtaining, evaluating, and communicating information<br>DCI: UE.ESS3A.a   |
| 1       |                           | 7        | TPD:<br>MC/<br>MC | D/B        | 2           | PE: 4-PS3-4<br>DCI: UE.PS3A.b<br>CCC: Energy and Matter   |
| 1       |                           | 8        | CR                | See Rubric | 2           | PE: 4-ESS3-1<br>SEP: 8. Obtaining, evaluating, and communicating information<br>DCI: UE.ESS3A.a   |
| 1       | Marble Experiment         | 9        | MC                | D          | 1           | PE: 4-PS3-1<br>SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)<br>DCI: UE.PS3A.a                |
| 1       |                           | 10       | MC                | C          | 1           | PE: 4-PS3-1<br>SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)<br>CCC: Energy and Matter        |
| 1       |                           | 11       | TPD:<br>MC/<br>MC | B/C        | 2           | PE: 4-PS3-3<br>SEP: 1. Asking questions (for science) and defining problems (for engineering)<br>DCI: UE.PS3B.a<br>CCC: Energy and Matter |

| Session | Set               | Sequence | Item Type         | Key        | Point Value | Alignment   |
|---------|-------------------|----------|-------------------|------------|-------------|---|
| 1       | Marble Experiment | 12       | CR                | See Rubric | 2           | PE: 4-PS3-3<br>*SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)<br>DCI: UE.PS3C.a<br>CCC: Energy and Matter<br><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<br>SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)<br>DCI: UE.LS1D.a  |
| 1       |                   | 14       | MC                | C          | 1           | PE: 4-ESS3-2<br>DCI: UE.ESS3B.a<br>CCC: Cause and Effect  |
| 1       |                   | 15       | TPD:<br>MC/<br>MC | B/B        | 2           | PE: 4-ESS2-2<br>SEP: 4. Analyzing and interpreting data<br>DCI: UE.ESS2B.a<br>CCC: Patterns   |
| 2       | Beavers           | 16       | TPD:<br>MC/<br>MS | D/<br>A, B | 2           | PE: 4-ESS2-3<br>SEP: 1. Asking questions (for science) and defining problems (for engineering)<br>DCI: UE.ESS2E.a<br>CCC: Systems and System Models   |
| 2       |                   | 17       | TPD:<br>MC/<br>MC | D/C        | 2           | PE: 4-LS1-1<br>SEP: 7. Engaging in argument from evidence<br>DCI: UE.LS1A.a<br>CCC: Cause and Effect  |
| 2       |                   | 18       | MS                | A, C       | 1           | PE: 4-LS1-1<br>DCI: UE.LS1A.a<br>CCC: Systems and System Models   |
| 2       |                   | 19       | MC                | D          | 1           | PE: 4-ESS2-3<br>DCI: UE.ESS2E.a<br>CCC: Cause and Effect  |
| 2       |                   | 20       | ER                | See Rubric | 6           | PE: 4-ESS2-3<br>SEP: 1. Asking questions (for science) and defining problems (for engineering)<br>DCI: UE.ESS2E.a<br>CCC: Cause and Effect  |
| 2       | Standalone Items  | 21       | MC                | C          | 1           | PE: 4-LS1-1<br>SEP: 7. Engaging in argument from evidence<br>CCC: Systems and System Models   |
| 2       |                   | 22       | MC                | A          | 1           | PE: 4-PS3-4<br>DCI: UE.PS3B.c<br>CCC: Energy and Matter   |

| Session | Set                      | Sequence | Item Type         | Key        | Point Value | Alignment   |
|---------|--------------------------|----------|-------------------|------------|-------------|---|
| 2       | Standalone Items         | 23       | TPD:<br>MC/<br>MC | D/C        | 2           | PE: 4-PS3-4<br>SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)<br>DCI: UE.ETS1C.a                         |
| 3       | Predator and Prey Senses | 24       | MC                | D          | 1           | PE: 4-LS1-2<br>SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)<br>DCI: UE.LS1D.a                          |
| 3       |                          | 25       | MS                | A, D       | 1           | PE: 4-PS4-2<br>SEP: 2. Developing and using models<br>DCI: UE.PS4B.a  |
| 3       |                          | 26       | TPI:<br>MC/<br>MC | C, B       | 2           | PE: 4-LS1-2<br>SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)<br>DCI: UE.LS1D.a<br>CCC: Cause and Effect |
| 3       |                          | 27       | CR                | See Rubric | 2           | PE: 4-LS1-2<br>SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)<br>DCI: UE.LS1D.a                          |
| 3       |                          | 28       | MC                | A          | 1           | PE: 4-PS3-3<br>DCI: UE.PS3B.a<br>CCC: Energy and Matter   |
| 3       | Striking Flint           | 29       | TPD:<br>MC/<br>MC | A/C        | 2           | PE: 4-PS3-2<br>DCI: UE.PS3A.b<br>CCC: Energy and Matter   |
| 3       |                          | 30       | MC                | B          | 1           | PE: 4-PS3-3<br>DCI: UE.PS3B.a<br>CCC: Energy and Matter   |
| 3       |                          | 31       | TPD:<br>MC/<br>MS | B/<br>B, E | 2           | PE: 4-PS3-3<br>SEP: 1. Asking questions (for science) and defining problems (for engineering)<br>DCI: UE.PS3A.b<br>CCC: Energy and Matter           |
| 3       | Standalone Items         | 32       | MC                | D          | 1           | PE: 4-ESS1-1<br>SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)<br>DCI: UE.ESS1C.a<br>CCC: Patterns       |
| 3       |                          | 33       | MC                | D          | 1           | PE: 4-ESS2-1<br>SEP: 3. Planning and carrying out investigations<br>DCI: UE.ESS2A.a<br>CCC: Cause and Effect  |

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

**Session 1 Item 12 (CR)**

Describe the changes in energy that occur when the marble hits the cup. Be sure to use evidence from the experiment in your explanation.

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

**Scoring Notes:**

- Description of changes in 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. This 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.

### 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 why dogs are able to hunt by sight. In your response, be sure to explain:

- why the rabbits see the dogs before the dogs get close to the rabbits
- why the dogs can easily see and follow the moving rabbits

| Scoring Information |   |
|---------------------|---|
| Score               | Description   |
| 2                   | Student's response correctly explains why the rabbits see the dogs before the dogs get close to the rabbits AND explains why the dogs can easily see and follow the moving rabbits.   |
| 1                   | Student's response correctly explains why the rabbits see the dogs before the dogs get close to the rabbits OR explains why the dogs can easily see and follow the moving rabbits.  |
| 0                   | Student's response does <b>not</b> correctly explain why the rabbits see the dogs before the dogs get close to the rabbits or explain why the dogs can easily see and follow the moving rabbits.<br><b>OR</b><br>Student's response is blank, irrelevant, or too brief to evaluate. |

**Scoring Notes:**

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

**Examples include:**

- Rabbits are able to see in all directions because their eyes are on the sides of their heads. 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 have eyes on the sides of their heads, but dogs have eyes in the front of their heads. The locations of their eyes let rabbits see in all directions and notice the dogs. The locations of their eyes let dogs see clearly ahead of them to follow the rabbits.

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

- Rabbits have a big area that they can see, so they are able to see dogs from any direction. Dogs have a smaller area they can see, but see clearly in front of them, so they are able to see and follow the rabbits they are chasing.

Accept other reasonable answers.