cognia

NMASR NEW MEXICO ASSESSMENT OF SCIENCE READINESS

*2019–2020*

# PRACTICE TEST ANSWER KEY

## Grade 5 English & Spanish Science

| Item Number | Item Type | Key | Standards |
|---|---|---|---|
| 1 | SA | B; D | SEP Constructing Explanations and Designing Solutions, DCI LS4.B Natural Selection, CCC Cause and Effect, **PE: 3-LS4-2**: Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. |
| 2 | SA | A; B, C | SEP Asking Questions and Defining Problems, DCI PS3.B Conservation of Energy and Energy Transfer, CCC Energy and Matter, **PE: 4-PS3-3**: Ask questions and predict outcomes about the changes in energy that occur when objects collide. |
| 3 | SA | *See pp. 4-5* | SEP Developing and Using Models, DCI LS1.B Growth and Development of Organisms, CCC Patterns, **PE: 3-LS1-1**: Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death. |
| 4 | CL | A | SEP Planning and Carrying Out Investigations, DCI PS1.A Structure and Properties of Matter, CCC Scale, Proportion, and Quantity, **PE: 5-PS1-3**: Make observations and measurements to identify materials based on their properties. |
| 5 | CL | D; D | SEP Planning and Carrying Out Investigations, DCI PS1.A Structure and Properties of Matter, **PE: 5-PS1-3**: Make observations and measurements to identify materials based on their properties. |
| 6 | CL | A | DCI PS1.B Chemical Reactions, CCC Cause and Effect, **PE: 5-PS1-4**: Conduct an investigation to determine whether the mixing of two or more substances results in new substances. |
| 7 | CL | A; A | DCI PS1.B Chemical Reactions, CCC Cause and Effect, **PE: 5-PS1-4**: Conduct an investigation to determine whether the mixing of two or more substances results in new substances. |
| 8 | CL | A; D | SEP Planning and Carrying Out Investigations, DCI ESS2.A Earth Materials and Systems, CCC Cause and Effect, **PE: 4-ESS2-1**: Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. |
| 9 | CL | D | SEP Planning and Carrying Out Investigations, DCI ESS2.A Earth Materials and Systems, CCC Cause and Effect, **PE: 4-ESS2-1**: Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. |
| 10 | CL | A | SEP Analyzing and Interpreting Data, DCI ESS2.B Plate Tectonics and Large-Scale System Interactions, CCC Patterns, **PE: 4-ESS2-2**: Analyze and interpret data from maps to describe patterns of Earth's features. |
| 11 | CL | A; C | SEP Analyzing and Interpreting Data, DCI ESS2.B Plate Tectonics and Large-Scale System Interactions, CCC Patterns, **PE: 4-ESS2-2**: Analyze and interpret data from maps to describe patterns of Earth's features. |

☐ = Written response SA = Stand Alone Item CL = Cluster Item

| Item Number | Item Type | Key | Standards |
|---|---|---|---|
| 12 | SA | A; B | SEP Obtaining, Evaluating, and Communicating Information, DCI ESS2.D Weather and Climate, CCC Patterns, **PE: 3-ESS2-2**: Obtain and combine information to describe climates in different regions of the world. |
| 13 | SA | C, E; A | SEP Developing and Using Models, DCI LS1.D Information Processing, CCC Systems and System Models, **PE: 4-LS1-2**: Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. |
| 14 | SA | *See p. 6* | SEP Engaging in Argument From Evidence, DCI ESS3.B Natural Hazards, CCC Cause and Effect, **PE: 3-ESS3-1**: Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard. |
| 15 | CL | C | SEP Engaging in Argument From Evidence, DCI LS4.C Adaptation, CCC Cause and Effect, **PE: 3-LS4-3**: Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all. |
| 16 | CL | D | SEP Engaging in Argument From Evidence, DCI LS2.C Ecosystem Dynamics, Functioning, and Resilience, CCC System and System Models, **PE: 3-LS4-4**: Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change. |
| 17 | CL | D; C | SEP Engaging in Argument From Evidence, DCI LS4.C Adaptation, **PE: 3-LS4-3**: Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all. |
| 18 | CL | B; B | DCI LS2.C Ecosystem Dynamics, Functioning, and Resilience, CCC System and System Models, **PE: 3-LS4-4**: Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change. |
| 19 | CL | A; A | SEP Constructing Explanations and Designing Solutions, DCI ETS1.A Defining and Delimiting an Engineering Problem, **PE: 4-PS3-4**: Apply scientific ideas to design, test, and refine a device that converts energy from one form to another. |
| 20 | CL | B | SEP Planning and Carrying Out Investigations, DCI PS3.B Conservation of Energy and Energy Transfer, CCC Energy and Matter, **PE: 4-PS3-2**: Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. |
| 21 | CL | A; B | SEP Constructing Explanations and Designing Solutions, DCI ETS1.A Defining and Delimiting an Engineering Problem, **PE: 4-PS3-4**: Apply scientific ideas to design, test, and refine a device that converts energy from one form to another. |
| 22 | CL | B | SEP Constructing Explanations and Designing Solutions, DCI ETS1.A Defining and Delimiting an Engineering Problem, **PE: 4-PS3-4**: Apply scientific ideas to design, test, and refine a device that converts energy from one form to another. |

| Item Number | Item Type | Key | Standards |
|---|---|---|---|
| 23 | SA | D; C | SEP Planning and Carrying Out Investigations, DCI PS2.A Forces and Motion, CCC Cause and Effect, **PE: 3-PS2-1**: Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object. |
| 24 | SA | D; D | DCI ESS3.B Natural Hazards, CCC Cause and Effect, **PE: 4-ESS3-2**: Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans. |
| 25 | SA | *See pp. 7-8* | SEP Developing and Using Models, DCI PS4.B Electromagnetic Radiation, CCC Cause and Effect, **PE: 4-PS4-2**: Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen. |
| 26 | CL | C; C | SEP Analyzing and Interpreting Data, DCI ESS1.B Earth and the Solar System, CCC Patterns, **PE: 5-ESS1-2**: Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. |
| 27 | CL | C | SEP Analyzing and Interpreting Data, DCI ESS1.B Earth and the Solar System, CCC Patterns, **PE: 5-ESS1-2**: Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. |
| 28 | CL | C | SEP Analyzing and Interpreting Data, DCI ESS1.B Earth and the Solar System, CCC Patterns, **PE: 5-ESS1-2**: Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. |
| 29 | CL | A; C | SEP Analyzing and Interpreting Data, DCI ESS1.B Earth and the Solar System, CCC Patterns, **PE: 5-ESS1-2**: Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. |
| 30 | CL | B | DCI LS2.B Cycles of Matter and Energy Transfer in Ecosystems, CCC Systems and System Models, **PE: 5-LS2-1**: Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. |
| 31 | CL | A, B; B | SEP Developing and Using Models, DCI LS2.B Cycles of Matter and Energy Transfer in Ecosystems, CCC Systems and System Models, **PE: 5-LS2-1**: Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. |
| 32 | CL | D | SEP Engaging in Argument From Evidence, DCI LS1.C Organization for Matter and Energy Flow in Organisms, CCC Energy and Matter, **PE: 5-LS1-1**: Support an argument that plants get the materials they need for growth chiefly from air and water. |
| 33 | CL | B; A | SEP Engaging in Argument From Evidence, DCI LS1.C Organization for Matter and Energy Flow in Organisms, CCC Energy and Matter, **PE: 5-LS1-1**: Support an argument that plants get the materials they need for growth chiefly from air and water. |

**Session 1**
**Scoring Rubric and Sample Student Response for PBT Item #3: Open-Ended**

| Score | Description |
|---|---|
| 4 | The response demonstrates thorough use of the three dimensions to make sense of scientific phenomena and/or to design solutions to problems. The response uses the models to describe one way the butterfly and clownfish life cycles are alike and one way they are different. The response also identifies which of the two life cycle models is most similar to the parrot's life cycle and describes one way that an animal's life cycle and the parrot's life cycle are alike and one way that an animal's life cycle and the parrot's life cycle are different. The response<br><br>• clearly applies science and engineering practices to provide an explanation or solution;<br>• provides a coherent and accurate explanation or solution based on disciplinary core ideas;<br>• reflects thorough understanding of complex ideas and crosscutting concepts; and<br>• effectively applies and demonstrates complete understanding of the three dimensions. |
| 3 | The response demonstrates sufficient use of the three dimensions to make sense of scientific phenomena and/or to design solutions to problems. The response may lack some detail or information, or the response may contain minor errors in applying and demonstrating understanding of science and engineering practices, disciplinary core ideas, and crosscutting concepts. |
| **2** | The response demonstrates limited use of the three dimensions to make sense of scientific phenomena and/or to design solutions to problems. The response may lack multiple details or information, or the response may contain major error(s) in applying and demonstrating understanding of science and engineering practices, disciplinary core ideas, and crosscutting concepts. |
| 1 | The response demonstrates minimal use of the three dimensions to make sense of scientific phenomena and/or to design solutions to problems. |
| **0** | The response is inaccurate, is irrelevant, or contains no evidence of use of the three dimensions to make sense of scientific phenomena and/or to design solutions to problems. |
| **Blank** | No response. |

Sample Student Response:

a. The two life cycles are alike because both animals begin as eggs. Then they get bigger. They both grow up and become adults. Both the butterfly and the clownfish babies are called something different from their grown-up names. The baby butterflies are called caterpillars and the baby clownfish are called larvae. The two life cycles are different because when a butterfly is young it looks very different from its parents. The baby clownfish looks similar to a clownfish (both have tails) when it is born. It is just smaller and has no fins. It takes years for a clownfish to grow, but it lives a long time. A butterfly takes only weeks to grow and only lives for four weeks.

*Note: Responses need only one of the many similarities and one of the many differences.*

b. The parrot's life cycle is more like the clownfish. Both animals begin as eggs. After birth, both animals look similar to but smaller than parents. They both get larger. The cycles are different because the parrot takes a longer time to grow up than the clownfish. Clownfish start out without stripes and grow stripes while parrots do not.

*Notes:*

- *A student may use a drawing of the parrot's life cycle in his or her description of similarities and differences. If so, it should look similar to that of the clownfish and there must be a description or label of what the student intends to be similar and different. The drawings of the parrot do not have to look like parrots. Responses without drawings are also acceptable if a detailed description is provided.*
- *Students are not required to know anything about feather colors and how they change on parrots, so reasonable statements about color/pattern changes in feathers can be accepted.*
- *Students are not required to use the scientific understanding of metamorphosis and chrysalises, etc. in descriptions of butterfly life cycles.*

**Session 2**
**Scoring Rubric and Sample Student Response for PBT Item #14: Open-Ended**

| Score | Description |
|---|---|
| **4** | The response demonstrates thorough use of the three dimensions to make sense of scientific phenomena and/or to design solutions to problems. The response explains what a score of 85 for the concrete pod design means, describes what will likely happen if a strong wave hits the wood fence design, and explains which design best meets Sid's criteria. The response<br><br>• clearly applies science and engineering practices to provide an explanation or solution;<br>• provides a coherent and accurate explanation or solution based on disciplinary core ideas;<br>• reflects thorough understanding of complex ideas and crosscutting concepts; and<br>• effectively applies and demonstrates complete understanding of the three dimensions. |
| **3** | The response demonstrates sufficient use of the three dimensions to make sense of scientific phenomena and/or to design solutions to problems. The response may lack some detail or information, or the response may contain minor errors in applying and demonstrating understanding of science and engineering practices, disciplinary core ideas, and crosscutting concepts. |
| **2** | The response demonstrates limited use of the three dimensions to make sense of scientific phenomena and/or to design solutions to problems. The response may lack multiple details or information, or the response may contain major error(s) in applying and demonstrating understanding of science and engineering practices, disciplinary core ideas, and crosscutting concepts. |
| **1** | The response demonstrates minimal use of the three dimensions to make sense of scientific phenomena and/or to design solutions to problems. |
| **0** | The response is inaccurate, is irrelevant, or contains no evidence of use of the three dimensions to make sense of scientific phenomena and/or to design solutions to problems. |
| | Blank, No response |

Sample Student Response:

a. A score of 85 means that the design can reduce a great deal of flood damage but cannot prevent some damage from occurring.

b. The waves will probably wash away the fence.

c. The best design for Sid is the concrete column design. Because the house is on stilts, the water will flow under the house. And because the columns are made of concrete, the columns can stand up to the powerful waves.

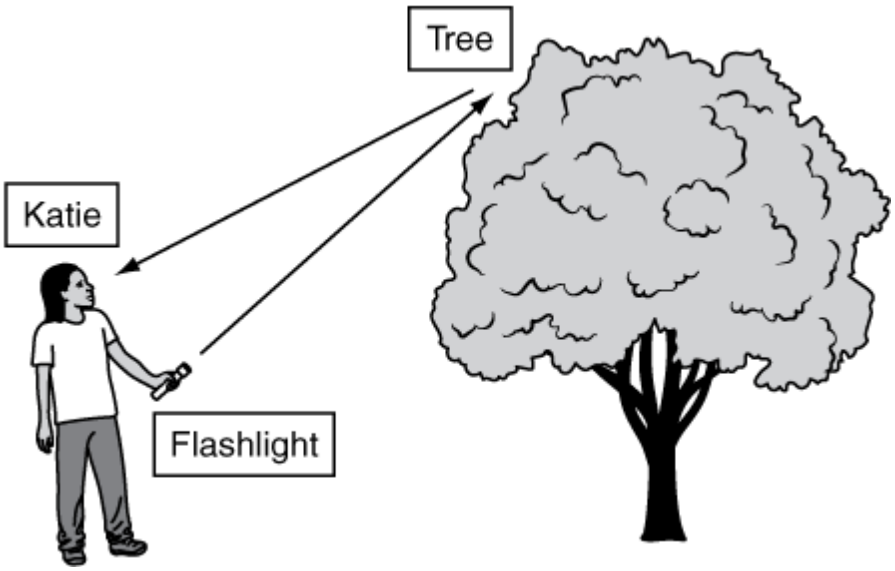
*NOTE: Award credit for other designs if the selection is well explained.*

**Session 3**
**Scoring Rubric and Sample Student Response for PBT Item #25: Open-Ended**

| Score | Description |
|---|---|
| **4** | The response demonstrates thorough use of the three dimensions to make sense of scientific phenomena and/or to design solutions to problems. The response uses the objects and arrows showing the path of light to draw a model that shows how Katie is able to see the tree and uses the model to describe how Katie is able to see the tree. The response also predicts how well Katie will be able to see the tree if there is thick fog in the woods. The response<br><br>• clearly applies science and engineering practices to provide an explanation or solution;<br>• provides a coherent and accurate explanation or solution based on disciplinary core ideas;<br>• reflects thorough understanding of complex ideas and crosscutting concepts; and<br>• effectively applies and demonstrates complete understanding of the three dimensions. |
| **3** | The response demonstrates sufficient use of the three dimensions to make sense of scientific phenomena and/or to design solutions to problems. The response may lack some detail or information, or the response may contain minor errors in applying and demonstrating understanding of science and engineering practices, disciplinary core ideas, and crosscutting concepts. |
| **2** | The response demonstrates limited use of the three dimensions to make sense of scientific phenomena and/or to design solutions to problems. The response may lack multiple details or information, or the response may contain major error(s) in applying and demonstrating understanding of science and engineering practices, disciplinary core ideas, and crosscutting concepts. |
| **1** | The response demonstrates minimal use of the three dimensions to make sense of scientific phenomena and/or to design solutions to problems. |
| **0** | The response is inaccurate, is irrelevant, or contains no evidence of use of the three dimensions to make sense of scientific phenomena and/or to design solutions to problems. |
| **Blank** | No response. |

Sample Student Response:

a. The model should look similar to the following: one arrow pointing from the flashlight toward the tree and one arrow pointing from the tree toward the person's head. Angles of incidence and reflection do not have to be equal. The arrows do not have to begin on the objects. The arrows do not have to meet at the same place on the tree. Students do not have to include objects in the drawing.



b. For Katie to see the tree, light must travel from a light source to the tree and then reflect off the tree and travel to Katie's eyes.

c. In thick fog, Katie will not be able to see the tree as well. The model shows that light must travel from the flashlight to the tree and then reflect off the tree to Katie's eyes. Thick fog would block some of the light from traveling this path. Less light from the flashlight will reach the tree, thus less light from the tree will reach Katie's eyes. The tree will be less bright, more blurry. Light scattered away from the direct path will make the fog bright, which will make the tree harder to see.

*NOTE: Students do not need to refer back to the model for part c.*