NEW MEXICO ASSESSMENT OF SCIENCE READINESS

PRACTICE TEST ANSWER KEY

Grade 8 English & Spanish Science

Item Number	Item Type	Key	Standards
1	SA	A; A	SEP Analyzing and Interpreting Data, DCI ESS1.B Earth and the Solar System, CCC Scale, Proportion, and Quantity, **PE: MS-ESS1-3**: Analyze and interpret data to determine scale properties of objects in the solar system.
2	SA	A; A	SEP Using Mathematics and Computational Thinking, DCI PS3.B Wave Properties, CCC Patterns, **PE: MS-PS4-1**: Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.
3	SA	A; B	SEP Constructing Explanations and Designing Solutions, DCI LS4.B Natural Selection, CCC Cause and Effect, **PE: MS-LS4-4**: Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.
4	SA	*See pp. 4-5*	SEP Developing and Using Models, DCI ESS2.D Weather and Climate, CCC Systems and System Models, **PE: MS-ESS2-6**: Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
5	CL	B	SEP Developing and Using Models, DCI PS1.B Chemical Reactions, CCC Energy and Matter, **PE: MS-PS1-5**: Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.
6	CL	D; A	SEP Developing and Using Models, DCI PS1.B Chemical Reactions, CCC Energy and Matter, **PE: MS-PS1-5**: Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.
7	CL	C	SEP Developing and Using Models, DCI PS1.A Structure and Properties of Matter, CCC Scale, Proportion, and Quantity, **PE: MS-PS1-1**: Develop models to describe the atomic composition of simple molecules and extended structures.
8	CL	B; C	SEP Developing and Using Models, DCI PS1.A Structure and Properties of Matter, **PE: MS-PS1-1**: Develop models to describe the atomic composition of simple molecules and extended structures.
9	CL	B; D	SEP Constructing Explanations and Designing Solutions, DCI LS1.C Organization for Matter and Energy Flow in Organisms, CCC Energy and Matter, **PE: MS-LS1-6**: Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
10	CL	B, D	SEP Constructing Explanations and Designing Solutions, DCI LS1.C Organization for Matter and Energy Flow in Organisms, CCC Energy and Matter, **PE: MS-LS1-6**: Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
11	CL	A; D	SEP Analyzing and Interpreting Data, DCI LS2.A Interdependent Relationships in Ecosystems, CCC Cause and Effect, **PE: MS-LS2-1**: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
12	CL	B	SEP Analyzing and Interpreting Data, DCI LS2.A Interdependent Relationships in Ecosystems, CCC Cause and Effect, **PE: MS-LS2-1**: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

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

Practice Test Answer Key • Grade 8 Science

Item Number	Item Type	Key	Standards
13	SA	D, E; A	SEP Analyzing and Interpreting Data, DCI LS4.A Evidence of Common Ancestry and Diversity, CCC Patterns, **PE: MS-LS4-3**: Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.
14	SA	A; D	SEP Constructing Explanations and Designing Solutions, DCI ESS3.C Human Impacts on Earth Systems, CCC Cause and Effect, **PE: MS-ESS3-3**: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
15	SA	*See p. 6*	SEP Engaging in Argument From Evidence, DCI LS1.B Growth and Development of Organisms, CCC Cause and Effect, **PE: MS-LS1-4**: Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.
16	CL	C	SEP Planning and Carrying Out Investigations, DCI ESS2.D Weather and Climate, CCC Cause and Effect, **PE: MS-ESS2-5**: Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.
17	CL	B	DCI ESS2.C The Roles of Water in Earth's Surface Processes, CCC Cause and Effect, **PE: MS-ESS2-5**: Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.
18	CL	D; C	DCI ESS2.D Weather and Climate, CCC Systems and System Models, **PE: MS-ESS2-6**: Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
19	CL	A; A	SEP Planning and Carrying Out Investigations, DCI ESS2.C The Roles of Water in Earth's Surface Processes, CCC Cause and Effect, **PE: MS-ESS2-5**: Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.
20	CL	B; D	SEP Planning and Carrying Out Investigations, DCI PS2.A Forces and Motion, **PE: MS-PS2-2**: Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.
21	CL	C	SEP Planning and Carrying Out Investigations, DCI PS2.A Forces and Motion, CCC Stability and Change, **PE: MS-PS2-2**: Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.
22	CL	C; C	SEP Engaging in Argument From Evidence, DCI PS3.B Conservation of Energy and Energy Transfer, CCC Energy and Matter, **PE: MS-PS3-5**: 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.
23	CL	A	SEP Engaging in Argument From Evidence, DCI PS3.B Conservation of Energy and Energy Transfer, CCC Energy and Matter, **PE: MS-PS3-5**: 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.

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Item Number	Item Type	Key	Standards
24	SA	B; C	SEP Constructing Explanations and Designing Solutions, DCI PS2.A Forces and Motion, CCC Systems and System Models, **PE: MS-PS2-1**: Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.
25	SA	A; C	SEP Developing and Using Models, DCI LS3.B Variation of Traits, CCC Cause and Effect, **PE: MS-LS3-2**: Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.
26	SA	C; C	SEP Obtaining, Evaluating, and Communicating Information, DCI PS4.C Information Technologies and Instrumentation, **PE: MS-PS4-3**: Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.
27	SA	*See pp. 7-8*	SEP Developing and Using Models, DCI PS1.A Structure and Properties of Matter, PS3.A Definitions of Energy, CCC Cause and Effect, **PE: MS-PS1-4**: Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.
28	CL	C; C	SEP Developing and Using Models, DCI LS2.B Cycles of Matter and Energy Transfer in Ecosystems, **PE: MS-LS2-3**: Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
29	CL	A, B, D, E	DCI LS2.B Cycles of Matter and Energy Transfer in Ecosystems, CCC Energy and Matter, **PE: MS-LS2-3**: Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
30	CL	D	DCI PS3.D Energy in Chemical Processes and Everyday Life, LS1.C Organization for Matter and Energy Flow in Organisms, CCC Energy and Matter, **PE: MS-LS1-6**: Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
31	CL	C; B	SEP Constructing Explanations and Designing Solutions, DCI PS3.D Energy in Chemical Processes and Everyday Life, LS1.C Organization for Matter and Energy Flow in Organisms, CCC Energy and Matter, **PE: MS-LS1-6**: Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
32	CL	A	DCI ESS2.C The Roles of Water in Earth's Surface Processes, CCC Cause and Effect, **PE: MS-ESS2-5**: Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.
33	CL	B, D, E	SEP Analyzing and Interpreting Data, DCI ESS3.B Natural Hazards, CCC Patterns, **PE: MS-ESS3-2**: Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
34	CL	C; D	SEP Planning and Carrying Out Investigations, DCI ESS2.C The Roles of Water in Earth's Surface Processes, **PE: MS-ESS2-5**: Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.
35	CL	A; B	SEP Analyzing and Interpreting Data, DCI ESS3.B Natural Hazards, **PE: MS-ESS3-2**: Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

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

Session 1

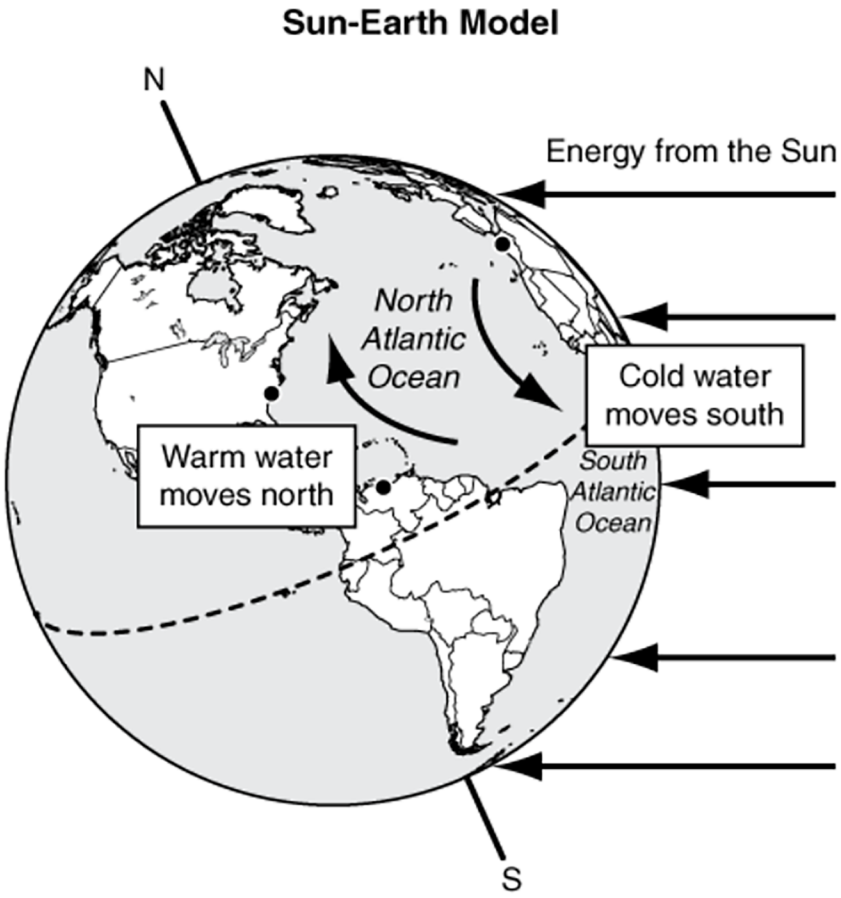
Scoring Rubric and Sample Student Response for PBT Item #4: Open-Ended

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 model to explain one reason for the difference in temperature between Caracas and Myrtle Beach. The response also describes ocean currents that could be added to the model to provide another reason for the differences in temperature between the cities and includes the direction and temperature of the currents near Caracas, Myrtle Beach, and Casablanca. The response • clearly applies science and engineering practices to provide an explanation or solution; • provides a coherent and accurate explanation or solution based on disciplinary core ideas; • reflects thorough understanding of complex ideas and crosscutting concepts; and • 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 shows that while the Sun's rays reach Caracas at an almost direct/perpendicular/90 degree angle, the rays reach Myrtle Beach at a more indirect/flatter/less than 90 degree angle. The farther a city is from the equator, the more the Sun's energy at a location is spread out across Earth's surface.

b. [Draw]



[Describe]

In the North Atlantic Ocean, warm water flows north from the equator from Caracas to Myrtle Beach. Cold water moved south from Casablanca toward the equator.

c. The ocean plays a major role and has a great effect on weather and climate. Energy from the Sun is absorbed by the ocean, released slowly over time, and then globally redistributed through wind and ocean currents. As warm water flows north from the equator, cold water flows south. Thermal energy moves from areas of high temperature to areas of low temperatures via conduction of heat from warmer objects (the warm water) to cooler objects (the cool land).

Session 2

Scoring Rubric and Sample Student Response for PBT Item #15: 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 constructs an argument that the behavior of individual orchid bees affects reproduction in the orchid bee population, uses information that Henry learned to support the argument, and supports the scientist's claim that orchid plants have evolved to produce the specific scents that attract female orchid bees with evidence that explains how one characteristic of an orchid plant affects the reproduction of the orchid species. The response • clearly applies science and engineering practices to provide an explanation or solution; • provides a coherent and accurate explanation or solution based on disciplinary core ideas; • reflects thorough understanding of complex ideas and crosscutting concepts; and • 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 more attract the scent collected by the male bee, the more likely it is that he will be chosen by a female. It is specifically important for them to find a good mate since female orchid bees usually mate just once in their lifetime.

b. Orchids have evolved to cater specifically to an orchid bee's preferences. The male bees are looking for oils to collect for an attractive scent. The plants make an oil to attract males who want to change their scent. As a male bee crawls into the flower of an orchid to search for and collect the perfume, the orchids get their pollen on the back of the male bee. The pollen is transported to the next flower of the same species that the bee visits. In this manner, the bee's pollination is more effective. Bees will look for other plants which make the same oil and more orchids than can reproduce with each other are pollinated with pollen from other orchids with the same scent.

Session 3

Scoring Rubric and Sample Student Response for PBT Item #27: 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 draws models to compare a helium-filled balloon in three locations: inside the store, outside during the walk home, and inside the home. Each model shows the arrangement, spacing, and motion of the helium atoms inside the balloon and the temperature of the helium-filled balloon. The response also describes what the models in part (a) show about the relationship between the temperature of the helium-filled balloon, the kinetic energy of the helium atoms, and the speed of the helium atoms, and uses the models to explain why the balloons are large inside the house and store but not outside during the walk home. The response • clearly applies science and engineering practices to provide an explanation or solution; • provides a coherent and accurate explanation or solution based on disciplinary core ideas; • reflects thorough understanding of complex ideas and crosscutting concepts; and • 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.

Inside Home/Store T = 21°C	Outside During Walk Home T = –2°C
	

b. The particles move less/more slowly because (thermal) energy leaves the balloon/the particles (atoms, Helium) inside the balloon have less (kinetic) energy/ the temperature inside the balloon decreases.

c. In the colder balloon, the particles don't move as much and get closer together. The particles hit the balloon less hard and less often so the balloon gets smaller.