# CMAS Science 2023 Performance Level Descriptors
# Grade 5 Science

**Partially Met Expectations**
Students who demonstrate a limited command of the concepts, skills, and practices embodied by the Colorado Academic Standards assessed at their grade level. They will need additional academic support to engage successfully in further studies in this content area.

**Approached Expectations**
Students who demonstrate a moderate command of the concepts, skills, and practices embodied by the Colorado Academic Standards assessed at their grade level. They will likely need additional academic support to engage successfully in further studies in this content area.

**Met Expectations**
Students who demonstrate a strong command of the concepts, skills, and practices embodied by the Colorado Academic Standards assessed at their grade level. They are academically prepared to engage successfully in further studies in this content area.

**Exceeded Expectations**
Students who demonstrate a distinguished command of the concepts, skills, and practices embodied by the Colorado Academic Standards assessed at their grade level. They are academically well prepared to engage successfully in further studies in this content area.

**Color Legend for Three-Dimensional Alignment**

Colorado Essential Skills and Science and Engineering Practice

Grade Level Expectation

Cross Cutting Concept

| Physical Science | | | | |
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| | **Partially Met Expectations** | **Approached Expectations** | **Met Expectations** | **Exceeded Expectations** |
| **PG 1.** | **Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding structure, properties, and interactions of matter.** | | | |
| **GLE 1.1** | Use a familiar model to describe matter as consisting of particles.<br>**OR**<br>Explain that some matter is on a scale too small to be seen.<br>[1.1.a] | Use a familiar model to describe matter as consisting of particles and relate that the scale of those particles makes them too small to be seen.<br>[1.1.a] | Develop models from previously encountered or well-practiced ideas to describe that matter consists of particles that are too small in scale to be seen.<br>[1.1.a] | Develop and refine models to describe that even when an object is immensely large, the matter in it consists of particles that are too small in scale to be seen.<br>[1.1.a] |
| | While following explicit procedural methods, make observations of properties used to identify materials and objects.<br>**OR**<br>Identify materials and objects as having different properties that can be described with units of measure for weight, time, temperature, and volume.<br>[1.1.b] | While following explicit procedural methods, make observations of properties used to identify materials and objects, and demonstrate simple, mechanical aspects of standard units of measure for weight, time, temperature, and volume.<br>[1.1.b] | When investigating phenomena referenced in the EO, observe, measure, and make predictions using scale, proportion, and quantity in standard units (weight, time, temperature, and volume), to routinely identify materials from the very small to the immensely large, based on their properties.<br>[1.1.b] | Engage in phenomena not referenced in the EO to investigate how to use scale, proportion, and quantity to interpret and evaluate observations or measurements of properties to identify materials.<br>[1.1.b] |

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| **GLE 1.2** | Exhibit variable degrees of success in measuring and describing the change in quantities of matter when heating, cooling, or mixing substances.<br>[1.2.a] | Measure and/or use simple graphs of quantities such as weight when heating, cooling, or mixing substances to show that matter is conserved in these processes.<br>[1.2.a] | Measure and describe changes in quantities such as weight when heating, cooling, or mixing substances according to clearly established procedures, and/or interpret provided graphs to compare the quantity of matter before and after such changes.<br>[1.2.a] | Measure and create and/or use complex graphs of quantities such as weight when heating, cooling, or mixing substances to show that matter is conserved in these processes regardless of other observed changes.<br>[1.2.a] |
| | Identify changes caused by the mixing of substances.<br>**OR**<br>Follow provided investigational procedures to mix substances and describe the observed results.<br>[1.2.b] | Follow provided investigational procedures to mix substances, observe and/or use the results, to explain that the production of a new substance is a possible effect of a chemical change.<br>[1.2.b] | Conduct and/or use an investigation to determine whether the process of mixing substances causes new substances to form.<br>[1.2.b] | Plan and conduct and/or use an investigation to determine whether the process of mixing substances causes new substances to form.<br>[1.2.b] |
| **GLE 1.3** | Identify gravity as the cause that makes objects fall toward the ground.<br>[1.3.a] | Use or describe evidence that Earth's gravity is a force that pulls objects down.<br>[1.3.a] | Use or describe evidence to support or make an argument that Earth's gravity is the cause of a force that pulls objects toward the center of the planet.<br>[1.3.a] | Use evidence, data, and models to engage in argument about "down" being a local description of the direction of Earth's gravity, which causes objects near its surface to be pulled toward its center.<br>[1.3.a] |
| **GLE 1.4** | Use a simple model to show that the Sun and plants contribute to animals' food.<br>**OR**<br>Describe, in simple, mechanistic terms, that animals' food is dependent on light coming from the Sun.<br>[1.4.a] | Use a simple model to illustrate the transfer of energy from the Sun to the substances animals use for food.<br>[1.4.a] | Use models to interpret multiple facets of information showing that energy in animals' food was once energy from the Sun and has been transferred in various ways between objects.<br>[1.4.a] | Develop a model to make novel connections between the ability of energy to be transferred between objects and the understanding that energy in animals' food was once energy from the Sun.<br>[1.4.a] |

| Life Science | | | | |
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| | **Partially Met Expectations** | **Approached Expectations** | **Met Expectations** | **Exceeded Expectations** |
| **PG 6.** | **Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how living systems interact with the biotic and abiotic environment.** | | | |
| **GLE 2.1** | Describe evidence that plants use air and water for growth.<br>**OR**<br>Describe plants as needing several kinds of matter for growth.<br>[2.1.a] | Use evidence to describe the flow of matter between the air, water, and plants.<br>[2.1.a] | Use evidence, data, or models to support an argument about the flow of matter that allows plants to get the materials they need for growth primarily from air and water (not from the soil).<br>[2.1.a] | Use evidence, data, or models to support an argument about the flow of matter that allows both ordinary and unusual plants and other plantlike structures, such as algae, to get the materials they need for growth primarily from air and water (not from the soil).<br>[2.1.a] |
| **GLE 2.2** | Use a simple, familiar model to show how matter cycles between air, soil, and organisms.<br>**OR**<br>Describe how matter cycles between the system of air, soil, and organisms.<br>[2.2.a] | Use a simple, familiar model to describe environmental components and their interactions as a system in which matter cycles between air, soil, plants, animals, and decomposers.<br>[2.2.a] | Develop a model to explain ecosystems as a set of environmental components and how they interact in the cycling of matter between air, soil, plants, animals, and decomposers, including microbes.<br>[2.2.a] | Analyze and compare models of ecosystems, environmental components, and their interactions in the cycling of matter and energy between air, soil, plants, animals, and decomposers, including microbes.<br>[2.2.a] |

| Earth and Space Science | | | | |
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| | **Partially Met Expectations** | **Approached Expectations** | **Met Expectations** | **Exceeded Expectations** |
| **PG 9.** | **Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding the universe and Earth's place in it.** | | | |
| **GLE 3.1** | Use evidence to compare the relative brightness of the Sun and stars.<br>**OR**<br>Identify distance from Earth as a factor in the Sun's brightness compared to stars, and describe the distance between Earth and the stars as immensely large.<br>[3.1.a] | Interpret routine evidence, data, or models that relate a star's distance from Earth to its relative brightness.<br>**OR**<br>Describe stars as differing greatly in size and distance.<br>[3.1.a] | Use evidence, data, or models to support an argument that a star's distance from Earth affects its relative brightness, and that the Sun's apparent brightness is due to this effect.<br>**OR**<br>Support an argument that stars differ greatly in size and distance.<br>[3.1.a] | Use evidence, data, or models to support an argument about the impact of interstellar distances on the relative brightness of stars in familiar and unfamiliar contexts (e.g., how the Sun's appearance would be different when viewed from Pluto or from the planets of another star).<br>[3.1.a] |
| **GLE 3.2** | Use simple, familiar graphical displays to show daily changes in day and night, and in length and direction of shadows.<br>**OR**<br>Describe, using simple, familiar patterns, daily changes in day and night, and in length and direction of shadows.<br>[3.2.a] | Follow clearly prescribed procedures to represent data in a simple graphical display that shows patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.<br>[3.2.a] | Make and record observations and data in a graphical display that shows patterns due to Earth's orbit and rotation and the orbit of the Moon around Earth, including daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.<br>[3.2.a] | Analyze observations and complex data or graphical displays that show complicated or simultaneous patterns due to Earth's orbit and rotation and the orbit of the Moon around Earth, including daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.<br>[3.2.a] |

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| **GLE 3.3** | When provided familiar models of two Earth systems interacting, identify one or both of the systems (i.e., geosphere, hydrosphere, atmosphere, and biosphere), or describe an impact of the interaction on at least one of them. [3.3.a] | Use familiar models to describe Earth's major systems (i.e., geosphere, hydrosphere, atmosphere, and biosphere) and how they interact to affect Earth's surface materials and processes. [3.3.a] | Develop a model to describe interactions between Earth's major systems (i.e., geosphere, hydrosphere, atmosphere, and biosphere) and the impact of these interactions on Earth's surface materials and processes. [3.3.a] | Develop, analyze, or compare novel models of interactions between Earth's major systems (i.e., geosphere, hydrosphere, atmosphere, and biosphere), or suggest ways that some interactions might affect the overall system of Earth's surface materials and processes. [3.3.a] |
| **GLE 3.4** | Use standard units to describe the amounts and percentages of water in various reservoirs and distinguish between salt water and freshwater. [3.4.a] | Use provided graphs to identify or describe the relative amounts of salt water and freshwater in various reservoirs. [3.4.a] | Use, describe, and/or graph quantities such as area, volume, and weight, provided in standard units, to relate the amounts and proportions of salt water and freshwater in various reservoirs (oceans, lakes, rivers, glaciers, groundwater, and polar ice caps). [3.4.a] | Communicate, with graphs of multiple interrelated quantities such as area, volume, and weight, findings about the amounts and proportions of salt water and freshwater in various reservoirs (oceans, lakes, rivers, glaciers, groundwater, and polar ice caps). [3.4.a] |

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| **GLE 3.5** | Communicate one or more societal activities that have had effects on land, ocean, atmosphere, or outer space.<br>**OR**<br>Describe societal activities as one part of interacting natural systems, with others being land, ocean, atmosphere, or outer space. | Communicate information about ways societal activities have had major effects on natural systems, whether land, ocean, atmosphere, or outer space. | Obtain and combine information from reliable, familiar media about societal activities that have had major effects on systems, including land, ocean, atmosphere, and outer space. | Explore novel and complex information sources to obtain and combine reliable information on societal activities that have had major effects on systems and system components of land, ocean, atmosphere, and outer space. |
| | Describe science ideas as one tool that communities can use to protect the environment.<br>**OR**<br>Identify the environment as a system communities can protect.<br>[3.5.a] | Summarize provided information about ways individual communities can protect Earth's resources, environment and systems.<br>[3.5.a] | Communicate findings about ways individual communities use science ideas to protect Earth's resources, environment, and systems.<br>[3.5.a] | Evaluate information about scientific solutions that individual communities might use to protect Earth's resources, environment, and systems, including unintentional effects on those systems.<br>[3.5.a] |