CoAlt Science 2023 Performance Level Descriptors
Grade 8 Science
Based on the 2020 Colorado Academic Standards with Extended Evidence Outcomes for Middle School Science

Emerging
Students performing at this level demonstrate an initial understanding of concepts and skills represented by the Extended Evidence Outcomes (EEOs) of the Colorado Academic Standards (CAS). They will need extensive academic supports to engage successfully in further studies in the content area.

Approaching Target
Students performing at this level demonstrate a limited understanding of concepts and skills represented by the EEOs of the CAS. They will likely need moderate academic supports to engage successfully in further studies in the content area.

At Target
Students performing at this level demonstrate a foundational understanding of concepts and skills represented by the EEOs of the CAS. They are academically prepared to engage in further studies in the content area with appropriate supports.

Advanced
Students performing at this level demonstrate a solid understanding of the concepts and skills represented by the EEOs of the CAS. They are academically well prepared to engage in further studies in the content area with appropriate supports.

Color Legend for Three-Dimensional Alignment


Colorado Essential Skills and Science and Engineering Practice


Grade Level Expectation


Cross Cutting Concept

Physical Science				
	Emerging	**Approaching Target**	**At Target**	**Advanced**
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, 1.2	Identify that a molecule is made up of other particles (atoms). (MS.1.1.a)	Identify a model of a simple molecule, such as water, oxygen, methane, etc. (MS.1.1.a)	Create models of simple molecules and more complex structures, such as water, oxygen, methane, etc. **OR** Use models to compare scale, proportion, or quantity among simple molecules and more complex structures such as water, oxygen, methane, etc. (MS.1.1.a)	Create models that represent differences in scale, proportion, or quantity among simple molecules and more complex structures, such as water, oxygen, methane, etc. (MS.1.1.a)
	Identify a property that changes because of a chemical change. (MS.1.1.b)	Identify a chemical change based on a change in one property of one substance. (MS.1.1.b)	Analyze data to identify the similarities and differences of the properties of a substance before and after a chemical change. (MS.1.1.b)	Analyze data to identify evidence of a chemical change based on the similarities and differences of the properties of a substance before and after a change. (MS.1.1.b)
		Identify that natural resources can be used to make new, synthetic materials. (MS.1.1.c)	Use information to identify an appropriate natural resource for making a new, synthetic material. (MS.1.1.c)	Use information to identify a change in the structure and function of a natural resource that is transformed to make a new, synthetic material. (MS.1.1.c)
		Identify that a change in temperature can cause a change in the state of a pure substance. (MS.1.1.d)	Use a model to identify what happens when changes in temperature change the state of a pure substance. (MS.1.1.d)	Create a model to explain what happens when changes in temperature change the state of a pure substance. (MS.1.1.d)
	Identify a property of an object that changes because of a chemical change. (MS.1.2.a)	Identify a chemical change based on a change in energy. (MS.1.2.a)	Use graphical displays to identify the similarities and differences of the properties of a substance before and after a chemical change. (MS.1.2.a)	Use graphical displays to identify evidence of a chemical change based on the similarities and differences of the properties of a substance before and after a change. (MS.1.2.a)

Physical Science				
	Emerging	**Approaching Target**	**At Target**	**Advanced**
	Identify that atoms have mass. (MS.1.2.b)	Use a model to identify that the number or the mass of atoms does not change in a chemical reaction. (MS.1.2.b)	Use a model to identify that the number or the mass of atoms does not change in a chemical reaction, they are just rearranged. (MS.1.2.b)	Create a model to demonstrate how the number or the mass of atoms does not change in a chemical reaction, they are just rearranged. (MS.1.2.b)
		Identify a device that releases or absorbs thermal energy by chemical processes. (MS.1.2.c)	Explain the operation of a device that releases or absorbs thermal energy by chemical processes. (MS.1.2.c)	Propose the design, a test, or a modification of a device that releases or absorbs thermal energy by chemical processes. (MS.1.2.c)
PG 2.	**Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding interactions between objects and within systems of objects.**			
GLE 1.3, 1.4	Identify a force as what makes objects move, change direction, or become damaged. (MS.1.3.a)	Identify a solution that reduces the force of impact in a collision of two objects in which one is in motion, and one is stationary. (MS.1.3.a)	Identify a solution that reduces the force of impact in a collision of two objects in motion. (MS.1.3.a)	Design a solution to reduce the force of impact in a collision of two objects in motion or in which one is in motion, and one is stationary. (MS.1.3.a)
	Identify a force as what makes objects move or change direction. (MS.1.3.b)	Use an investigation to predict that objects with greater mass will impact with greater force than objects with less mass moving at the same speed. (MS.1.3.b)	Use an investigation to predict that the motion of objects with less mass will change more than the motion of objects with more mass when acted upon by an equivalent force. (MS.1.3.b)	Plan an investigation that provides evidence that the motion of objects with less mass will change more than the motion of objects with more mass when acted upon by an equivalent force. (MS.1.3.b)
	Identify that electromagnetic forces can act at a distance. (MS.1.4.a)	Identify a factor that affects the strength of electromagnetic forces. (MS.1.4.a)	Use an investigation to determine factors that affect the strength of electromagnetic forces. (MS.1.4.a)	Ask questions about evidence gathered from an investigation about factors that affect the strength of electromagnetic forces. **OR** Plan an investigation to determine factors that affect the strength of electromagnetic forces. (MS.1.4.a)

Physical Science				
	Emerging	**Approaching Target**	**At Target**	**Advanced**
	Identify that gravitational forces can act at a distance. (MS.1.4.b)	Identify mass or distance as a factor that affects the gravitational forces on interacting objects. (MS.1.4.b)	Identify a model or visual representation that shows evidence of gravitational forces on interacting objects of different mass. (MS.1.4.b)	Construct a graph, model, or visual representation to show evidence of gravitational forces on interacting objects of different mass. (MS.1.4.b)
	Identify that electromagnetic forces can act at a distance. (MS.1.4.c)	Identify an electric or magnetic field as a cause of the exertion of force on an object. **OR** Identify evidence from an investigation that electric or magnetic fields exist. (MS.1.4.c)	Identify evidence from an investigation that electric or magnetic fields exist between objects exerting forces on each other even though the objects are not in contact. (MS.1.4.c)	Plan an investigation that provides evidence that electric or magnetic fields exist between objects exerting forces on each other even though the objects are not in contact. (MS.1.4.c)
PG 3.	**Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding of how energy is transferred and conserved.**			
GLE 1.5 1.6, 1.7		Identify that the mass and the speed of an object affects the kinetic energy of the object. (MS.1.5.a)	Use graphical displays of data to identify the relationship of the kinetic energy of an object to the mass and the speed of the object. (MS.1.5.a)	Use graphical displays of data showing the relationship of kinetic energy to mass and speed to predict the mass, speed, or kinetic energy of an object. (MS.1.5.a)
		Identify that the distance between interacting objects affects the potential energy stored in the system. (MS.1.5.b)	Use a model to identify that when the position of objects interacting at a distance changes, different amounts of potential energy are stored in the system. (MS.1.5.b)	Create a model to demonstrate that when the position of objects interacting at a distance changes, different amounts of potential energy are stored in the system. (MS.1.5.b)
	Identify that more or less thermal energy makes an object feel warmer or colder. (MS.1.5.c)	Identify a device that either minimizes or maximizes thermal energy transfer. (MS.1.5.c)	Compare data to identify a device that either minimizes or maximizes thermal energy transfer. (MS.1.5.c)	Compare data to explain how a device either minimizes or maximizes thermal energy transfer. (MS.1.5.c)
	Identify a change in temperature as evidence of energy transfer. **OR** Identify a change in feeling of warmth or coolness as evidence of energy transfer. (MS.1.5.d)	Use an investigation to identify evidence that an energy transfer occurs when the temperature of an object changes. (MS.1.5.d)	Use an investigation to identify evidence that an energy transfer occurs between objects when their temperatures are different. (MS.1.5.d)	Plan an investigation to identify evidence that a change in temperature measures energy transfer between objects of different masses and different types of materials. (MS.1.5.d)

Physical Science				
	Emerging	**Approaching Target**	**At Target**	**Advanced**
	Identify a change in temperature or phase change as evidence of energy transfer. (MS.1.5.e)	Identify the direction of energy transfer based on a change in temperature of an object. (MS.1.5.e)	Use an investigation to support the claim that the transfer of energy between two objects can be measured by temperature. (MS.1.5.e)	
		Identify a device that minimizes or maximizes thermal energy transfer from one object to another. (MS.1.6.a)	Explain the operation of a device that minimizes or maximizes thermal energy transfer from one object to another. (MS.1.6.a)	Propose the design, a test, or a modification of a device to minimize or maximize thermal energy transfer from one object to another. (MS.1.6.a)
		Identify that the temperature of an object is a measure of the average kinetic energy of the particles making up the object. (MS.1.6.b)	Identify a relationship between the energy transferred to or from an object and the average kinetic energy of the particles making up the object, as measured by the temperature of the object. **OR** Demonstrate an understanding that the average kinetic energy of the particles making up an object, as measured by the temperature of the object, changes when kinetic energy is transferred to or from the object. (MS.1.6.b)	Demonstrate understanding of a relationship between the energy transferred to or from an object, the type of matter making up the object, the mass of the object, and the change in the average kinetic energy of the particles making up the object, as measured by the temperature of the object. (MS.1.6.b)
		Identify a change in direction of motion as a case of kinetic energy transfer. (MS.1.6.c)	Use a diagram to show that a change in direction or speed of motion is evidence of kinetic energy transfer from one object or another. (MS.1.6.c)	Create a diagram to show that a change in direction or speed of motion is evidence of kinetic energy transfer from one object or another. (MS.1.6.c)

Physical Science				
	Emerging	**Approaching Target**	**At Target**	**Advanced**
	Identify that the position of an object affects the potential energy associated with it. (MS.1.7.a)	Use a model to identify when an object has more or less potential energy associated with it. (MS.1.7.a)	Use a model to identify that when the position of objects interacting at a distance changes, different amounts of potential energy are stored in the system. (MS.1.7.a)	Create a model to demonstrate that when the position of objects interacting at a distance changes, different amounts of potential energy are stored in the system. (MS.1.7.a)
PG 4.	**Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding of how waves are used to transfer energy and information.**			
GLE 1.8, 1.9, 1.10	Identify waves as a carrier of energy. (MS.1.8.a)	Identify that a wave has an observable property (e.g., loudness or brightness) because it has energy. (MS.1.8.a)	Identify how an observable property of the amplitude of waves (e.g., loudness or brightness) is related to the energy in the wave. (MS.1.8.a)	Use a visual representation, simple graph, or table to show how the amplitude of a wave is related to the energy in the wave. (MS.1.8.a)
	Identify that different materials can affect the reflection, absorption, or transmission of a sound wave. **OR** Identify a material that most or least affects the reflection, absorption, or transmission of a sound wave. (MS.1.8.b)	Identify how a property of a material affects the reflection, absorption, or transmission of a sound wave. **OR** Use a visual representation to identify that different materials can affect the reflection, absorption, or transmission of a sound wave. (MS.1.8.b)	Use a visual representation to show that the reflection, absorption, or transmission of a sound wave is affected by the properties of a material. (MS.1.8.b)	Use multiple representations to demonstrate how sound waves are reflected, absorbed, or transmitted through various materials. (MS.1.8.b)
	Identify that different materials can affect the reflection, absorption, or transmission of a light wave. **OR** Identify a material that most or least affects the reflection, absorption, or transmission of a light wave. (MS.1.9.a)	Identify how a property of a material affects the reflection, absorption, or transmission of a light wave. **OR** Use a visual representation to identify that different materials can affect the reflection, absorption, or transmission of a light wave. (MS.1.9.a)	Use a visual representation to show that the reflection, absorption, or transmission of a light wave is affected by the properties of a material. (MS.1.9.a)	Use multiple representations to demonstrate how light waves are reflected, absorbed, or transmitted through various materials. (MS.1.9.a)

Physical Science				
	Emerging	**Approaching Target**	**At Target**	**Advanced**
		Identify waves as a carrier of information. (MS.1.10.a)	Use information to identify that digitized signals are a reliable way to encode and transmit information. (MS.1.10.a)	Use information to support the claim that digitized signals are a reliable way to encode and transmit information. (MS.1.10.a)

Life Science				
	Emerging	**Approaching Target**	**At Target**	**Advanced**
PG 5.	**Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how individual organisms are configured and how these structures function to support life, growth, behavior, and reproduction.**			
GLE 2.1, 2.2, 2.3, 2.4	Identify a cell as the smallest living part of a living thing. (MS.2.1.a)	Identify the tools, instruments, or methods that can be used to see or learn about cells. (MS.2.1.a)	Identify how an investigation could show that living things are made of one or more cells. (MS.2.1.a)	Use evidence from an investigation to show that living things are made of one or more cells. (MS.2.1.a)
	Identify that all plants and animals are made up of cells. (MS.2.1.b)	Use a model to identify one major component of a plant or animal cell. **OR** Identify the primary roles of one major component of a plant or animal cell. (MS.2.1.b)	Use a model to identify at least three major components of a plant or animal cell. **OR** Identify the primary roles of at least three major components of a plant or animal cell. (MS.2.1.b)	Develop or use a model to identify three major components of a plant or animal cell and the primary role of each component. (MS.2.1.b)
	Identify that an organ is made up of cells. (MS.2.1.c)	Identify that the major organs that make up a specific system are made up of cells. (MS.2.1.c)	Use evidence to show that major organs are made up of cells. **OR** Identify how the major organs that make up specific systems interact and are made up of cells. (MS.2.1.c)	Use evidence to show that the major organs that make up specific systems interact and are made up of cells. (MS.2.1.c)
		Identify how characteristic animal behaviors and specialized plant structures help them survive. (MS.2.2.a)	Identify how characteristic animal behaviors and specialized plant structures help them survive and reproduce in a given environment. (MS.2.2.a)	Use evidence to show that characteristic animal behaviors and specialized plant structures help them survive and reproduce in a given environment. (MS.2.2.a)
		Identify an environmental factor that influences the growth of an organism. (MS.2.2.b)	Identify how an organism's growth is influenced by an environmental factor. (MS.2.2.b)	Use data to show how different environmental factors influence the growth of organisms. (MS.2.2.b)
	Identify light, carbon dioxide, or water as a necessary input into photosynthesis. (MS.2.3.a)	Identify that photosynthesis needs the input of matter and energy. (MS.2.3.a)	Identify how photosynthesis plays a role in the cycling of matter and the flow of energy between plants and animals. (MS.2.3.a)	Explain how photosynthesis plays a role in the cycling of matter and the flow of energy between plants and animals. (MS.2.3.a)

Life Science				
	Emerging	**Approaching Target**	**At Target**	**Advanced**
	Identify food as a source of matter and energy for growth. (MS.2.3.b)	Use a model to identify the flow of matter and energy used for growth. (MS.2.3.b)	Use a model to show how food supports growth and releases energy in an organism. (MS.2.3.b)	Develop a model to show how food supports growth and releases energy in an organism. (MS.2.3.b)
	Identify that organisms sense and respond to information (stimuli). (MS.2.4.a)	Use information to identify that the nervous system is involved in the processing of information and formation of memories. **OR** Identify that organisms detect, process, and use information for immediate use or to store information as a memory. (MS.2.4.a)	Use information to identify that organisms detect, process, and use information via the nervous system for immediate use or to store information as a memory. (MS.2.4.a)	Use information to identify how organisms detect, process, and use information via the nervous system for immediate use or to store information as a memory. (MS.2.4.a)
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 2.5, 2.6, 2.7	Identify that an individual organism is helped or hurt by the availability of a resource. (MS.2.5.a)	Identify how a change in environmental conditions such as resource availability can affect an individual organism. (MS.2.5.a)	Identify how a change in environmental conditions such as resource availability can affect organisms and populations in an ecosystem. (MS.2.5.a)	Use data to identify how a change in environmental conditions such as resource availability can affect organisms and populations in an ecosystem. (MS.2.5.a)
		Identify an example of competitive, predatory, and mutually beneficial relationships between organisms. (MS.2.5.b)	Identify an example of competitive, predatory, and mutually beneficial relationships between organisms in at least three different ecosystems. (MS.2.5.b)	Explain the differences between competitive, predatory, and mutually beneficial relationships between organisms in at least three different ecosystems. (MS.2.5.b)

Life Science				
	Emerging	**Approaching Target**	**At Target**	**Advanced**
	Identify that living things receive inputs of matter and energy. (MS.2.6.a)	Use a model to identify an input of matter or energy into a living thing. **OR** Identify an example of the cycling of matter and energy among living and nonliving parts of an ecosystem. (MS.2.6.a)	Use a model to identify an example of how matter and energy are cycled among living and nonliving parts of an ecosystem. (MS.2.6.a)	Develop a model to show how matter and energy are cycled among living and nonliving parts of an ecosystem. (MS.2.6.a)
		Identify an effect on a population from a change in a physical or biological component of an ecosystem. (MS.2.7.a)	Identify examples of how changes to physical or biological components of an ecosystem affect populations. (MS.2.7.a)	Use evidence to show how changes to physical or biological components of an ecosystem affect populations. (MS.2.7.a)
	Identify that the health of an ecosystem can change when the system is disturbed. (MS.2.7.b)	Identify how a design solution maintains the health of an ecosystem in the face of a disruption to a physical or biological component of the system. (MS.2.7.b)	Compare the economic costs, social considerations, or scientific constraints of two design solutions for maintaining the health of an ecosystem in the face of a disruption to a physical or biological component of the system. (MS.2.7.b)	
PG 7.	**Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how genetic and environmental factors influence variation of organisms across generations.**			
GLE 2.8		Identify genes as things that change to result in harmful, beneficial, or neutral effects for an organism. (MS.2.8.a)	Use a model to identify that structural changes to genes (mutations) result in harmful, beneficial, or neutral effects for an organism. (MS.2.8.a)	Develop a model of how structural changes to genes (mutations) result in harmful, beneficial, or neutral effects for an organism. (MS.2.8.a)

Life Science				
	Emerging	**Approaching Target**	**At Target**	**Advanced**
	Identify that offspring have similar characteristics to their parents. (MS.2.8.b)	Use a model to identify that organisms with similar characteristics are related. **OR** Identify whether an organism is genetically related to the previous generation. (MS.2.8.b)	Use a model to identify that the genetic characteristics of a generation produced by asexual or sexual reproduction relate to the previous generation. (MS.2.8.b)	Develop a model to show how the genetic characteristics of a generation produced by asexual or sexual reproduction relate to the previous generation. (MS.2.8.b)
PG 8.	**Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how natural selection drives biological evolution, accounting for the unity and diversity of organisms.**			
GLE 2.9, 2.10		Identify that fossils are evidence of organisms that lived in the past. (MS.2.9.a)	Identify patterns in the fossil record that show changes in the level of complexity of anatomical structures in organisms and the chronological order of fossil appearance in the rock layers. **OR** Use data to identify that the fossil record shows changes in the level of complexity of anatomical structures in organisms and that layering of fossils reveals their chronological order of appearance. (MS.2.9.a)	Use data to identify at least three examples of patterns in the fossil record that show changes in the level of complexity of anatomical structures in organisms and the chronological order of fossil appearance in the rock layers. (MS.2.9.a)
	Identify that two modern organisms with similar structures are likely more closely related than those without similar structures. (MS.2.9.b)	Identify that fossils are evidence of organisms that lived in the past. (MS.2.9.b)	Identify patterns of similarities and differences among modern organisms and fossil organisms. (MS.2.9.b)	Use scientific information to explain that patterns of similarities and differences among modern organisms and fossil organisms are because of evolutionary relationships. (MS.2.9.b)
		Identify that an embryo eventually develops into a recognizable organism. (MS.2.9.c)	Use a display of pictorial data to compare patterns of embryonic characteristics across multiple species. (MS.2.9.c)	Use a display of pictorial data to compare embryonic development patterns across multiple species. (MS.2.9.c)

Life Science				
	Emerging	**Approaching Target**	**At Target**	**Advanced**
	Identify that an individual organism is helped or hurt by one of its traits. (MS.2.10.a)	Identify that variations of traits in populations increase some individuals' probability of surviving and reproducing. (MS.2.10.a)	Identify how variations of traits in populations increase some individuals' probability of surviving and reproducing. (MS.2.10.a)	Explain how variations of traits in populations increase some individuals' probability of surviving and reproducing. (MS.2.10.a)
		Identify that some genetic variations give some individuals an advantage in surviving and reproducing. (MS.2.10.c)	Identify the relationship between genetic variations among individuals and advantages or disadvantages those individuals have for surviving and reproducing. (MS.2.10.c)	Use mathematical thinking to identify the relationship between genetic variations among individuals and advantages or disadvantages those individuals have for surviving and reproducing. (MS.2.10.c)
		Identify that natural selection works over many generations. (MS.2.11.a)	Identify the relationship between natural selection of genetic variations over many generations and the increase and decrease of specific traits in populations over time. (MS.2.11.a)	Use mathematical thinking to identify the relationship between natural selection of genetic variations over generations and the increase and decrease of specific traits in populations over time. (MS.2.11.a)
	Identify biodiversity as a measure of the health of an ecosystem. (MS.2.12.a)	Identify a solution for maintaining the biodiversity of an ecosystem. (MS.2.12.a)	Compare the economic costs, social considerations, or scientific constraints of two design solutions for maintaining the biodiversity of an ecosystem. (MS.2.12.a)	

Earth and Space Science				
	Emerging	**Approaching Target**	**At Target**	**Advanced**
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, 3.2	Identify that the appearance of Earth's moon changes, or Earth's seasons change, because of their relative positions. (MS.3.1.a)	Use a model of the Earth-Sun-moon system to identify that the appearance of Earth's moon changes, or Earth's seasons change, because of their relative positions. (MS.3.1.a)	Use a model of the Earth-Sun-moon system to show the cyclic patterns of the moon's common phases and Earth's seasons. (MS.3.1.a)	Develop a model of the Earth-Sun-moon system to show the cyclic patterns of the moon's common phases and Earth's seasons. (MS.3.1.a)
		Identify gravity as what keeps Earth and the moon in their orbits. (MS.3.1.b)	Use a model to identify the role of gravity in the orbital motions of Earth and the moon. (MS.3.1.b)	Use a model to demonstrate the role of gravity in the orbital motions of Earth and the moon. (MS.3.1.b)
		Identify gravity as what draws and holds together the matter making up Earth and the moon. (MS.3.2.a)	Use a model to identify the role of gravity in drawing and holding together the matter making up Earth and the moon. (MS.3.2.a)	Use a model to demonstrate the role of gravity in drawing and holding together the matter making up Earth and the moon. (MS.3.2.a)
	Identify that all solar system objects are affected by gravity. (MS.3.2.b)	Identify one similarity or one difference among solar system objects. (MS.3.2.b)	Use data to determine at least one similarity and one difference among solar system objects. (MS.3.2.b)	
	Identify that the appearance of Earth's moon changes, or Earth's seasons change, because of their relative positions. (MS.3.2.c)	Use a model of the Earth-Sun-moon system to identify that the appearance of Earth's moon changes, or Earth's seasons change, because of their relative positions. (MS.3.2.c)	Use a model of the Earth-Sun-moon system to describe a cyclic pattern in lunar phases, eclipses of the Sun and the moon, and Earth's seasons. (MS.3.2.c)	Develop or use a model of the Earth-Sun-moon system to compare the different cyclic patterns of lunar phases, eclipses of the Sun and the moon, and Earth's seasons. (MS.3.2.c)
PG 10.	**Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how and why Earth is constantly changing.**			
GLE 3.3, 3.4, 3.5, 3.6, 3.7		Identify that rock strata can be used to establish relative ages in Earth's history. (MS.3.3.a)	Identify evidence that supports the scientific explanation that rock strata can be used to establish relative ages in Earth's history. (MS.3.3.a)	Use evidence to support the identification of the relative ages of materials based on rock strata. (MS.3.3.a)

Earth and Space Science				
	Emerging	**Approaching Target**	**At Target**	**Advanced**
	Identify that heat energy from Earth's interior can change and form rocks. (MS.3.4.a)	Use a model to identify that the influence of the Sun's energy on the water cycle and the heat energy from Earth's interior can change and form rocks. (MS.3.4.a)	Use a model to identify that the influence of the Sun's energy on the water cycle and the heat energy from Earth's interior can act over time to change and form rocks. (MS.3.4.a)	Develop or use a model to show how the influence of the Sun's energy on the water cycle and the heat energy from Earth's interior can act over time to change and form rocks. (MS.3.4.a)
		Use scientific resources to identify a process that has changed Earth's surface. (MS.3.4.b)	Use scientific resources to identify fast and slow processes that have changed Earth's surface on global scales over time. (MS.3.4.b)	Use scientific resources to describe fast and slow processes that have changed Earth's surface on global scales over time. (MS.3.4.b)
		Use data to identify plate motions as the cause of ocean structure (ridges, fracture zones, and trenches). (MS.3.5.a)	Use data on the shape of continents, ocean structure (ridges, fracture zones, and trenches), and distribution of fossils to identify evidence of past plate motions. (MS.3.5.a)	Use data on the shape of continents, ocean structure (ridges, fracture zones, and trenches), and distribution of fossils to represent the phenomenon of plate motions. (MS.3.5.a)
	Identify a process that changes Earth's surface on a local scale over time. (MS.3.6.a)	Identify the fast and slow processes that have changed Earth's surface on local scales over time. (MS.3.6.a)	Explain the fast and slow processes that have changed Earth's surface on local scales over time. (MS.3.6.a)	
	Identify a change that makes more water vapor, liquid water, or ice. (MS.3.6.b)	Identify how the state of water changes at one stage of the water cycle. (MS.3.6.b)	Use a model to identify how the state of water changes as it moves through the water cycle. (MS.3.6.b)	Develop a model to show how the state of water changes as it moves through the water cycle. (MS.3.6.b)
	Identify how the state of water changes when rain or snow forms. (MS.3.6.c)	Identify that the motion and interaction of air masses cause changes in weather conditions. (MS.3.6.c)	Use data to provide evidence that the motion and interaction of air masses cause changes in weather conditions. (MS.3.6.c)	Use data to identify how the motion and interaction of air masses cause changes in weather conditions. (MS.3.6.c)

Earth and Space Science				
	Emerging	**Approaching Target**	**At Target**	**Advanced**
	Identify that a location's climate is affected by the location's latitude, elevation, and proximity to oceans. (MS.3.6.d)	Identify a location's climate based on the location's latitude, elevation, and proximity to oceans. **OR** Use a model to identify two locations of similar or different climates. (MS.3.6.d)	Use a model to identify how the latitude, elevation, and proximity to oceans of a location determines the location's climate. (MS.3.6.d)	Develop a model to show how the latitude, elevation, and proximity to oceans of a location determines the location's climate. (MS.3.6.d)
	Identify how the state of water changes when rain or snow forms. (MS.3.7.a)	Identify that the motion and interaction of air masses can cause severe weather. (MS.3.7.a)	Use evidence from an investigation to identify how the motion and interaction of air masses cause severe weather. (MS.3.7.a)	Plan an investigation to identify how the motion and interaction of air masses cause severe weather. (MS.3.7.a)
	Identify that a region's climate is affected by the region's landforms and latitude. (MS.3.7.b)	Identify a regional climate based on the region's landforms and latitude. (MS.3.7.b)	Use a system model to identify different regional climates related to the Coriolis Effect, different landforms, and unequal heating due to latitude. (MS.3.7.b)	Develop a system model to identify different regional climates related to the Coriolis Effect, different landforms, and unequal heating due to latitude. (MS.3.7.b)
PG 11.	**Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how human activities and Earth's surface processes interact.**			
GLE 3.9, 3.10	Identify that humans depend on limited resources from Earth. (MS.3.8.a)	Use scientific resources to identify evidence of how Earth's resources are limited and uneven. **OR** Identify that Earth's resources are limited and uneven as a result of geoscience processes. (MS.3.8.a)	Use scientific resources to identify evidence of how Earth's resources are limited and uneven as a result of geoscience processes. (MS.3.8.a)	
	Identify that humans need to prepare for natural hazards. (MS.3.9.a)	Use data to identify how some natural hazards can be predicted, prepared for, and mitigated. (MS.3.9.a)	Use patterns in data to show how some natural hazards can be predicted, prepared for, and mitigated. (MS.3.9.a)	

Earth and Space Science				
	Emerging	**Approaching Target**	**At Target**	**Advanced**
	Identify that a human activity can affect the environment. (MS.3.10.a)	Identify how a human activity is likely to affect the environment. (MS.3.10.a)	Identify a solution to an environmental problem caused by humans in order to minimize the impact of the problem. (MS.3.10.a)	Develop a solution to an environmental problem caused by humans in order to minimize the impact of the problem. (MS.3.10.a)
	Identify that humans use natural resources. (MS.3.10.b)	Identify that use of natural resources is likely to increase with an increase in human population. (MS.3.10.b)	Use data to identify the effect of increases in human population and the use of natural resources on Earth's systems. (MS.3.10.b)	Use data to explain or predict the effect of increases in human population and the use of natural resources on Earth's systems. (MS.3.10.b)