***General MCAS Achievement Level Descriptors***

**Exceeding Expectations**   
A student who performed at this level exceeded grade-level expectations by demonstrating mastery of the subject matter.

**Meeting Expectations**  
A student who performed at this level met grade-level expectations and is academically on-track to succeed in the current grade in this subject.

**Partially Meeting Expectations**A student who performed at this level partially met grade-level expectations in this subject. The school, in consultation with the student’s parent/guardian, should consider whether the student needs additional academic assistance to succeed in this subject.

**Not Meeting Expectations**A student who performed at this level did not meet grade-level expectations in this subject. The school, in consultation with the student’s parent/guardian, should determine the coordinated academic assistance and/or additional instruction the student needs to succeed in this subject.

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations,* and *Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

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|  | **Partially Meeting Expectations  *On MCAS, a student at this level:*** | **Meeting Expectations  *On MCAS, a student at this level:*** | **Exceeding Expectations  *On MCAS, a student at this level:*** |
| **Understanding and Application of Disciplinary Core Ideas** | Demonstrates a partial understanding of some scientific concepts and processes by identifying and sometimes describing or providing evidence for these concepts and processes.  Uses some basic scientific terms in common scientific examples. | Demonstrates a solid understanding of many scientific concepts and processes by mostly describing, explaining, and providing evidence for these concepts and processes.  Mostly applies appropriate scientific terms in a variety of applications, including common science examples and some novel situations. | Demonstrates a comprehensive, in-depth understanding of many scientific concepts and processes by consistently describing, explaining, and providing evidence for these concepts and processes.  Consistently applies scientific terms in appropriate contexts in both common science examples and many novel situations. |
| **Understanding and Application of Scientific and Engineering Practices** | Identifies a testable, scientific question for an investigation.  Completes a simple, commonly used model.  Uses simple graphs or data to draw general conclusions about a familiar scientific investigation or phenomena.  Identifies evidence to support a claim.  Describes a benefit or drawback of simple design features given a familiar device or prototype. | Develops some testable, scientific questions for an investigation.  Completes or uses a model and describes some strengths and weaknesses of the model.  Analyzes multiple sources of data, including graphs and tables, to draw conclusions about a familiar scientific investigation or phenomena.  Provides some evidence to support a claim and constructs basic explanations for scientific phenomena or results from an investigation.  Analyzes design features of a familiar device or prototype and describes a benefit or drawback of the design. | Consistently develops testable, scientific questions for an investigation.  Creates a model, consistently describes the strengths and weaknesses of the model, and provides information for how to improve the model.  Analyzes multiple sources of data, including graphs and tables, to draw conclusions about a novel or complex scientific investigation or phenomena.  Provides several pieces of evidence to support a claim and constructs thorough explanations for scientific phenomena or results from an investigation.  Analyzes design features of a novel device or prototype and constructs an explanation for how the design features meet criteria for success or are limited by constraints. |

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations,* and *Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

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| **Earth and Space Science** | **Partially Meeting Expectations**  ***On MCAS, a student at this level:*** | **Meeting Expectations**  ***On MCAS, a student at this level:*** | **Exceeding Expectations**  ***On MCAS, a student at this level:*** |
| **ESS1. Earth’s Place in the Universe** | Identifies the Sun, the Moon, and Earth in a model.  Recognizes that the Sun is a star.  Recognizes that people at different locations on Earth may experience day and night at the same time.  Given a pattern of moon phases, selects the Moon phase that completes the pattern.  Recognizes that shadows change over the course of a day because of the apparent movement of the Sun.  Supports a claim with evidence that an environment has changed over time, such as a forested area that was once covered by water.  Classifies whether geologic structures were formed by erosion or deposition. | Completes a model of the Sun, the Moon, and Earth and mostly describes the movements of each.  Recognizes that the Sun is the only star in our solar system.  Constructs an explanation for why people on Earth experience day and night.  Describes how the Moon reflects the Sun’s light and makes a pattern over approximately one month.  Uses a model to show the pattern of the Moon over a week or a month.  Completes a model showing the relationship between a shadow’s length and the position of the Sun in the sky.  Generally describes the processes of erosion or deposition.  Identifies the relative age of rock layers based on the position of the rock layers. | Develops a model of the Sun, the Moon, and Earth and consistently describes the movements of each.  Explains why the Sun appears brighter than other stars.  Constructs an explanation with evidence for why people at one location on Earth are experiencing day while people at another location on Earth are experiencing night.  Explains how the Moon’s reflection of the Sun’s light and the orbit of the Moon are responsible for the phases of the Moon.  Constructs an explanation for why the length and direction of a shadow changes during a day.  Constructs an explanation with evidence of how erosion and deposition can change geologic structures or an area over time. |

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| **ESS2. Earth’s Systems** | Uses weather data tables or simple graphs to describe one of the following: precipitation, wind speed, or temperature for an area.  Differentiates between two different types of climate.  Completes a simple model of the water cycle.  Identifies on a map where a volcano or earthquake is likely to occur.  Recognizes evidence of weathering or erosion in a diagram or simple description.  Interprets simple graphs to draw general conclusions about the relative amounts of fresh and salt water on Earth. | Analyzes simple weather data patterns to describe expected weather for an area.  Analyzes climate data for several different regions and describes differences in weather patterns. Recognizes that different regions can have different climate types.  Completes a model of the water cycle and describes what is happening in most of the water cycle stages.  Analyzes a map to locate where mountain ranges, ocean trenches, volcanoes, and earthquakes are likely to occur.  Describes the processes of weathering and erosion and applies them to common examples, such as landslides, canyons, valleys, etc.  Analyzes a map to identify water sources as fresh or salt water, including fresh water stored in glaciers and polar ice caps. | Analyzes and interprets graphs and tables to draw conclusions about various weather patterns.  Explains the difference between weather and climate and uses climate data to draw conclusions about the expected weather patterns of different climate types (e.g., desert, tropical, tundra).  Develops a model of the water cycle, including absorption and surface runoff, and describe how heat energy is needed for water to cycle.  Explains why mountain ranges, ocean trenches, volcanoes, and earthquakes occur at plate boundaries.  Explains how landscapes change due to weathering and erosion and provides examples of each process.  Describes different sources of fresh water and salt water and explains why it is important to understand the relative amounts of these types of water on Earth. |
| **ESS3. Earth and Human Activity** | Categorizes some common examples of renewable and nonrenewable energy resources.  Identifies one way to reduce human impact on the environment for a given situation.  Identifies one design solution to reduce the impact of a weather event, such as a hurricane, or other natural event, such as an earthquake, on humans.  Identifies a testable question about a filter to determine how well the filter will work. | Explains why some sources of energy are considered renewable and others are not.  Consistently categorizes energy sources as either renewable or nonrenewable.  Describes different ways to reduce human impact on the environment for a given situation.  Identifies multiple design solutions to reduce the impact of a weather event or other natural event on humans.  Develops a testable question about how to improve the design of a filtering system and provides information about how to answer the question. | Explains how humans have impacted the environment in different ways and constructs explanations for how to reduce those impacts on the environment.  Identifies multiple design solutions to reduce the impact of a weather event or other natural event on humans and explains how each design solution could reduce the impact.  Develops testable questions about how to make several improvements to the design of a filtering system and provides evidence for how the improvements will better filter the water. |

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| **Life Science** | **Partially Meeting Expectations**  ***On MCAS, a student at this level:*** | **Meeting Expectations**  ***On MCAS, a student at this level:*** | **Exceeding Expectations**  ***On MCAS, a student at this level:*** |
| **LS1. From Molecules to Organisms: Structures and Processes** | Completes a model of an organism’s life cycle and describes the importance of one stage of the life cycle.  Supports a claim with evidence about how the function of an animal or plant structure helps the animal or plant to survive.  Recognizes that photosynthesis is important for the survival of a plant. | Compares the life cycles of two organisms and describes similarities between the two life cycles, including the importance of some of the stages.  Supports claims with evidence about how different functions of animal or plant structures helps the animal or plant to survive.  Completes a model showing some of the inputs (sunlight, air, water) and outputs (sugars) of photosynthesis. | Constructs an explanation for why each stage of the life cycle is important, using examples of both plants and animals.  Supports claims with evidence about how several structures of animals and plants allow for the survival, growth, and reproduction of different organisms.  Develops a model showing the inputs and outputs of photosynthesis and explains the importance of photosynthesis for the survival and growth of a plant. |
| **LS2. Ecosystems: Interactions, Energy, and Dynamics** | Analyzes a simple food web or other model and identifies the ecological role of some of the organisms.  Recognizes that the energy organisms depend on originates from the Sun.  Describes one way animals and plants use energy.  Identifies the function of a composter and one design element of a composter.  Identifies a type of organism (bacteria or fungi) that breaks down dead organisms. | Analyzes a food web or other model, identifies the ecological roles of several of the organisms, and describes some of the roles of the organisms.  Analyzes a model and describes the flow of energy through a simple food web.  Analyzes several composter designs and describes some advantages and disadvantages of each design.  Describes the importance of decomposers in recycling matter back to the soil. | Analyzes food webs and other models and consistently describes the ecological roles of the organisms.  Creates a model to show energy transfer through a food web and describes how energy is transferred from one organism to another.  Analyzes several composter designs, describes several advantages and disadvantages of each, and explains which composter is best to use.  Explains what would happen to an ecosystem without decomposers, and explains how decomposers recycle matter back into both the soil and air. |
| **LS3. Heredity: Inheritance and Variation of Traits** | Provides observable evidence that traits are inherited from a parent.  Recognizes that some basic characteristics are inherited, while others are a result of the environment. | Analyzes data and draws some conclusions about familiar traits that are inherited and characteristics that are a result of the environment. | Analyzes novel data and draws conclusions about traits that are inherited and characteristics that are a result of the environment. |
| **LS4. Biological Evolution: Unity and Diversity** | Identifies the type of environment where an organism once lived based on fossilized remains.  Supports a claim with one piece of evidence for how some individuals within a population may have a survival advantage over other individuals in the population.  Uses evidence, such as an organism’s structure, to describe how an organism is well adapted to its environment.  Recognizes what may happen to an organism if its environment changes and it is unable to move away. | Classifies fossils based on their physical characteristics, including the type of environment where the fossilized organism once lived.  Supports a claim with several pieces of evidence for how some individuals within a population may have a survival advantage over other individuals in the population.  Identifies an example of how an organism is well adapted to its environment.  Describes what will happen to a population if individuals within that population are unable to reproduce. | Constructs an explanation for why the fossil record is incomplete due to many organisms not being fossilized.  Given data about the characteristics of a novel organism, draws conclusions and explains how the organism is well adapted to its environment.  Explains, with evidence, if an organism is likely to survive environmental changes.  Explains why reproduction is critical to the survival of a species. |

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| **Physical Science** | **Partially Meeting Expectations**  ***On MCAS, a student at this level:*** | **Meeting Expectations**  ***On MCAS, a student at this level:*** | **Exceeding Expectations**  ***On MCAS, a student at this level:*** |
| **PS1. Matter and Its Interactions** | Analyzes a simple particle model of matter and identifies the phase of the substance.  Completes a graph to show the masses of substances after a phase change or after a chemical reaction.  Analyzes a simple set of data to determine the best material to use in a common situation, based on the material’s characteristic properties.  Determines if a chemical reaction occurred or if a mixture was formed during an investigation and provides one piece of evidence to support the claim. | Analyzes a particle model of a substance before and after a phase change to determine phases of the substance and the phase change that occurred.  Constructs an explanation about how mass is conserved during a phase change or a chemical reaction.  Analyzes a set of data about materials, identifies the best material to use in a given situation, and provides evidence for the reasoning.  Develops a question to determine if a chemical reaction occurred or if a mixture was formed during an investigation and provides possible answers to the question with pieces of evidence to support the answers. | Analyzes particle models of substances before and after phase changes to determine the phase change that occurred and describes whether heat was added or removed.  Describes an investigation that could be used to show that mass is conserved during a phase change or chemical reaction.  Analyzes multiple sets of data to determine the best materials to use in a variety of different situations, based on the material’s characteristic properties. Supports the conclusions with evidence from the data.  Describes an investigation that could be used to determine if a chemical reaction will occur or if a mixture will be formed when two substances are combined and includes information about evidence that would be needed to make the determination. |
| **PS2. Motion and Stability: Forces and Interactions** | Interprets a diagram to determine if balanced forces are acting on an object.  Labels a model showing the direction of the gravitational force on an object on Earth.  Identifies if two magnets will be attracted to each other or repelled from each other based on the magnets’ orientations.  Recognizes that either an attractive or a repulsive force exists between two magnets. | Determines if the motion of an object will change, based on a diagram showing the forces acting on the object.  Describes how friction affects the motion of an object.  Completes a model showing the direction of the gravitational force on multiple objects that are on or near the surface of Earth.  Completes a model of the poles on several magnets based on whether the magnets attract each other or repel each other. | Completes a diagram of the forces acting on an object based on whether the object is at rest, moving at a constant speed, or changing speed and explains the reasoning.  Describes how different surface textures affect friction.  Constructs an explanation about the gravitational force exerted by Earth on objects always being toward the center of Earth.  Describes an investigation that could be used to determine the poles of magnets and explains what evidence could be used to make this determination. |
| **PS3. Energy** | Interprets a graph that shows the relationship between speed and kinetic energy.  Identifies one type of energy that is produced when a collision occurs.  Describes one way that energy can be moved from one place to another.  Interprets a familiar situation to describe one way that stored energy is converted to another type of energy. | Describes the relationship between the speed of an object and the kinetic energy of that object.  Describes the energy conversions that take place when two objects collide.  Interprets a given scenario and describes one way that energy is transferred in the scenario.  Describes two energy conversions in a given situation including kinetic energy being converted to electrical energy and/or stored energy being converted into another type of energy. | Completes a graph showing the kinetic energy of object as the speed of the object changes and explains why the graph should be completed in that way.  Constructs an explanation about the energy conversions that take place when two objects collide and supports the explanation with evidence.  Analyzes a novel scenario and describes multiple ways that energy is transferred from place to place and how energy is converted in multiple ways. |
| **PS4. Waves and Their Applications in Technologies for Information Transfer** | Recognizes that waves can cause an object to move.  Uses a simple model of a wave to show that the wave has a regular pattern.  Recognizes that light must be reflected off an object and enter the eye for the object to be seen.  Given a communication system, identifies one component (encoder, decoder, receiver, sender) of the system. | Generally describes that waves carry energy and can cause objects to move.  Completes a model showing that a wave has a regular pattern of motion.  Develops a model to show how light reflects off an object and enters the eye so the object can be seen.  Describes at least two components of a given communication system. | Constructs an explanation about how an object can be moved by the energy of a wave.  Explains how objects are seen by the eye, using evidence from a given scenario.  Consistently describes the components of a communication system for a given scenario. |

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| **Technology/ Engineering** | **Partially Meeting Expectations**  ***On MCAS, a student at this level:*** | **Meeting Expectations**  ***On MCAS, a student at this level:*** | **Exceeding Expectations**  ***On MCAS, a student at this level:*** |
| **ETS1. Engineering Design**  **and**  **ETS3. Technological Systems** | Identifies a criterion for success and a constraint when given a simple design problem.  Identifies one solution to a simple engineering design problem.  Analyzes different representations of a simple design solution and chooses the most appropriate one for a given situation.  Identifies the importance of a prototype.  Identifies the difference between an innovation and an invention. | Describes several criteria for success and constraints when given a design problem.  Generates a solution to an engineering design problem and generally explains how the solution could be successful based on evidence.  Analyzes different representations of a design solution, chooses the most appropriate representation for the given situation, and explains the reasoning.  Identifies several design features of a prototype and explains how these features are important to the design of the prototype.  Analyzes a design feature of a prototype and explains the importance of a prototype.  Describes one innovation to an existing technology.  Provides an example of an invention, including common examples and some novel examples. | Explains how certain criteria for success and constraints will impact the solution to a design problem.  Generates two or more solutions to an engineering design problem and explains in detail how the solutions could be successful, and identifies possible failure points for each solution.  Describes an appropriate representation for a design solution and explains the reasoning.  Describes several design features of prototypes and explains the benefits and possible limitations of each.  Explains why prototypes are constructed and explains the importance of redesigning a prototype.  Explains why a novel technology is an innovation or an invention, given a description of the technology. |