

Middle School				
Students that are a level____may be able to do things like...	1	2	3	4
Earth Science				
ESS1: Earth's Place in the Universe	Identify components of a model that measures and collects evidence that explains the similarities and differences in the patterned motions of the Sun-Earth- Moon system, the scale of objects in the solar system, and the role of gravity in the motion of galaxies and the solar system	Use a model or graphical display to identify data from tables and other graphical displays that can be used as pieces of evidence to describe the patterned motions of the Sun-Earth-Moon system, the scale of objects in the solar system, and the role of gravity in the motion of galaxies and the solar system.	Develop and use a model using graphical displays of data that can be used as pieces of evidence to explain the patterned motions of the Sun-Earth-Moon system, the scale of objects in the solar system, and the role of gravity in the motion of galaxies and the solar system.	Evaluate and revise a model based on constraints and data limitations that explain the patterned motions of the Sun-Earth-Moon system, the scale of objects in the solar system, and the role of gravity in the motion of galaxies and the solar system.
ESS2: Earth's Systems	Make measurements and/or observations from graphical data to help identify the components of a model that help explain the patterns in the flow or cycles of energy and matter throughout Earth's systems, including the sun and Earth's interior as primary energy sources; and identify evidence to explain that Earth's processes have changed Earth's surface at varying spatial and time scales.	Use a model or investigation to identify patterns from bar graphs, pictographs, and other graphical data that supports an explanation for how energy and matter flow or cycle throughout Earth's systems, including the sun and Earth's interior as primary energy sources; and organize evidence to explain how Earth's processes have changed Earth's surface at varying spatial and time scales.	Analyze data from an investigation to develop and use a model that shows patterns in the flow or cycles of energy and matter throughout Earth's systems, including the sun and Earth's interior as primary energy sources; and interpret evidence to construct an explanation that supports how Earth's processes have changed Earth's surface at varying spatial and time scales.	Evaluate and revise a model to generate data that supports an explanation that shows patterns in how energy and matter flow or cycle throughout Earth's systems, including the sun and Earth's interior as primary energy sources; and evaluate the impact of new data by predicting how Earth's processes will change Earth's surface at varying spatial and time scales if a new variable is introduced.

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ESS3: Earth and Human Activity	Identify scientific questions using collected and/or graphically represented evidence regarding the dependency of humans on the environment for different natural resources and identify evidence that can help design a simple solution that minimizes the effect of humans on the environment or explain the observed patterns that emerge between natural hazards and their related geological forces.	Ask questions to clarify evidence about data or apply scientific principles about the uneven distribution of natural resources and human dependence on those resources to design a simple solution that minimizes the effect of humans on the environment and explain the patterns in the history of natural hazards and their related geological forces.	Analyze and interpret sets of data regarding the uneven distribution of natural resources and human dependence on those resources to ask questions and design a solution that could minimize the effect of humans on the environment and explain the observable patterns seen in the data from the history of natural hazards and their related geological forces.	Evaluate sets of data regarding the uneven distribution of natural resources and human dependence on the environment for those resources to revise a question or modify a design solution that minimizes the effect of humans on the environment, revise an argument for the effect of humans on the environment, and predict future patterns of natural hazards when considering the impact of humans on the environment.
Life Science				
LS1: From Molecules to Organisms: Structures and Processes	Organize information from an investigation to identify components of a model or support an argument using evidence to explain that all living things are made up of cells that work together to form more complex structures and systems, that both plants and animals convert energy into food sources but the process to do so is different, and that characteristic animal behaviors and specialized plant structures affect the probability of reproduction.	Conduct an investigation to support an argument using evidence and use a model to explain that all living things are made up of cells that work together to form more complex structures and systems, that both plants and animals convert energy into food sources but the process to do so is different, and that characteristic animal behaviors and specialized plant structures affect the probability of reproduction.	Plan and conduct an investigation and synthesize data to construct an argument using evidence and develop and use a model to explain that all living things are made up of cells that work together to form more complex structures and systems, that both plants and animals convert energy into food sources but the process to do so is different, and that characteristic animal behaviors and specialized plant structures affect the probability of reproduction.	Evaluate and revise a model or explanation using investigative data as evidence to construct a revised argument that all living things are made up of cells that work together to form more complex structures and systems, that both plants and animals convert energy into food sources but the process to do so is different, and that characteristic animal behaviors and specialized plant structures affect the probability of reproduction.

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LS2: Ecosystems: Interactions, Energy, and Dynamics	Identify components of a model to explain the dynamic relationships and interactions between the diverse types of living and nonliving parts of an ecosystem, including the flow of energy and the cycling of matter among biotic and abiotic components of an ecosystem, and organize multiple graphical displays of data to support a solution to mitigate disruptions to any part of an ecosystem by human access to natural resources.	Use a model to explain the dynamic relationships and interactions between the diverse types of living and nonliving parts of an ecosystem, including the flow of energy and cycling of matter among biotic and abiotic components, and organize data in multiple graphical displays to identify patterns which support a solution to mitigate disruptions to any part of an ecosystem by human access to natural resources.	Develop a model to explain and predict the dynamic relationships and interactions between the diverse types of living and nonliving parts of an ecosystem, including the flow of energy and cycling of matter among biotic and abiotic components, and analyze and interpret multiple graphical displays of data to design and evaluate a solution to mitigate disruptions of any part of an ecosystem by human access to natural resources.	Analyze and/or revise a model that explains and supports the dynamic relationships and interactions between the diverse types of living and nonliving parts of an ecosystem, including the flow of energy and the cycling of matter among biotic and abiotic components when a variable in the system is changed, and evaluate limitations of data to propose a revised solution to mitigate disruptions to any part of an ecosystem by human access to natural resources.
LS3: Heredity: Inheritance and Variation of Traits	Identify the components of a model that describes the relationship among variables that show why sexual and asexual reproduction may have different results of genetic variation in offspring and how complex and microscopic structural changes to genes (mutations) can be used to determine how they affect the structure and function of an organism.	Use or manipulate a model to represent cause and effect relationships to describe why sexual and asexual reproduction may have different results of genetic variation in offspring and how complex and microscopic structural changes to genes (mutations) can be analyzed to determine how they affect the structure and function of an organism.	Develop and use a model to describe the relationship among variables that show why sexual and asexual reproduction may have different results of genetic variation in offspring and how complex and microscopic structural changes to genes (mutations) can be analyzed to determine how they affect the structure and function of an organism.	Evaluate and revise a model that explains the relationship among variables as to why sexual/asexual reproduction may have different results of genetic variation in offspring and predicts what changes would occur in the function of an organisms if there is a mutation in the organism's genes.

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LS4: Biological Unity and Diversity	Identify evidence in data sets to show that a species has changed over time and identify scientific ideas to support an explanation for how humans influence the biodiversity of an area and how natural or artificial selection can give some organisms an advantage in survival and reproduction.	Organize and identify the patterns in large data sets to explain how species can change over time, communicate the similarities or differences found in past and present organisms or fossil records of past environmental conditions, and gather and use data to construct an explanation for how humans influence the biodiversity of an area, and how natural or artificial selection can give some organisms an advantage in survival and reproduction.	Analyze and interpret the patterns in large data sets to explain how species can change over time, communicate the similarities or differences found in past and present organisms or fossil records of past environmental conditions, and gather and synthesize data using mathematical representations to construct an explanation for how humans influence the biodiversity of an area, and how natural or artificial selection can give some organisms an advantage in survival and reproduction.	Evaluate and revise an explanation using large data sets that show the similarities or differences found in past and present organisms or fossil records of past environmental conditions and apply concepts of statistics and probability to form an explanation that as humans influence the biodiversity of an area, natural or artificial selection can give some organisms an advantage in survival and reproduction.
Physical Science				
PS1: Matter and Its Interactions	Identify the components of a model that explains the conservation of mass when two substances react; and identify data explaining that the properties of matter depend on its atomic and molecular composition and that particle motion changes when thermal energy in a system is changed.	Use a model to explain the conservation of mass when two substances react; and interpret data on the properties of matter to determine if a chemical reaction has occurred, such as the composition of atoms and molecules that make up matter and showing that particle motion changes when thermal energy in a system is changed.	Analyze patterns in graphical displays of data and develop and use a model to explain the conservation of mass when two substances react; and use the properties of matter to determine if a chemical reaction has occurred, including the composition of atoms and molecules that make up matter and showing that particle motion changes when thermal energy in a system is changed.	Evaluate and revise a model to explain the conservation of mass when two substances react; and use evidence to predict how changes to the molecular structure or thermal energy of matter can affect its properties.

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PS2: Motion and Stability: Forces and Interactions	Identify components of an investigation, and identify data regarding the relationships between mass, force, and motion, and the attractive and repulsive forces that act at a distance (electric, magnetic, and gravitational forces) that could be used to support a claim.	Identify questions, conduct an investigation, and organize and use data to make a claim regarding the relationships between mass, force, and motion, and the attractive and repulsive forces that act at a distance (electric, magnetic, and gravitational forces).	Ask questions, plan and conduct an investigation, and analyze and interpret data to make and support a claim regarding the relationships between mass, force, and motion, and the attractive and repulsive forces that act at a distance (electric, magnetic, and gravitational forces).	Evaluate and revise an investigation and analyze and evaluate data to predict and support a claim regarding the relationships between mass, force, and motion, and the attractive and repulsive forces that act at a distance (electric, magnetic, and gravitational forces).
PS3: Energy	Identify components of a model that investigates how kinetic and potential energy interact, transform, or transfer to another object; and collect and record data regarding the temperature and total energy of a system and its dependency on a variety of factors, including the types and states of matter, as well as the amount of matter involved.	Use a model to describe that kinetic and potential energy interact, transform, or transfer to another object; and interpret data regarding the temperature and total energy of a system and its dependence on a variety of factors, including the types and states of energy, as well as the amount of matter involved to support an argument.	Develop a model or investigation to construct an argument to support a claim about how kinetic and potential energy interact, transform, or transfer to another object; and analyze data from an investigation to provide evidence that the temperature and total energy of a system is dependent on a variety of factors, including the types and states of energy, as well as the amount of matter involved.	Evaluate and/or revise a model to predict changes to the interaction of kinetic and potential energy, including how energy is transformed or transferred to another object; and apply concepts of statistics and probability to construct an argument that the temperature and total energy of a system is dependent on a variety of factors, including the types and states of matter and the amount of matter involved.

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PS4: Waves and their Applications in Technologies for Information Transfer	Identify the mathematical components in a model to describe the patterns observed between wave characteristics and wave energy; and identify a claim with evidence to show that waves are reflected, absorbed, or transmitted through various materials.	Use mathematical representations in a model to describe the patterns observed between wave characteristics and wave energy; and support a claim with evidence to show that waves are reflected, absorbed, or transmitted through various materials.	Develop and use mathematical representations in a model to describe the patterns observed between wave characteristics and wave energy; and construct and evaluate a claim supported by evidence to show that waves are reflected, absorbed, or transmitted through various materials.	Evaluate and revise a mathematical model to predict patterns between wave characteristics and wave energy; and integrate qualitative, quantitative, and technical data to provide evidence to support a claim that waves are reflected, absorbed, or transmitted through various materials.