

Middle School Achievement Level Descriptors (ALDs)

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 Solar System	Identify components of a model that measures and collects evidence to explain the similarities and differences in the patterned motions of the Sun-Earth-Moon system, the role of gravity in the motion of galaxies and the solar system, or the relative occurrence of events in the Earth's and solar system's history.	Develop and/or use a simple model or graphical display to identify data from tables and other graphical displays that can be used as pieces of evidence to explain the patterned motions of the Sun-Earth-Moon system, the role of gravity in the motion of galaxies and the solar system, or the relative occurrences of events in the Earth's and solar system's history.	Develop and/or use a model using graphical displays of data that explain the patterned motions of the Sun-Earth-Moon system, the role of gravity in the motion of galaxies and the solar system, or the relative occurrence of events in the Earth's and solar system's history.	Evaluate and revise a model based on constraints and data limitations that explain the patterned motions of the Sun-Earth-Moon system, the role of gravity in the motion of galaxies and the solar system, or the relative occurrence of events in the Earth's and solar system's history.
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; <b>and</b> identify evidence to explain that Earth's processes have changed the Earth's surface at varying spatial and time scales.	Use a model or investigation to identify patterns from bar graphs, pictographs, and other various graphical data that supports how energy and matter flow or cycle throughout Earth's systems, including the sun and Earth's interior as primary energy sources; <b>and</b> organize evidence to explain how Earth's processes have changed the earth's surface at varying spatial and time scales.	Analyze data from an investigation to develop, use and/or revise 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; <b>and</b> interpret evidence to construct an explanation for how Earth's processes have changed the 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; <b>and</b> evaluate the impact of new data by predicting how the Earth's processes will change the 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 resources; <b>and</b> 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 about data or apply scientific ideas about the uneven distribution of natural resources and human dependence on the environment for those resources to design a simple solution that minimizes the effect of humans on the environment; <b>and</b> explain 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 the environment for 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.	Analyze and interpret sets of data regarding the uneven distribution of natural resources and human dependence on the environment for those resources to evaluate and revise a question that can modify a design solution that minimizes the effect of humans on the environment, explain the effect of humans on the environment and predicts future patterns of natural hazards when considering the impact of humans on the environment.
Life Science				

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<p>LS1: From Molecules to Organisms: Structure and Processes</p>	<p>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; both plants and animals convert energy into food sources but the process to do so is different; characteristic animal behaviors and specialized plant structures affect the probability of reproduction.</p>	<p>Gather and organize information from an investigation to support an argument using evidence and develop and/or use a simple model to explain that all living things are made up of cells that work together to form more complex structures and systems; both plants and animals convert energy into food sources but the process to do so is different; characteristic animal behaviors and specialized plant structures affect the probability of reproduction.</p>	<p>Gather and synthesize data from an investigation to engage in an argument using evidence and develop and/or use a model to explain that all living things are made up of cells that work together to form more complex structures and systems; both plants and animals convert energy into food sources but the process to do so is different; characteristic animal behaviors and specialized plant structures affect the probability of reproduction.</p>	<p>Evaluate and revise a model or explanation using investigative data as evidence to support an argument that all living things are made up of cells that work together to form more complex structures and systems; both plants and animals convert energy into food sources but the process to do so is different; characteristic animal behaviors and specialized plant structures affect the probability of reproduction.</p>
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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 organisms and abiotic components of an ecosystems; <b>and</b> 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.	Develop and/or use a simple 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; <b>and</b> 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 and/or use 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 a solution to mitigate disruptions fo 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; <b>and</b> evaluate limitations of data when analyzing and interpreting multiple graphical displays of data to design a solution to mitigate disruptions to any part of an ecosystem by human access to natural resources.
LS3: Heridity: Inheritance nd Variation of Traits	Identify the components of a model that describes the relationship among variables that show why sexual/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/or use a simple model to represent cause and effect relationships to describe either why sexual/asexual reproduction may have different results of genetic variation in offspring and why structural changes to genes (mutations) affect the structure and function of an organism.	Develop and/or use a model to describe the relationship among variables that show either why sexual/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 or 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 Evolution: Unity and Diversity	Identify evidence in data sets to show that a species has changed over time; <b>and</b> identify scientific ideas to support an explanation for how humans influence the biodiversity of an area, and 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 why species can change over time and communicate the similarities or differences found in past and present organisms or fossil records of past environmental conditions; <b>and</b> gather and use data to construct an explanation for how humans influence the biodiversity of an area, and 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 why species can change over time and communicate the similarities or differences found in past and present organisms or fossil records of past environmental conditions; <b>and</b> gather and synthesize data to construct an explanation for how humans influence the biodiversity of an area, and natural or artificial selection can give some organisms an advantage in survival and reproduction.	Analyze and evaluate 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; <b>and</b> apply concepts of statistics and probability (variability) 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.
<b>Physical Science</b>				
PS1: Matter and Its Interactions	Identify the components of a model that explains the conservation of mass and when two substances react the properties of matter are a function of the composition of atoms and molecules that make up matter, as well as the thermal energy.	Develop and/or use a simple model to explain the conservation of mass when two substances react; <b>and</b> interpret data on the properties of matter to determine if a chemical reaction has occurred such as function of the composition of atoms and molecules that make up matter, as well as the thermal energy.	Analyze patterns in graphical displays of data and develop and/or use a model to explain the conservation of mass when two substances react; <b>and</b> the use the properties of matter to determine if a chemical reaction has occurred such as function of the composition of atoms and molecules that make up matter, as well as the thermal energy.	Evaluate and revise a model to explain the conservation of mass when two substances react; <b>and</b> 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	Investigate a question by conducting an investigation, and identify data, regarding the relationship 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 relationship 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 relationship between mass, force, and motion, and the attractive and repulsive forces that act at a distance (electric, magnetic, and gravitational forces.)	Ask questions to conduct, evaluate, and revise an investigation; <b>and</b> analyze and evaluate data to predict and support a claim regarding the relationship 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; <b>and</b> collect and record data for an investigation that provides 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.	Develop and/or use a simple model to describe kinetic and potential energy interact, transform, or transfer to another object; <b>and</b> collect and record 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 and/or use 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; <b>and</b> 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; <b>and</b> apply concepts of statistics and probability when providing evidence to construct an argument that supports a claim that the temperature and total energy of a system is dependent on a variety of factors, including the types and states of matter, as well as 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; <b>and</b> select 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; <b>and</b> support a claim with evidence to show that waves are reflected, absorbed, or transmitted through various materials.	Develop and/or use mathematical representations in a model to describe the patterns observed between wave characteristics and wave energy; <b>and</b> construct 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; <b>and</b> integrate qualitative, quantitative, and technical data to provide evidence to support a claim that waves are reflected, absorbed, or transmitted through various materials.