

<p>Policy Level PLDs - General descriptors that provide overall claims about a student's performance in each performance level; used to broadly articulate the goals and rigor for the state's performance standards.</p>	<p>Students performing at the below basic level in science demonstrate minimal or no understanding of crosscutting concepts, disciplinary core ideas, and science and engineering practices to explain phenomena.</p>	<p>Students performing at the basic level in science inconsistently apply crosscutting concepts and disciplinary core ideas to explain phenomena. These students are able to implement science and engineering practices to a limited extent.</p>	<p>Students performing at the proficient level in science effectively apply crosscutting concepts, disciplinary core ideas, and science and engineering practices to explain phenomena and design solutions to problems.</p>	<p>Students performing at the advanced level in science effectively integrate crosscutting concepts, disciplinary core ideas, and science and engineering practices to explain phenomena and to design and evaluate solutions to problems.</p>
<p>Grade K PLDs</p>	<p>A Below Basic Student:</p>	<p>A Basic Student is able to:</p>	<p>A Proficient Student is able to:</p>	<p>In addition to Proficient, an Advanced Student is able to:</p>

Physical Science

PS1 Matter and its Interactions - Not present in Kindergarten

<p>PS2 Motion and Stability: Forces and Interactions</p>	<p>Demonstrates minimal or no ability to meet the standard.</p>	<p>Participate in an investigation to compare: different strengths/speeds and directions of pushes and pulls of an object.</p>	<ul style="list-style-type: none"> • With guidance, plan and conduct an investigation to compare: different strengths/speeds and directions of pushes and pulls of an object. • Analyze data from multiple tests to determine if a design solution changed the speed or direction of an object. 	<ul style="list-style-type: none"> • Plan and conduct an investigation to compare: different strengths/speeds and directions of pushes and pulls of an object. • Analyze data from multiple tests to determine if a design solution changed the speed or direction of an object. • Offer an alternate design solution after analyzing the data.
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<p>PS3 Energy</p>	<p>May be able to observe that sunlight warms the earth's surface.</p>	<ul style="list-style-type: none"> • Observe that sunlight warms the earth's surface. • Identify a structure that will reduce the warming effect of sunlight on an area. 	<ul style="list-style-type: none"> • Make observations to determine how patterns of sunlight warm the earth's surface. • Design and build a structure that will reduce the warming effect of sunlight on an area. 	<ul style="list-style-type: none"> • Explain how patterns of sunlight warm the earth's surface. • Design and build a structure that will reduce the warming effect of sunlight on an area. • Evaluate the effectiveness of the structure.
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PS4 Waves and their Applications in Technologies for Information Transfer - Not present in Kindergarten

Grade K PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Life Science				
LS1 From Molecules to Organisms: Structure and Processes	May be able to explain that plants and animals are different.	Explain that plants and animals have needs.	Use observations to describe the matter and energy which plants and animals need to survive.	<ul style="list-style-type: none"> Use observations to describe the matter and energy which plants and animals need to survive. Use observations to describe how matter and energy help plants and animals survive.
LS2 Ecosystems: Interactions, Energy, and Dynamics - Not present in Kindergarten				
LS3 Heredity: Inheritance and Variation of Traits - Not present in Kindergarten				
LS4 Biological Evolution: Unity and Diversity - Not present in Kindergarten				
Grade K PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Earth and Space Science				
ESS1 Earth's Place in the Universe - Not present in Kindergarten				
ESS2 Earth's Systems	May be able to: <ul style="list-style-type: none"> Name different types of weather. Recognize that plants and animals live in an environment. 	<ul style="list-style-type: none"> Identify local weather conditions. Identify that plants and animals change the environment. 	<ul style="list-style-type: none"> Use and share observations of local weather conditions to describe patterns over time. Use evidence to defend the claim that plants and animals can change the environment to meet their needs. 	<ul style="list-style-type: none"> Use and share observations of local weather conditions to describe patterns over time and use evidence to predict future weather patterns. Gather evidence to make the claim that plants and animals can change the environment to meet their needs.

Grade K PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
ESS3 Earth and Human Activity	May be able to: <ul style="list-style-type: none"> • Recognize local plants and animals. • Recognize severe weather. • Recognize humans interact with their environment. 	<ul style="list-style-type: none"> • Recognize plants and animals (including humans) live in unique places. • Ask questions about severe weather. • Identify the impact of humans on their environment. 	<ul style="list-style-type: none"> • Use a model to represent that plants and animals (including humans) live in places that meet their needs. • Ask questions to obtain information about how communities prepare for severe weather using weather forecasting. • Develop and share solutions that manage the impact of humans on their environment. 	<ul style="list-style-type: none"> • Analyze information to determine the best environment for a given plant or animal (including humans) to meet its needs. • Ask questions to obtain information and design solutions to minimize the impact of severe weather in local communities. • Evaluate solutions that manage the impact of humans on their environment.
Engineering and Design				
ETS1 Engineering, Technology, and Applications of Science	May be able to: <ul style="list-style-type: none"> • Make observations about a situation people want to change. • Identify an object in a simple sketch, drawing, or physical model. • Identify a problem. 	<ul style="list-style-type: none"> • Ask questions and make observations about a situation people want to change. • Explain a simple sketch, drawing, or physical model. • Use an object to solve a problem. 	<ul style="list-style-type: none"> • Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved. • Develop a simple sketch, drawing, or physical model. • Gather data to determine if an object solves a problem. 	<ul style="list-style-type: none"> • Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new object or tool. • Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function. • Analyze data from tests of two objects designed to solve the same problem to identify the strengths and weaknesses of how each performs.

Grade 1

WY-TOPP 2021+ SCIENCE PERFORMANCE LEVEL DESCRIPTORS (PLDs)

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<p>Grade 1 PLDs</p>	<p>A Below Basic Student:</p>	<p>A Basic Student is able to:</p>	<p>A Proficient Student is able to:</p>	<p>In addition to Proficient, an Advanced Student is able to:</p>
<p>Physical Science</p>				
<p>PS1 Matter and its Interactions - Not present in 1st grade</p>				
<p>PS2 Motion and Stability: Forces and Interactions - Not present in 1st grade</p>				
<p>PS3 Energy - Not present in 1st grade</p>				
<p>PS4 Waves and their Applications in Technologies for Information Transfer</p>	<p>May be able to:</p> <ul style="list-style-type: none"> • Observe that vibrating materials can make sound and that sound can make materials vibrate. • Recognize that it is easier to see in the light than in the dark. • Observe investigations to determine the effect of placing objects made with different materials in the path of a beam of light. • Use a device that uses light or sound to solve the problem of communicating over a distance. 	<ul style="list-style-type: none"> • Conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. • Observe that objects in darkness can be seen only when illuminated. • Conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light. • Build a device that uses light or sound to solve the problem of communicating over a distance. 	<ul style="list-style-type: none"> • Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. • Make observations to construct an evidence based account that objects in darkness can be seen only when illuminated. • Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light. • Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance. 	<ul style="list-style-type: none"> • Plan, conduct, and analyze investigations to provide evidence that different vibrating materials can make different sounds and that sound can make materials vibrate. • Investigate to construct an evidence based account that objects in darkness can be seen only when illuminated. • Plan, conduct, and analyze investigations to determine the effect of placing objects made with different materials in the path of a beam of light. • Use tools and materials to design and build a device(s) that uses light and sound to solve the problem of communicating over a distance.

Grade 1 PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Life Science				
LS1 From Molecules to Organisms: Structure and Processes	May be able to: <ul style="list-style-type: none"> Identify unique plant and animal parts. Make observations about the behaviors of different animals. 	<ul style="list-style-type: none"> Compare naturally occurring plant and animal parts to man made products that mimic them. Make observations about the behaviors of different animals and their offspring. 	<ul style="list-style-type: none"> Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs. Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. 	<ul style="list-style-type: none"> Use materials to design and test a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs. After reading texts and using media to determine patterns in behavior of parents and offspring that help offspring survive, compare patterns among different species.
LS2 Ecosystems: Interactions, Energy, and Dynamics - Not present in 1st grade				
LS3 Heredity: Inheritance and Variation of Traits	May be able to match parent to offspring.	Identify how parents and offspring are similar and different.	Make observations to construct an evidence based account that young plants and animals are like, but not exactly like, their parents.	After observing to construct an evidence based account that young plants and animals are like, but not exactly like, their parents, compare and contrast families or species.
LS4 Biological Evolution: Unity and Diversity - Not present in 1st grade				

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Grade 1 PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Earth and Space Science				
ESS1 Earth's Place in the Universe	May be able to: <ul style="list-style-type: none"> Identify sun, moon, and stars. Identify the seasons. 	<ul style="list-style-type: none"> Observe differences among the sun, moon, and stars. Recognize the amount of daylight can vary. 	<ul style="list-style-type: none"> Use observations of the sun, moon, and stars to describe patterns that can be predicted. Make observations at different times of year to relate the amount of daylight to the time of year. 	<ul style="list-style-type: none"> Read texts and use media to explain how patterns of the sun, moon, or stars are used by humans. Make observations how differing amounts of daylight at different times of year impact human behavior.
ESS2 Earth's Systems - Not present in 1st grade				
ESS3 Earth and Human Activity - Not present in 1st grade				
Engineering and Design				
ETS1 Engineering, Technology, and Applications of Science	May be able to: <ul style="list-style-type: none"> Ask questions and make observations about a situation people want to change. Explain a simple sketch, drawing, or physical model. Use an object to solve a problem. 	<ul style="list-style-type: none"> Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved. Develop a simple sketch, drawing, or physical model. Gather data to determine if an object solves a problem. 	<ul style="list-style-type: none"> Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new object or tool. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function. Analyze data from tests of two objects designed to solve the same problem to identify the strengths and weaknesses of how each performs. 	<ul style="list-style-type: none"> Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Grade 2

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<p>Grade 2 PLDs</p>	<p>A Below Basic Student:</p>	<p>A Basic Student is able to:</p>	<p>A Proficient Student is able to:</p>	<p>In addition to Proficient, an Advanced Student is able to:</p>

Physical Science

<p>PS1 Matter and its Interactions</p>	<p>May be able to:</p> <ul style="list-style-type: none"> • Describe the observable properties of materials. • Match a material to its intended purpose. • Make a large object out of a small set of pieces. • Identify the difference between heating and cooling. 	<ul style="list-style-type: none"> • Conduct an investigation to describe and classify different kinds of materials by their observable properties. • Choose a material for an intended purpose based on the properties. • Can disassemble a large object and make a new object from the same set of pieces. • Observe that some changes caused by heating cooling can be reversed and some cannot. 	<ul style="list-style-type: none"> • Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. • Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. • Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. • Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. 	<ul style="list-style-type: none"> • Explain why different properties are suited to different purposes. • Design and create a new product with specific material properties to solve a given problem. • Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object to solve a given problem. • Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot and explain that after a reversible change there can still be differences in an object.
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PS2 Motion and Stability: Forces and Interactions - Not present in 2nd grade				
PS3 Energy - Not present in 2nd grade				
PS4 Waves and their Applications in Technologies for Information Transfer - Not present in 2nd grade				
Grade 2 PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Life Science				
LS1 From Molecules to Organisms: Structure and Processes - Not present in 2nd grade				
LS2 Ecosystems: Interactions, Energy, and Dynamics	<p>May be able to:</p> <ul style="list-style-type: none"> Recognize that plants grow and have needs. Identify ways animals can either disperse seeds or pollinate plants. 	<ul style="list-style-type: none"> Conduct an investigation to determine if plants need sunlight and water to grow. Identify animals that can disperse seeds and pollinate plants. 	<ul style="list-style-type: none"> Plan and conduct an investigation to determine if plants need sunlight and water to grow. Develop a simple model that mimics the function of an animal in dispersing seeds and pollinating plants. 	<ul style="list-style-type: none"> Plan and conduct an investigation testing how variable amounts of sunlight and water affects plant growth. Develop a physical model that mimics the function of an animal in dispersing seeds and pollinating plants and evaluate the effectiveness of its function.
LS3 Heredity: Inheritance and Variation of Traits - Not present in 2nd grade				
LS4 Biological Evolution: Unity and Diversity	<p>May be able to make observations of plants or animals in a habitat.</p>	<p>Make observations of plants and animals in a habitat.</p>	<p>Make observations of plants and animals to compare the diversity of life in different habitats.</p>	<p>Make observations of plants and animals to compare the diversity of life in different habitats and explain how different characteristics help them survive in their habitats.</p>

Grade 2 PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Earth and Space Science				
ESS1 Earth's Place in the Universe	May be able to identify different Earth events.	Classify Earth events as either slow or quick.	Use information from several sources to provide evidence that Earth events can occur quickly or slowly.	Create a model to provide evidence that an Earth event can occur quickly or slowly.
ESS2 Earth's Systems	May be able to: <ul style="list-style-type: none"> • Recognize that wind or water can change the shape of the land. • Identify different kinds of land and bodies water. • Recognize that water is found on Earth. 	<ul style="list-style-type: none"> • Identify a solution designed to slow or prevent wind or water from changing the shape of the land. • Describe the shapes and kinds of land and bodies of water. • Recognize that water can exist in 3 phases: solid, liquid, and gas. 	<ul style="list-style-type: none"> • Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. • Develop a model to represent the shapes and kinds of land and bodies of water in an area. • Obtain information to identify where water is found on Earth and that it can be solid, liquid, or gas. 	<ul style="list-style-type: none"> • Evaluate multiple solutions to determine the most effective design that prevents wind or water from changing the shape of the land. • Explain how different types of land and bodies of water interact with each other. • Develop a model which shows how water travels and changes phases.
ESS3 Earth and Human Activity - Not present in 2nd grade				

Grade 2 PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Engineering and Design				
ETS1 Engineering, Technology, and Applications of Science	<p>May be able to:</p> <ul style="list-style-type: none"> • Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved. • Develop a simple sketch, drawing, or physical model. • Gather data to determine if an object solves a problem. 	<ul style="list-style-type: none"> • Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new object or tool. • Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function. • Analyze data from tests of two objects designed to solve the same problem to identify the strengths and weaknesses of how each performs. 	<ul style="list-style-type: none"> • Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. • Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. • Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. 	<ul style="list-style-type: none"> • Ask questions, make observations, and gather information about a situation people want to change to define a complex problem that can be solved through the development of a new or improved object or tool. • Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a self-generated problem. • Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs to determine which object best solves the problem.

Grade 3

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<p>Grade 3 PLDs</p>	<p>A Below Basic Student:</p>	<p>A Basic Student is able to:</p>	<p>A Proficient Student is able to:</p>	<p>In addition to Proficient, an Advanced Student is able to:</p>
<p>Physical Science</p>				
<p>PS1 Matter and its Interactions - Not present in 3rd grade</p>				
<p>PS2 Motion and Stability: Forces and Interactions</p>	<p>Demonstrates minimal or no ability to meet the standard.</p>	<ul style="list-style-type: none"> • Describe the effects of forces on the motion of an object including strength and direction. • Describe that an object's motion provides evidence that a pattern can be used to predict future motion. • Recognize a cause and effect relationship of electric or magnetic interactions between two objects not in contact with each other. 	<ul style="list-style-type: none"> • Plan and conduct an investigation to provide evidence of the effects of multiple balanced and unbalanced forces on motion of an object including strength and direction. • Observe and measure an object's motion to provide evidence that a pattern can be used to predict future motion. • Determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other. 	<ul style="list-style-type: none"> • Plan, conduct, and revise an investigation to provide evidence of the effects of multiple balanced and unbalanced forces on motion of an object including strength and direction. • Prove that an object's motion can provide evidence that a pattern can be used to predict future motion. • Design a solution to a problem based on the cause and effect relationships of electric or magnetic interactions.
<p>PS3 Energy - Not present in 3rd grade</p>				
<p>PS4 Waves and their Applications in Technologies for Information Transfer - Not present in 3rd grade</p>				

Grade 3 PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Life Science				
LS1 From Molecules to Organisms: Structure and Processes	Demonstrates minimal or no ability to meet the standard.	Develop a model to show organisms have life cycle patterns including the essential elements of birth, growth, reproduction, and death.	Develop multiple models to show that organisms have unique and diverse life cycle patterns including the essential elements of birth, growth, reproduction, and death.	Develop and Compare multiple models to show that organisms have unique and diverse life cycle patterns including the essential elements of birth, growth, reproduction, and death.
LS2 Ecosystems: Interactions, Energy, and Dynamics	Demonstrates minimal or no ability to meet the standard.	Identify animals that form groups to help them survive.	Explain that some animals form groups, of various sizes, that help them obtain food, defend themselves, and cope with changes.	Evaluate the effectiveness of different groups of animals, of various sizes, on how well they obtain food, defend themselves, and cope with changes.
LS3 Heredity: Inheritance and Variation of Traits	Demonstrates minimal or no ability to meet the standard.	<ul style="list-style-type: none"> • Demonstrate that plants and animals have patterned traits inherited from parents, which cause a difference in how they look and function. • Examine evidence that an organism's observable traits can be influenced by the environment. 	<ul style="list-style-type: none"> • Analyze and interpret data to provide evidence that plants and animals have patterned traits inherited from parents, which cause a difference in how they look and function, and that variation of these traits exists in groups of similar organisms. • Gather evidence and explain that an organism's observable traits can be influenced by the environment. 	<ul style="list-style-type: none"> • Analyze and critique data to develop an argument which proves that plants and animals have patterned traits inherited from parents, which cause a difference in how they look and function, and that variation of these traits exists in groups of similar organisms. • Interpret evidence in order to construct an argument that an organism's observable traits can be influenced by the environment.

Grade 3 PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
<p>LS4 Biological Evolution: Unity and Diversity</p>	<p>Demonstrates minimal or no ability to meet the standard.</p>	<ul style="list-style-type: none"> • Examine data from fossils to show that plants, animals, and environments that once existed are no longer found. • Explain how the variations in characteristics among individuals of the same species may provide advantages. • Describe, with evidence, that in a particular habitat some organisms can survive well, some survive less well, some relocate, and some cannot survive at all. • Explain a solution to problem caused by an environmental change. 	<ul style="list-style-type: none"> • Analyze and interpret data from fossils to provide evidence that plants, animals, and environments that once existed are no longer found. • Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. • Construct an argument with evidence that shows that in a particular habitat some organisms can survive well, some survive less well, some relocate, and some cannot survive at all, especially when an environment changes. • Construct an argument about the merit of a particular solution to an environmental change. 	<ul style="list-style-type: none"> • Analyze, interpret, and defend data from fossils to provide evidence that plants, animals, and environments that once existed are no longer found. • Use evidence to prove that variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. • Present an argument with evidence that shows that in a particular habitat some organisms can survive well, some survive less well, some relocate, and some cannot survive at all, especially when an environment changes. • Measure the merit of multiple solutions to a problem caused by environmental changes.

DRAFT for Public Input

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Earth and Space Science				
ESS1 Earth's Place in the Universe - Not present in 3rd grade				
ESS2 Earth's Systems	Demonstrates minimal or no ability to meet the standard.	<ul style="list-style-type: none"> Analyze tables to describe typical weather conditions and patterns expected during a particular season. Describe climates in different regions of the world and the extent to which those conditions vary over years. 	<ul style="list-style-type: none"> Create tables and graphs to describe typical weather conditions and patterns expected during a particular season while also making predictions about future weather. Obtain and combine information to describe climates in different regions of the world and the extent to which those conditions vary over years. 	<ul style="list-style-type: none"> Interpret the data provided to create tables and graphs that describe typical weather conditions and patterns expected during a particular season while also making predictions about future weather. Obtain and combine information to describe climates in different regions of the world and measure the extent to which those conditions vary over years.
ESS3 Earth and Human Activity	Demonstrates minimal or no ability to meet the standard.	Identify a design solution that reduces, but does not eliminate the impacts of a weather-related natural hazard.	Make a claim about the merit of a design solution that reduces, but does not eliminate, the impacts of weather-related natural hazards.	Evaluate and critique a claim about the merit of a design solution that reduces, but does not eliminate the impacts of weather-related natural hazards.

Grade 3 PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Engineering and Design				
<p align="center">ETS1 Engineering, Technology, and Applications of Science</p>	<p>Demonstrates minimal or no ability to meet the standard.</p>	<ul style="list-style-type: none"> • Find a simple design problem reflecting a need or a want. • Identify possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. • Carry out a fair test in which variables are controlled and failure points are considered. 	<ul style="list-style-type: none"> • Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. • Generate and compare possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. • Plan and carry out fair tests of a variety of solutions in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. 	<ul style="list-style-type: none"> • Test a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. • Use research and collaboration to generate and compare possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. • Plan, carry out, and critique fair tests of a variety of solutions in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved and implement improvements.

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Grade 4

WY-TOPP 2021+ SCIENCE PERFORMANCE LEVEL DESCRIPTORS (PLDs)

<p>Policy Level PLDs - General descriptors that provide overall claims about a student's performance in each performance level; used to broadly articulate the goals and rigor for the state's performance standards.</p>	<p>Students performing at the below basic level in science demonstrate minimal or no understanding of crosscutting concepts, disciplinary core ideas, and science and engineering practices to explain phenomena.</p>	<p>Students performing at the basic level in science inconsistently apply crosscutting concepts and disciplinary core ideas to explain phenomena. These students are able to implement science and engineering practices to a limited extent.</p>	<p>Students performing at the proficient level in science effectively apply crosscutting concepts, disciplinary core ideas, and science and engineering practices to explain phenomena and design solutions to problems.</p>	<p>Students performing at the advanced level in science effectively integrate crosscutting concepts, disciplinary core ideas, and science and engineering practices to explain phenomena and to design and evaluate solutions to problems.</p>
<p>Grade 4 PLDs</p>	<p>A Below Basic Student:</p>	<p>A Basic Student is able to:</p>	<p>A Proficient Student is able to:</p>	<p>In addition to Proficient, an Advanced Student is able to:</p>
<p>Physical Science</p>				
<p>PS1 Matter and its Interactions - Not present in 4th grade</p>				
<p>PS2 Motion and Stability: Forces and Interactions - Not present in 4th grade</p>				
<p>PS3 Energy</p>	<p>Demonstrates minimal or no ability to meet the standard.</p>	<ul style="list-style-type: none"> • Use evidence to support an explanation about the relationship of an object's speed and its energy. • Observe changes in energy when objects collide. • Design a device that converts energy from one form to another. • Support an explanation about the relationship of energy to light, sound, heat, and electric currents. 	<ul style="list-style-type: none"> • Use evidence to construct an explanation about the relationship of an object's speed and its energy. • Predict how changes in energy will be observable when objects collide. • Design, test and refine a device that converts energy from one form to another. • Construct an explanation about the relationship of energy to light, sound, heat, and electric currents. 	<ul style="list-style-type: none"> • Compare and revise explanations describing the relationship of an object's speed and its energy. • Prove that changes take place when objects collide. • Evaluate and revise the design of a device(s) that converts energy from one form to another. • Compare and revise explanations about the relationship of energy to light, sound, heat, and electric currents.

Grade 4 PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
<p>PS4 Waves and their Applications in Technologies for Information Transfer</p>	<p>Demonstrates minimal or no ability to meet the standard.</p>	<ul style="list-style-type: none"> • Use a model to describe the patterns of waves in terms of amplitude and wavelength. • Use a model describe how waves can cause objects to move. • Use a model describe how waves transfer information. • Use a model describe how reflected light from objects to the eye causes objects to be seen. 	<ul style="list-style-type: none"> • Develop a model to describe the patterns of waves in terms of amplitude and wavelength. • Develop a model to describe how waves can cause objects to move. • Develop a model to describe how waves transfer information. • Develop a model to describe how reflected light from objects to the eye causes objects to be seen. 	<ul style="list-style-type: none"> • Evaluate and revise a model to explain the patterns of waves in terms of amplitude and wavelength. • Evaluate and revise a model to explain how waves can cause objects to move. • Evaluate and revise a model to explain how waves transfer information. • Evaluate and revise a model to explain how reflected light from objects to the eye causes objects to be seen.
Grade 4 PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Life Science				
<p>LS1 From Molecules to Organisms: Structure and Processes</p>	<p>Demonstrates minimal or no ability to meet the standard.</p>	<ul style="list-style-type: none"> • Use evidence to support an argument that plants and animals need internal and external structures to support survival, growth, behavior, and reproduction. • Use a model to show the different specialized sense receptors of an animal. 	<ul style="list-style-type: none"> • Use evidence to construct an argument that plants and animals need internal and external structures to support survival, growth, behavior, and reproduction. • Use a model to describe how animals receive, process and respond to information through different specialized sense receptors, to guide their actions. 	<ul style="list-style-type: none"> • Use evidence to evaluate an argument that explains how plant and animal structures need internal and external structures to support survival, growth, behavior, and reproduction. • Design a model to describe how animals receive, process and respond to information through different specialized sense receptors, to guide their actions.
<p>LS2 Ecosystems: Interactions, Energy, and Dynamics - Not present in 4th grade</p>				
<p>LS3 Heredity: Inheritance and Variation of Traits - Not present in 4th grade</p>				
<p>LS4 Biological Evolution: Unity and Diversity - Not present in 4th grade</p>				

Grade 4 PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Earth and Space Science				
ESS1 Earth's Place in the Universe	Demonstrates minimal or no ability to meet the standard.	Explain changes in a landscape over time using rock formations and the presence and location of fossils.	Support an explanation of changes in a landscape over time using evidence from local, regional, and global patterns in rock formations and the presence and location of fossils.	Design a demonstration that provides an explanation of changes in a landscape over time using evidence from local, regional, and global patterns in rock formations and the presence and location of fossils.
ESS2 Earth's Systems	Demonstrates minimal or no ability to meet the standard.	<ul style="list-style-type: none"> • Make observations of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. • Use maps to describe patterns of Earth's features. 	<ul style="list-style-type: none"> • Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation and its effects on the types of living things that reside in a region. • Analyze and interpret data from maps to describe patterns of Earth's features, including their location and relation to earthquakes and volcanoes. 	<ul style="list-style-type: none"> • Prove the effects of weathering or the rate of erosion by water, ice, wind, or vegetation and its effects on the types of living things that reside in a region using observations and measurements. • Construct maps to display patterns of Earth's features, including their location and relation to earthquakes and volcanoes.
ESS3 Earth and Human Activity	Demonstrates minimal or no ability to meet the standard.	<ul style="list-style-type: none"> • Describe that energy and fuels are derived from natural resources and how their uses affect the environment. • Compare multiple solutions that can reduce, but not eliminate, the impacts of hazards caused by natural earth processes on humans. 	<ul style="list-style-type: none"> • Obtain and combine information to describe that energy and fuels are derived from renewable and nonrenewable natural resources and how their uses affect the environment. • Generate and compare the merit of multiple solutions that can reduce, but not eliminate, the impacts of hazards caused by natural earth processes on humans. 	<ul style="list-style-type: none"> • Obtain and combine information to prove that energy and fuels are derived from renewable and nonrenewable natural resources and how their uses affect the environment. • Design an experiment to test a variety of solutions that can reduce, but not eliminate, the impacts of hazards caused by natural earth processes on humans.

Grade 4 PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Engineering and Design				
<p align="center">ETS1 Engineering, Technology, and Applications of Science</p>	<p>Demonstrates minimal or no ability to meet the standard.</p>	<ul style="list-style-type: none"> • Find a simple design problem reflecting a need or a want. • Identify possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. • Carry out a fair test in which variables are controlled and failure points are considered. 	<ul style="list-style-type: none"> • Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. • Generate and compare possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. • Plan and carry out fair tests of a variety of solutions in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. 	<ul style="list-style-type: none"> • Test a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. • Use research and collaboration to generate and compare possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. • Plan, carry out, and critique fair tests of a variety of solutions in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved and implement improvements.

Grade 5

WY-TOPP 2021+ SCIENCE PERFORMANCE LEVEL DESCRIPTORS (PLDs)

<p>Policy Level PLDs - General descriptors that provide overall claims about a student's performance in each performance level; used to broadly articulate the goals and rigor for the state's performance standards.</p>	<p>Students performing at the below basic level in science demonstrate minimal or no understanding of crosscutting concepts, disciplinary core ideas, and science and engineering practices to explain phenomena.</p>	<p>Students performing at the basic level in science inconsistently apply crosscutting concepts and disciplinary core ideas to explain phenomena. These students are able to implement science and engineering practices to a limited extent.</p>	<p>Students performing at the proficient level in science effectively apply crosscutting concepts, disciplinary core ideas, and science and engineering practices to explain phenomena and design solutions to problems.</p>	<p>Students performing at the advanced level in science effectively integrate crosscutting concepts, disciplinary core ideas, and science and engineering practices to explain phenomena and to design and evaluate solutions to problems.</p>
<p>Grade 5 PLDs</p>	<p>A Below Basic Student:</p>	<p>A Basic Student is able to:</p>	<p>A Proficient Student is able to:</p>	<p>In addition to Proficient, an Advanced Student is able to:</p>
<p>Physical Science</p>				
<p>PS1 Matter and its Interactions</p>	<p>Demonstrates minimal or no ability to meet the standard.</p>	<ul style="list-style-type: none"> • Use a model to describe matter as made of small particles that are too small to be seen, but can be detected. • Use a model showing that the particles of gases move freely around in space and can explain the effects of air on larger particles or objects. • Explain that matter is conserved when it changes form. • Make observations to identify materials based on their physical properties. • Make observations that mixing different types of matter can result in new substances. 	<ul style="list-style-type: none"> • Develop models to represent that matter is made up of small particles that are too small to be seen, but can be detected. • Develop a model showing that the particles of gases move freely around in space and can explain the effects of air on larger particles or objects. • Measure and graph data to provide evidence that matter is conserved when it changes form. • Make observations and measurements to identify materials based on their physical properties. • Conduct an investigation to provide data that mixing different types of matter can result in new substances. 	<ul style="list-style-type: none"> • Evaluate and revise models that represent that matter is made of small particles that are too small to be seen, but can be detected. • Evaluate and revise models showing that the particles of gases move freely around in space and can explain the effects of air on larger particles or objects. • Create models showing that the amount of matter is conserved when it changes form. • Conduct an investigation that can identify materials based on their physical properties. • Plan and conduct an investigation to provide data that mixing different types of matter can result in new substances.

Grade 5 PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
PS2 Motion and Stability: Forces and Interactions	Demonstrates minimal or no ability to meet the standard.	Explain that the gravitational force exerted by Earth on an object pulls the object toward the planet's center.	Support an argument that the gravitational force exerted by Earth on an object pulls the object toward the planet's center.	Support an argument using evidence, data or a model that the gravitational force exerted by Earth on an object pulls the object toward the planet's center.
PS3 Energy	Demonstrates minimal or no ability to meet the standard.	Use models to describe that animals get their energy from food.	Use models to describe that energy in animals' food was once energy from the sun.	Create models to show that the energy in animals' food was once energy from the sun.
PS4 Waves and their Applications in Technologies for Information Transfer - Not Present in 5th grade				
Grade 5 PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Life Science				
LS1 From Molecules to Organisms: Structure and Processes	Demonstrates minimal or no ability to meet the standard.	Explain that plants get the materials they need for growth primarily from air and water.	Support an argument that plants get the materials they need for growth primarily from air and water, and not from the soil.	Design an experiment to prove that plants get the materials they need for growth primarily from air and water, and not from the soil.
LS2 Ecosystems: Interactions, Energy, and Dynamics	Demonstrates minimal or no ability to meet the standard.	Label a model that shows the movement of matter among plants, animals, decomposers, and the environment.	Develop a model to describe the movement and continual cycle of matter among plants, animals, decomposers, and the environment that shows the necessity of each native member in a healthy ecosystem.	Design an experiment that shows the movement and continual cycle of matter among plants, animals, decomposers, and the environment and shows the necessity of each native member in a healthy ecosystem.
LS3 Heredity: Inheritance and Variation of Traits - Not present in 5th grade				
LS4 Biological Evolution: Unity and Diversity - Not present in 5th grade				

Grade 5 PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Earth and Space Science				
ESS1 Earth's Place in the Universe	Demonstrates minimal or no ability to meet the standard.	<ul style="list-style-type: none"> • Explain the differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. • Explain how the orbit and rotation of the Earth and Moon cause patterns of shadows, day and night, and the seasonal appearance of some stars in the night sky at different times of the day, month, and year. 	<ul style="list-style-type: none"> • Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. • Represent data in graphs to reveal how the orbit and rotation of the Earth and Moon cause patterns of shadows, day and night, and the seasonal appearance of some stars in the night sky at different times of the day, month, and year. 	<ul style="list-style-type: none"> • Defend an argument using evidence that the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. • Collect evidence and represent findings in graphs to reveal how the orbit and rotation of the Earth and Moon cause patterns of shadows, day and night, and the seasonal appearance of some stars in the night sky at different times of the day, month, and year.
ESS2 Earth's Systems	Demonstrates minimal or no ability to meet the standard.	<ul style="list-style-type: none"> • Describe how the geosphere, biosphere, hydrosphere, and/or atmosphere interact. • Describe the amounts and percentages of water and fresh water in various reservoirs to show the distribution of water on Earth. 	<ul style="list-style-type: none"> • Develop a model using an example to describe how the geosphere, biosphere, hydrosphere, and/or atmosphere interact in multiple ways to affect Earth's landforms, climates, surface materials, and processes. • Graph the amounts and percentages of water and fresh water in various reservoirs to show the distribution of water on Earth. 	<ul style="list-style-type: none"> • Critique a model that describes how the geosphere, biosphere, hydrosphere, and/or atmosphere interact in multiple ways to affect Earth's landforms, climates, surface materials, and processes. • Measure and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence of the distribution of water on Earth.
ESS3 Earth and Human Activity	Demonstrates minimal or no ability to meet the standard.	Describe how human activities impact Earth's resources and environments.	Obtain and combine information about how human activities impact Earth's resources and environments and the ways individual communities use scientific ideas to conserve these factors.	Obtain and combine information about how human activities impact Earth's resources and environments and critique the ways individual communities use scientific ideas to conserve these factors.

Grade 5 PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Engineering and Design				
<p align="center">ETS1 Engineering, Technology, and Applications of Science</p>	<p>Demonstrates minimal or no ability to meet the standard.</p>	<ul style="list-style-type: none"> • Find a simple design problem reflecting a need or a want. • Identify possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. • Carry out a fair test in which variables are controlled and failure points are considered. 	<ul style="list-style-type: none"> • Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. • Generate and compare possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. • Plan and carry out fair tests of a variety of solutions in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. 	<ul style="list-style-type: none"> • Test a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. • Use research and collaboration to generate and compare possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. • Plan, carry out, and critique fair tests of a variety of solutions in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved and implement improvements.

Middle School

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<p>Middle School PLDs</p>	<p>A Below Basic Student:</p>	<p>A Basic Student is able to:</p>	<p>A Proficient Student is able to:</p>	<p>In addition to Proficient, an Advanced Student is able to:</p>

Physical Science

<p>MS-PS1 Matter and its Interactions</p>	<p>Demonstrates minimal or no ability to meet the standard.</p>	<p>Use models and interpret patterns in data to identify changes (including states of matter) in particle motion when thermal energy is added to or removed from a system, to determine if a physical change or a chemical reaction has occurred.</p>	<p>Develop and use models and interpret patterns in data to predict changes (including states of matter) in particle motion when thermal energy is added to or removed from a system, to determine if a physical change or a chemical reaction has occurred by means of comparing products and reactants and to show that mass is conserved.</p>	<p>Evaluate and revise models and interpret patterns in data to predict changes (including states of matter) in particle motion when thermal energy is added to or removed from a system, to determine if a physical change or a chemical reaction has occurred by means of comparing products and reactants and to show that mass is conserved.</p>
<p>MS-PS2 Motion and Stability: Forces and Interactions</p>	<p>Demonstrates minimal or no ability to meet the standard.</p>	<ul style="list-style-type: none"> • Describe changes in invisible forces. • Use data from an investigation to explain how an object's motion changes based on its mass. 	<ul style="list-style-type: none"> • Ask questions about factors that cause changes in the strength of invisible forces, both attractive and repulsive. • Use data from an investigation to construct an argument about how change in an object's motion depends on its mass and the forces with which it interacts. 	<ul style="list-style-type: none"> • Ask questions and identify factors that cause changes in the strength of invisible forces, both attractive and repulsive. • Use data from an investigation to predict an object's change in motion depending on its mass and the forces with which it interacts.

Middle School PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
MS-PS3 Energy	Demonstrates minimal or no ability to meet the standard.	<ul style="list-style-type: none"> • Use graphical displays of data to relate an object's speed and kinetic energy to the object's mass. • Use evidence to describe energy transfers and changes in kinetic energy. 	<ul style="list-style-type: none"> • Use information to construct graphical displays of data that describe quantitative relationships of an object's speed and kinetic energy to the object's mass. • Use evidence and modeling to construct an argument about energy transfers and changes in kinetic energy. 	<ul style="list-style-type: none"> • Use information to construct graphical displays of data and describe quantitative relationships of an object's speed and kinetic energy to the object's mass. • Use mathematical and computational thinking, evidence, and modeling to construct an argument about energy transfers and changes in kinetic energy.
MS-PS4 Waves and their Applications in Technologies for Information Transfer	Demonstrates minimal or no ability to meet the standard.	<ul style="list-style-type: none"> • Use a model to describe wave characteristics and wave energy. • Identify whether a wave will be reflected, absorbed, or transmitted. Communicate the function of digital signals. 	<ul style="list-style-type: none"> • Develop and use a model to describe the quantitative relationship between wave characteristics and wave energy and use properties of a material to predict whether a wave will be reflected, absorbed, or transmitted. • Evaluate or communicate information about the function of digital signals. 	<ul style="list-style-type: none"> • Evaluate and revise a model to describe the quantitative relationship between wave characteristics and wave energy and use properties of a material to predict whether a wave will be reflected, absorbed, or transmitted. • Evaluate and communicate information about the function of digital signals.

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Middle School PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Life Science				
MS-LS1 From Molecules to Organisms: Structures and Processes	Demonstrates minimal or no ability to meet the standard.	Use data from investigations to describe that living things are made of cells, share common structures and processes which are essential to life.	Use data from investigations to develop models to support the argument that living things are made of one or more cells, share common structures (such as organelles, cells, tissues, organs, organ systems) and processes (such as photosynthesis, cellular respiration, reproduction, growth) which are essential to life.	Evaluate and revise models, using data, to support the argument that living things are made of one or more cells, share common structures (such as organelles, cells, tissues, organs, organ systems) and processes (such as photosynthesis, cellular respiration, reproduction, growth) which are essential to life.
MS-LS2 Ecosystems: Interactions, Energy, and Dynamics	Demonstrates minimal or no ability to meet the standard.	<ul style="list-style-type: none"> • Use a model to identify relationships between the living and nonliving parts of an ecosystem which includes the flow of energy and the cycling of matter. • Use data to describe changes in biodiversity. 	<ul style="list-style-type: none"> • Develop and use a model to describe the dynamic relationships between the diverse types of living and nonliving parts of an ecosystem which includes the flow of energy and the cycling of matter. • Analyze data to interpret how interdependent relationships can affect biodiversity and ecosystem services. 	<ul style="list-style-type: none"> • Evaluate strengths and limitations of a model to describe the dynamic relationships between the diverse types of living and nonliving parts of an ecosystem which includes the flow of energy and the cycling of matter. • Analyze data to create an argument that humans impact interdependent relationships, biodiversity or ecosystem services.

Middle School PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
MS-LS3 Heredity: Inheritance and Variation of Traits	Demonstrates minimal or no ability to meet the standard.	Use a model to show that sexual reproduction creates greater genetic variation than asexual reproduction.	Develop and use a model to describe that sexual and asexual reproduction have different results in genetic variation of offspring, and that structural changes to genes (mutations) affect the structure and function of an organism.	Develop and use a model to describe why sexual and asexual reproduction have different results in genetic variation of offspring, and why structural changes to genes (mutations) affect the structure and function of an organism.
MS-LS4 Biological Evolution: Unity and Diversity	Demonstrates minimal or no ability to meet the standard.	<ul style="list-style-type: none"> • Identify patterns in the fossil record. • Use data to identify traits that allow some organisms to survive better than other organisms. 	<ul style="list-style-type: none"> • Analyze patterns in the fossil record to use as evidence for changes in populations over time. • Use data to construct an explanation that some organisms survive better than other organisms because of similarities and differences in traits, either naturally or artificially selected. 	<ul style="list-style-type: none"> • Analyze patterns in the fossil record to construct an explanation for changes in populations over time. • Use mathematical modeling to construct an explanation that some organisms survive better than other organisms because of similarities and differences in traits, either naturally or artificially selected.

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Middle School PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Earth and Space Science				
MS-ESS1 Earth's Place in the Universe	Demonstrates minimal or no ability to meet the standard.	<ul style="list-style-type: none"> • Use models to identify patterns of motions of the sun, Earth, and moon system and the role of gravity in the motions of objects within the galaxy. • Compare sizes of objects in the solar system. • Use the geologic time scale to describe Earth's history. 	<ul style="list-style-type: none"> • Develop and use a model to describe patterns of motions of the sun, Earth, and moon system and the role of gravity in the motions of objects within the galaxy. • Analyze and interpret data to determine scale of objects in the solar system. • Use evidence to construct an explanation about how the geologic time scale describes Earth's history. 	<ul style="list-style-type: none"> • Evaluate and determine the strengths and limitations of models to describe patterns of motions of the sun, Earth, and moon system and the role of gravity in the motions of objects within the galaxy. • Use mathematical and computational reasoning to determine scale of objects in the solar system. • Evaluate evidence to construct an argument about how the geologic time scale describes Earth's history.
MS-ESS2 Earth's Systems	Demonstrates minimal or no ability to meet the standard.	<ul style="list-style-type: none"> • Use models to identify the energy flow driving the cycling of Earth's water and Earth's materials. • Interpret evidence to construct an explanation for how geologic and atmospheric processes change Earth's surface. 	Develop and use models to describe the energy flow driving the cycling of Earth's water, atmosphere, and materials within and among Earth's systems. Interpret evidence to construct an explanation for how geologic and atmospheric processes, at varying time and spatial scales, change Earth's surface.	<ul style="list-style-type: none"> • Evaluate and revise models to describe the energy flow driving the cycling of Earth's water, atmosphere, and materials within and among Earth's systems. • Analyze and interpret evidence to construct an explanation for how geologic and atmospheric processes, at varying time and spatial scales, change Earth's surface.

Middle School PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
MS-ESS3 Earth and Human Activity	Demonstrates minimal or no ability to meet the standard.	<ul style="list-style-type: none"> • Use evidence to confirm that human populations and resource consumption impact Earth's systems. • Identify natural hazards and their effects. Recognize strategies to minimize human impact on the environment. 	<ul style="list-style-type: none"> • Construct an argument supported by evidence to demonstrate that human populations and resource consumption impact Earth's systems. • Interpret data on natural hazards to forecast and mitigate their effect on the environment. • Design a method to minimize human impact on the environment. 	<ul style="list-style-type: none"> • Construct an argument supported by evidence to explain how human populations and resource consumption impact Earth's systems. • Analyze and interpret data on natural hazards to forecast and mitigate their effect on the environment. • Evaluate and revise a method that minimizes human impact on the environment.
Middle School PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Engineering and Design				
MS-ETS1 Engineering, Technology, and Applications of Science	Demonstrates minimal or no ability to meet the standard.	Identify a successful solution to a problem that takes into account potential impacts on people or the environment, given constraints and criteria.	Define and use constraints and criteria to develop a solution to a problem that takes into account potential impacts on people and the environment.	Define and use constraints and criteria to develop a successful solution to a problem that takes into account potential impacts on people and the environment.

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<p>High School PLDs</p>	<p>A Below Basic Student:</p>	<p>A Basic Student is able to:</p>	<p>A Proficient Student is able to:</p>	<p>In addition to Proficient, an Advanced Student is able to:</p>
<p>Physical Science</p>				
<p>HS-PS1 Matter and its Interactions</p>	<p>Demonstrates minimal or no ability to meet the standard.</p>	<p>Use a model based on the patterns of subatomic particles to describe properties of matter, describe the change of reaction rates, and describe resultant energy changes.</p>	<p>Develop and use a model based on the patterns of subatomic particles to predict properties of matter, explain the change of reaction rates as well as resultant energy changes, while demonstrating the law of conservation of mass.</p>	<p>Analyze a model based on patterns of subatomic particles to generate data supporting the law of conservation of mass, illustrate nuclear changes, and construct an explanation of the change of reaction rates and resultant energy changes.</p>
<p>HS-PS2 Motion and Stability: Forces and Interactions</p>	<p>Demonstrates minimal or no ability to meet the standard.</p>	<p>Conduct an investigation using basic algebraic thinking to collect data that describes the relationship among the net force acting on an object, its mass, acceleration and momentum.</p>	<p>Plan an investigation using mathematical and computational thinking to collect data providing evidence of the relationship among the net force acting on an object: its mass, acceleration, and momentum.</p>	<p>Analyze and improve an investigation using mathematical and computational thinking to collect data providing evidence of the relationship among the net force acting on an object, its mass, acceleration, and momentum with respect to collisions.</p>

High School PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
HS-PS3: Energy	Demonstrates minimal or no ability to meet the standard.	Use a model to describe how forces change and energy is conserved within a system.	Develop a model to quantitatively evaluate how forces change and energy is conserved within a system.	Evaluate and apply data from a model to quantitatively evaluate how forces change and energy is conserved within a system.
HS-PS4. Waves and Their Applications in Technologies for Information Transfer	Demonstrates minimal or no ability to meet the standard.	Use mathematical representations as a model to: <ul style="list-style-type: none"> Describe the relationships among amplitude, frequency and wave speed. Describe how wave speed depends on the medium through which waves travel. 	Develop and use mathematical representations as a model to qualitatively predict how various media will affect amplitude, frequency and wave speed.	Evaluate mathematical or algorithmic representations as a model that quantitatively predicts how various media will affect amplitude, frequency and wave speed.
High School PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Life Science				
HS-LS1: From Molecules to Organisms: Structures and Processes	Demonstrates minimal or no ability to meet the standard.	Identify, from a model, how living organisms are organized and accomplish essential life functions in order to maintain homeostasis.	Use relevant evidence to develop a model and construct an explanation of how living organisms are organized from simple molecules to complex systems that accomplish essential life functions, in order to maintain homeostasis.	Analyze relevant evidence to revise a model, constructing an explanation of how living organisms are organized from simple molecules to complex systems that accomplish essential life functions, in order to maintain homeostasis via feedback mechanisms.

High School PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
HS-LS2. Ecosystems: Interactions, Energy, and Dynamics	Demonstrates minimal or no ability to meet the standard.	<ul style="list-style-type: none"> Identify how matter and energy flow among organisms in an ecosystem. Given evidence, identify how interactions in ecosystems maintain population and diversity of organisms, but changes in conditions may result in a new ecosystem. 	<ul style="list-style-type: none"> Use mathematical and computational representations to support claims about the cycling of matter and flow of energy among organisms in an ecosystem. Use claims and evidence to describe how interactions in ecosystems maintain population and diversity of organisms but changes in conditions may result in a new ecosystem. 	<ul style="list-style-type: none"> Use mathematical and computational representations to analyze claims and predict outcomes about the cycling of matter and flow of energy among organisms in an ecosystem. Evaluate and use claims and evidence that interactions in ecosystems maintain population and diversity of organisms while changes in conditions may result in a new ecosystem.
HS-LS3. Heredity: Inheritance and Variation of Traits	Demonstrates minimal or no ability to meet the standard.	<ul style="list-style-type: none"> Identify the role of DNA, chromosomes, and traits. Identify causes of inheritable genetic variation. Identify variations and distribution of expressed traits in a population. 	<ul style="list-style-type: none"> Ask questions to determine relationships about the role of DNA, chromosomes, and traits. Use evidence to make a claim about causes of inheritable genetic variation. Apply concepts of statistics and probability to describe variations and distribution of expressed traits in a population. 	<ul style="list-style-type: none"> Ask questions to clarify relationships about the role of DNA, chromosomes, and traits. Use evidence to defend a claim about causes of inheritable genetic variation. Apply concepts of statistics and probability to analyze and explain variations and distribution of expressed traits in a population.
HS-LS4. Biological Evolution: Unity and Diversity	Demonstrates minimal or no ability to meet the standard.	<ul style="list-style-type: none"> Identify an explanation based on evidence of how given factors result in change over time. Identify how environmental conditions lead to adaptations within populations. 	<ul style="list-style-type: none"> Construct an explanation based on evidence of how given factors result in change over time. Use qualitative and quantitative evidence to explain how environmental conditions lead to adaptations within populations. 	<ul style="list-style-type: none"> Revise an explanation based on evidence of how given factors result in change over time. Use statistical evidence to construct an argument predicting how environmental conditions lead to adaptations within populations.

High School PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Earth and Space Science				
HS-ESS1 Earth's Place in the Universe	Demonstrates minimal or no ability to meet the standard.	Given a model, identify processes of the Sun and the energy it emits.	Evaluate information and develop a model to describe the processes of the Sun and the energy it emits.	Analyze information to describe how the processes to produce elements and the resulting energy within stars depends on the mass and age of the star.
HS-ESS2 Earth's Systems	Demonstrates minimal or no ability to meet the standard.	<ul style="list-style-type: none"> • Use a model to identify how variations in energy flow within the Earth's systems change the climate. • Identify evidence that one change to Earth's surface can cause changes to other Earth systems. 	<ul style="list-style-type: none"> • Use a model to describe how variations in energy flow into and out of Earth's systems cause changes in climate. • Analyze data to make a claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems. 	<ul style="list-style-type: none"> • Evaluate and revise a model to predict how variations in energy flow into and out of Earth's systems result in changes in climate. • Analyze data to evaluate a claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.
HS-ESS3 Earth and Human Activity	Demonstrates minimal or no ability to meet the standard.	Construct an explanation for how human activity has been influenced by either natural resources, natural hazards, or climate change.	Construct an explanation for how human activity has been influenced by availability of natural resources, natural hazards and climate change.	Construct an explanation for how future human activity will positively or negatively influence the availability of natural resources, natural hazards and climate change.
High School PLDs	A Below Basic Student:	A Basic Student is able to:	A Proficient Student is able to:	In addition to Proficient, an Advanced Student is able to:
Engineering and Design				
HS-ETS1 Engineering, Technology, and Applications of Science	Demonstrates minimal or no ability to meet the standard.	Identify a solution to a real-world problem based on observations.	Design a solution to a complex real-world problem, breaking it down into manageable components to be solved through engineering.	Evaluate and revise a solution to a complex real-world problem based on specific criteria, trade-offs and constraints that accounts for societal needs and wants.