

Colorado Academic Standards in Science Correlation to *PhD Science*®

- Green indicates that *PhD Science*® fully addresses the standard within the grade level.
- Blue indicates that *PhD Science* covers the standard but in a different grade level.
- Yellow indicates that *PhD Science* partially covers the standard within the grade level.
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Key: Module (M), Lesson (L)

PhD Science Level K

The Kindergarten Colorado Academic Standards in Science are fully covered by the Level K *PhD Science* curriculum. A detailed analysis of alignment appears in the table below.

Kindergarten: Grade Level Expectations and Evidence Outcomes		
Standard 1. Physical Science		
1. Pushes and pulls can have different strengths and directions, and can change the speed or direction of an object’s motion or start or stop it.		Aligned <i>PhD Science</i> Lessons
a.	Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.	Level K M2 L1–23
b.	Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.	Level K M2 L17–23
2. Sunlight affects the Earth’s surface		Aligned <i>PhD Science</i> Lessons
a.	Make observations to determine the effect of sunlight on Earth’s surface.	Level K M1 L8–11, 28–30
b.	Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.	Level K M1 L12–16, 28–30

Standard 2. Life Science		
1. To live and grow, animals obtain food they need from plants or other animals, and plants need water and light.		Aligned <i>PhD Science</i> Lessons
a.	Use observations to describe patterns of what plants and animals (including humans) need to survive.	Level K M3 L4–16, 19–22, 27–29

Standard 3. Earth and Space Science		
1. Patterns are observed when measuring the local weather, including how humans and other organisms impact their environment.		Aligned <i>PhD Science</i> Lessons
a.	Use and share observations of local weather conditions to describe patterns over time.	Level K M1 L1–11, 17–24, 28–30 Level K M4 L25
b.	Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.	Level K M4 L1–10, 14–16, 26–28
2. Plants and animals meet their needs in their habitats and impact one another; people can prepare for severe weather.		Aligned <i>PhD Science</i> Lessons
a.	Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.	Level K M3 L1–3, 9–29 Level K M4 L1–2, 8–9, 11–13
b.	Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.	Level K M1 L22–30
c.	Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.	Level K M4 L14–24, 26–28

Science and Engineering Practices		
1	Asking Questions and Defining Problems	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Ask questions based on observations to find more information about the designed world. 	Level K M1 L1–3, 22–26 Level K M2 L1–3, 9 Level K M3 L1–3, 14–16, 27–29
	<ul style="list-style-type: none"> Use a model to represent relationships in the natural world. 	Level K M3 L1–3, 9–12, 19–20 Level K M4 L1–9, 11–16
3	Planning and Carrying Out Investigations	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> With guidance, plan and conduct an investigation in collaboration with peers. 	Level K M2 L7–8, 10–15 Level K M3 L4–8
	<ul style="list-style-type: none"> Make observations (firsthand or from media) to collect data that can be used to make comparisons. 	Level K M1 L4–7, 10–11, 17–24, 27–30 Level K M2 L7–8, 16–23 Level K M3 L21
4	Analyzing and Interpreting Data	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. 	Level K M3 L4–8, 14–20, 22–26 Level K M4 L25
6	Constructing Explanations and Designing Solutions	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. 	Level K M2 L17–20
7	Engaging in Argument from Evidence	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Construct an argument with evidence to support a claim. 	Level K M3 L17–21, 27–29
8	Obtaining, Evaluating, and Communicating Information	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. 	Level K M4 L1–2, 6–10, 14–16, 18–19
	<ul style="list-style-type: none"> Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. 	Level K M1 L12–16, 28–30 Level K M2 L21–23 Level K M3 L27–29 Level K M4 L20–24, 26–28

Elaboration on the Grade Level Expectation		
Physical Science		
PS2:A	Forces and Motion	Aligned <i>PhD Science</i> Lessons
	Pushes and pulls can have different strengths and directions.	Level K M2 L7–23
	Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it.	Level K M2 L1–23
PS2:B	Types of Interactions	Aligned <i>PhD Science</i> Lessons
	When objects touch or collide, they push on one another and can change motion.	Level K M2 L13–23
PS3:B	Conservation of Energy and Energy Transfer	Aligned <i>PhD Science</i> Lessons
	Sunlight warms Earth’s surface.	Level K M1 L8–16, 28–30
PS3:C	Relationship Between Energy and Forces	Aligned <i>PhD Science</i> Lessons
	A bigger push or pull makes things speed up or slow down more quickly.	Level K M2 L7–9, 21–23

Life Science		
LS1:C	Organization for Matter and Energy Flow in Organisms	Aligned <i>PhD Science</i> Lessons
	All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.	Level K M3 L4–16, 19–20, 22, 27–29

Earth and Space Science		
ESS2:D	Weather and Climate	Aligned <i>PhD Science</i> Lessons
	Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time.	Level K M1 L1–11, 17–24, 28–30 Level K M4 L25
ESS2:E	Biogeology	Aligned <i>PhD Science</i> Lessons
	Plants and animals can change their environment.	Level K M4 L1–10, 14–16, 26–28


ESS3:A	Natural Resources	Aligned <i>PhD Science</i> Lessons
	Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do.	Level K M3 L1–3, 9–29 Level K M4 L1–5, 8–9, 11–16
ESS3:B	Natural Hazards	Aligned <i>PhD Science</i> Lessons
	Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events.	Level K M1 L17–20, 22–30
ESS3:C	Human Impacts on Earth Systems	Aligned <i>PhD Science</i> Lessons
	Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things.	Level K M4 L11–24, 26–28


Crosscutting Concepts		
1	Patterns	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence. 	Level K M1 L17–30 Level K M2 L1–6, 17–20 Level K M3 L4–8, 14–20, 22, 26–29 Level K M4 L3–5
2	Cause and Effect	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Events have causes that generate observable patterns. 	Level K M2 L4–16, 21–23 Level K M4 L3–5, 10, 14–19, 26–28
	<ul style="list-style-type: none"> Simple tests can be designed to gather evidence to support or refute student ideas about causes. 	Level K M2 L10–12, 17–20
4	Systems and System Models	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Systems in the natural and designed world have parts that work together. 	Level K M3 L1–3, 9–13, 19–21, 23–25, 27–29 Level K M4 L1–9, 11–16


Connections to Nature of Science	Aligned <i>PhD Science</i> Lessons
<ul style="list-style-type: none"> Scientists use different ways to study the world. 	Level K M2 L16
<ul style="list-style-type: none"> Scientists look for patterns and order when making observations about the world. 	Level K M3 L4–8, 14–16

Connections to Engineering, Technology, and Applications of Science	Aligned <i>PhD Science</i> Lessons
<ul style="list-style-type: none"> People encounter questions about the natural world every day. 	Level K M3 L1–3 Level K M4 L25
<ul style="list-style-type: none"> People depend on various technologies in their lives; human life would be very different without technology. 	Level K M4 L18–19

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Key: Module (M), Lesson (L)

PhD Science Level 1

The Grade 1 Colorado Academic Standards in Science are covered by the Level 1 *PhD Science* curriculum: Some standards are covered in a different grade level. A detailed analysis of alignment appears in the table below.

First Grade: Grade Level Expectations and Evidence Outcomes		
Standard 1. Physical Science		
1. Sound can make matter vibrate and vibrating matter can make sound.		Aligned <i>PhD Science</i> Lessons
a.	Plan and conduct investigations to provide evidence that vibrating materials can make a sound and that sound can make materials vibrate.	 Level 1 M3 L1–17, 26–29
b.	Make observations to construct an evidence-based account that objects can be seen only when illuminated.	 Level 1 M2 L1–9, 21–23
c.	Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.	 Level 1 M2 L1–3, 10–23
d.	Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.	 Level 1 M3 L18–29

Standard 2. Life Science		
1. All organisms have external parts that they use to perform daily functions.		Aligned <i>PhD Science</i> Lessons
a.	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.	Level 1 M1 L1–21, 27–29
b.	Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.	Level 1 M1 L24–29
2. Young organisms are very much, but not exactly, like their parents, and also resemble other organisms of the same kind.		Aligned <i>PhD Science</i> Lessons
a.	Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.	Level 1 M1 L22–23, 26–29

Standard 3. Earth and Space Science		
1. Patterns of movement of the sun, moon, and stars as seen from Earth can be observed, described, and predicted.		Aligned <i>PhD Science</i> Lessons
a.	Use observations of the sun, moon, and stars to describe patterns that can be predicted.	Level 1 M4 L1–8, 14–25
b.	Make observations at different times of year to relate the amount of daylight to the time of year.	Level 1 M4 L9–13, 23–25

Science and Engineering Practices		
3	Planning and Carrying Out Investigations	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Plan and conduct investigations collaboratively to produce evidence to answer a question. 	Level 1 M1 L19–20 Level 1 M2 L15–18
4	Analyzing and Interpreting Data	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. 	Level 1 M1 L16–21, 27–29 Level 1 M2 L1–9 Level 1 M3 L10 Level 1 M4 L4–6, 9–13
6	Constructing Explanations and Designing Solutions	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. 	Level 1 M1 L7–8, 16–17, 22–23, 26–29 Level 1 M2 L4–7, 21–23 Level 1 M3 L4–6, 14, 26–29
	<ul style="list-style-type: none"> Make observations (firsthand or from media) to construct an evidence-based conclusion and use tools and materials provided to design and build devices. 	Level 1 M1 L11–15
	<ul style="list-style-type: none"> Use materials to design a device that solves a specific problem or a solution to a specific problem. 	Level 1 M1 L11–15
8	Obtaining, Evaluating, and Communicating Information	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world. 	Level 1 M1 L24–25 Level 1 M3 L18–19 Level 1 M4 L9–13

Elaboration on the GLE		
Physical Science		
PS4:A	Wave Properties	Aligned <i>PhD Science</i> Lessons
	Sound can make matter vibrate, and vibrating matter can make sound.	Level 1 M3 L1–17, 26–29
	Waves, which are regular patterns of motion, can be made in water by disturbing the surface. When waves move across the surface of deep water, the water goes up and down in place; it does not move in the direction of the wave except when the water meets the beach.	Level 4 M3 L10
PS4:B	Electromagnetic Radiation	Aligned <i>PhD Science</i> Lessons
	Objects can be seen only when light is available to illuminate them.	Level 1 M2 L1–9, 21–23
	Very hot objects give off light.	Level K M1 L8–11, 28–30
PS4:C	Information Technologies and Instrumentation	Aligned <i>PhD Science</i> Lessons
	People use their senses to learn about the world around them. Their eyes detect light, their ears detect sound, and they can feel vibrations by touch.	Level 1 M3 L5–6, 15–16, 20

Life Science		
LS1:A	Structure and Function	Aligned <i>PhD Science</i> Lessons
	All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive, grow, and produce more plants.	Level 1 M1 L1–15, 27–29
LS1:B	Growth and Development of Organisms	Aligned <i>PhD Science</i> Lessons
	Plants and animals have predictable characteristics at different stages of development. Plants and animals grow and change.	Level 2 M3 L4 Level 3 M2 L17, 19
	Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive.	Level 1 M1 L24–29
LS1:D	Information Processing	Aligned <i>PhD Science</i> Lessons
	Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs.	Level 1 M1 L16–21, 27–29


LS3:A	Inheritance of Traits	Aligned <i>PhD Science</i> Lessons
	Young animals are very much, but not exactly, like their parents. Plants also are very much, but not exactly, like their parents.	Level 1 M1 L22–23, 26–29
LS3:B	Variation of Traits	Aligned <i>PhD Science</i> Lessons
	Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways.	Level 1 M1 L22–23, 27–29


Earth and Space Science		
ESS1:A	The Universe and Its Stars	Aligned <i>PhD Science</i> Lessons
	Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted.	Level 1 M4 L1–8, 14–25
	At night one can see the light coming from many stars with the naked eye, but telescopes make it possible to see many more and to observe them and the moon and planets in greater detail.	Level 1 M4 L14–16
ESS1:B	Earth and the Solar System	Aligned <i>PhD Science</i> Lessons
	Seasonal patterns of sunrise and sunset can be observed, described, and predicted.	Level 1 M4 L9–13, 23–25

Crosscutting Concepts		
1	Patterns	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence. 	Level 1 M1 L1–6, 16–29 Level 1 M2 L1–9, 21–23 Level 1 M3 L1–7, 11–13, 17–20, 26–29 Level 1 M4 L1–25
2	Cause and Effect	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Simple tests can be designed to gather evidence to support or refute student ideas about causes. 	Level 1 M2 L13–14 Level 1 M3 L7, 15–16
6	Structure and Function	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> The shape and stability of structures of natural and designed objects are related to their function(s). 	Level 1 M1 L4–15, 27–29 Level 1 M3 L8–9

Connections to Nature of Science	
Scientific Investigations Use a Variety of Methods	Aligned <i>PhD Science</i> Lessons
• Science investigations begin with a question.	Level 1 M2 L15–18
• Scientists use different ways to study the world.	Level 1 M4 L4–6
Science Knowledge Is Based on Empirical Evidence	Aligned <i>PhD Science</i> Lessons
• Scientists look for patterns and order when making observations about the world.	Level 1 M1 L24–25 Level 1 M2 L10–12
Scientific Knowledge Assumes an Order and Consistency in Natural Systems	Aligned <i>PhD Science</i> Lessons
• Science assumes natural events happen today as they happened in the past.	Level 1 M4 L9–13

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Key: Module (M), Lesson (L)

PhD Science Level 2

The Grade 2 Colorado Academic Standards in Science are almost entirely covered by the Level 2 *PhD Science* curriculum. A detailed analysis of alignment appears in the table below.

Second Grade: Grade Level Expectations and Evidence Outcomes		
Standard 1. Physical Science		
1. Matter exists as different substances that have observable different properties.		Aligned <i>PhD Science</i> Lessons
a.	Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.	 Level 2 M1 L1–9, 12–16, 19, 23, 29–31 Level 2 M2 L3–4, 14–17
b.	Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.	 Level 2 M1 L20–31
c.	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.	 Level 2 M1 L10–11, 29–31
d.	Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.	 Level 2 M1 L14–19, 29–31

Standard 2. Life Science		
1. Plants depend on water and light to grow and on animals for pollination or to move their seeds around.		Aligned <i>PhD Science</i> Lessons
a.	Plan and conduct an investigation to determine if plants need sunlight and water to grow.	Level 2 M3 L1–7, 25–29
b.	Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.	Level 2 M3 L8–29
2. A range of different organisms lives in different places.		
a.	Make observations of plants and animals to compare the diversity of life in different habitats.	Level 2 M4 L1–3, 7–25

Standard 3. Earth and Space Science		
1. Some events on Earth occur quickly; others can occur very slowly.		Aligned <i>PhD Science</i> Lessons
a.	Use information from several sources to provide evidence that Earth events can occur quickly or slowly.	Level 2 M2 L18–24
2. Wind and water can change the shape of the land; models can show the shape and these changes to the land.		Aligned <i>PhD Science</i> Lessons
a.	Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.	Level 2 M2 L1–17, 20, 22–24
b.	Develop a model to represent the shapes and kinds of land and bodies of water in an area.	Level 2 M2 L1–2, 5–6 Level 2 M4 L1–6, 11–16, 20–21, 23–25
c.	Obtain information to identify where water is found on Earth and that it can be solid or liquid.	Level 2 M4 L1–6, 16, 22–25

Science and Engineering Practices		
2	Developing and Using Models	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Develop a model to represent patterns in the natural world. 	Level 2 M1 L1–3, 14–16, 19, 29–31 Level 2 M2 L1–2, 14–17, 20–24 Level 2 M3 L1–6, 8–12, 19–20, 23–29 Level 2 M4 L1–3, 7–8
	<ul style="list-style-type: none"> Develop a simple model based on evidence to represent a proposed object or tool. 	Level 2 M3 L14–18
3	Planning and Carrying Out Investigations	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. 	Level 2 M2 L8–12 Level 2 M3 L3–7 Level 2 M4 L17–19
	<ul style="list-style-type: none"> Make observations to collect data that can be used to make comparisons. 	Level 2 M1 L1–3, 29–31 Level 2 M2 L1–6, 14–19 Level 2 M3 L3–6, 8–11, 13, 21–22, 25–29 Level 2 M4 L16–19
4	Analyzing and Interpreting Data	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Analyze data from tests of an object or tool to determine if it works as intended. 	Level 2 M1 L20–22, 24–28 Level 2 M3 L14–18
6	Constructing Explanations and Designing Solutions	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Make observations from several sources to construct an evidence-based account for natural phenomena. 	Level 2 M1 L8–9, 12–13, 17–19, 23, 29–31 Level 2 M2 L3–4, 7, 13, 22–24 Level 2 M4 L23–25
	<ul style="list-style-type: none"> Compare multiple solutions to a problem. 	Level 2 M2 L8–12, 14–17

7	Engaging in Argument from Evidence	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Construct an argument with evidence to support a claim. 	Level 2 M2 L3–4, 10–13, 21–24 Level 2 M4 L16
8	Obtaining, Evaluating, and Communicating Information	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question. 	Level 2 M2 L5–6, 18–19 Level 2 M4 L4–9, 11–16, 23–25

Elaboration on the GLE		
Physical Science		
PS1:A	Structure and Properties of Matter	Aligned <i>PhD Science</i> Lessons
	Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties, by its uses, and by whether it occurs naturally or is manufactured.	Level 2 M1 L1–16, 19, 23, 29–31 Level 2 M2 L3–4, 14–17
	Different properties are suited to different purposes.	Level 2 M1 L20–31
	A great variety of objects can be built up from a small set of pieces.	Level 2 M1 L10–11, 24–31
	Objects or samples of a substance can be weighed, and their size can be described and measured.	Level 2 M1 L1–9, 12–16, 19, 23, 29–31 Level 2 M2 L3–4, 14–17
PS1:B	Chemical Reactions	Aligned <i>PhD Science</i> Lessons
	Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not.	Level 2 M1 L14–19, 29–31

Life Science		
LS2:A	Interdependent Relationships in Ecosystems	Aligned <i>PhD Science</i> Lessons
	Animals depend on their surroundings to get what they need, including food, water, shelter, and a favorable temperature. Animals depend on plants or other animals for food. They use their senses to find food and water, and they use their body parts to gather, catch, eat, and chew the food. Plants depend on air, water, minerals (in the soil), and light to grow. Animals can move around, but plants cannot, and they often depend on animals for pollination or to move their seeds around. Different plants survive better in different settings because they have varied needs for water, minerals, and sunlight.	Level 2 M3 L1–29
LS4:D	Biodiversity and Humans	Aligned <i>PhD Science</i> Lessons
	There are many different kinds of living things in any area, and they exist in different places on land and in water.	Level 2 M4 L1–3, 7–25

Earth and Space Science		
ESS1:C	The History of Planet Earth	Aligned <i>PhD Science</i> Lessons
	Some events on Earth occur in cycles, like day and night, and others have a beginning and an end, like a volcanic eruption. Some events, like an earthquake, happen very quickly; others, such as the formation of the Grand Canyon, occur very slowly over a time period much longer than one can observe.	Level 2 M2 L18–24
ESS2:A	Earth Materials and Systems	Aligned <i>PhD Science</i> Lessons
	Wind and water can change the shape of the land. The resulting landforms, together with the materials on the land, provide homes for living things.	Level 2 M2 L1–17, 20, 22–24

ESS2:B	Plate Tectonics and Large-Scale System Interactions	Aligned <i>PhD Science</i> Lessons
	Rocks, soils, and sand are present in most areas where plants and animals live. There may also be rivers, streams, lakes, and ponds.	Level 2 M2 L1–2, 5–6 Level 2 M4 L1–6, 11–16, 20–21, 23–25
	Maps show where things are located. One can map the shapes and kinds of land and water in any area.	Level 2 M2 L1–2, 5–6 Level 2 M4 L1–6, 11–16, 20–21, 23–25
ESS2:C	The Roles of Water in Earth’s Surface Processes	Aligned <i>PhD Science</i> Lessons
	Water is found in the oceans, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. It carries soil and rocks from one place to another and determines the variety of life forms that can live in a particular location.	Level 2 M2 L1–17, 20, 22–24 Level 2 M4 L1–6, 16, 22–25

Crosscutting Concepts		
1	Patterns	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Patterns in the natural and human-designed world can be observed. 	Level 2 M1 L4–9 Level 2 M2 L1–2, 5–6 Level 2 M4 L1–8, 11–15, 20–21, 23–25
2	Cause and Effect	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Events have causes that generate observable patterns. 	Level 2 M1 L14–19, 29–31 Level 2 M2 L20–21 Level 2 M3 L8–11
	<ul style="list-style-type: none"> Simple tests can be designed to gather evidence to support or refute student ideas about causes. 	Level 2 M1 L14–18 Level 2 M2 L8–12 Level 2 M3 L3–7
5	Energy and Matter	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Objects may break into smaller pieces and be put together into larger pieces or may change shapes. 	Level 2 M1 L10–11, 29–31 Level 2 M2 L3–4, 8–13, 22–24

6	Structure and Function	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> The shape and stability of structures of natural and designed objects are related to their function(s). 	Level 2 M1 L24–28 Level 2 M2 L14–17 Level 2 M3 L8–11, 14–22
7	Stability and Change	Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Things may change slowly or rapidly. 	Level 2 M2 L18–24

Connections to Nature of Science		
Science Knowledge Is Based on Empirical Evidence		Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Scientists look for patterns and order when making observations about the world. 	Level 2 M4 L11–13, 17–21
Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena		Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Science searches for cause and effect relationships to explain natural events. 	Level 2 M2 L10–12
Science Addresses Questions About the Natural and Material World		Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Scientists study the natural and material world. 	Level 2 M1 L20–22, 29–31 Level 2 M2 L1–4, 22–24 Level 2 M3 L25–29 Level 2 M4 L23–25

Connections to Engineering, Technology, and Applications of Science		
Influence of Engineering, Technology, and Science on Society and the Natural World		Aligned <i>PhD Science</i> Lessons
	<ul style="list-style-type: none"> Every human-made product is designed. 	Level 2 M2 L14–17 Level 2 M3 L14–18
	<ul style="list-style-type: none"> Developing and using technology has impacts on the natural world. 	Level 2 M2 L8–9