Wisconsin Standards for Science Correlation to *PhD Science*®

Green indicates that *PhD Science*® fully addresses the standard within the grade level or the K–2 grade band.

Blue indicates that *PhD Science* covers the standard but in a different grade band.

Yellow indicates that *PhD Science* partially covers the standard within the grade level or grade band.

Red indicates that *PhD Science* does not cover the standard within the grade level or grade band.

Key: Module (M), Lesson (L)

PhD Science Level K

The Grade K Wisconsin Standards for Science are fully covered by the *PhD Science* K–2 curriculum. A detailed analysis of alignment appears in the table below.

Kindergarten Standards, Learning Priorities, and Performance Indicators

Disciplinary Core Ideas			
Life Science (SCI.LS)			
LS1 Structures and Processes			
SCI.LS1: Students use science and engineering practices, crosscutting concepts, and an understanding of *structures and processes (on a scale from molecules to organisms)* to make sense of phenomena and solve problems.			
SCI.LS1.C: Organization for Matter and Energy Flow in Organisms			**Aligned *PhD Science* Lessons**
SCI.LS1.C.K	Animals obtain food they need from plants or other animals. Plants need water and light.		Level K M3 L4–16, 19–20, 22, 27–29

Physical Science (SCI.PS)			
PS2 Forces, Interactions, Motion, and Stability			
SCI.PS2: Students use science and engineering practices, crosscutting concepts, and an understanding of *forces, interactions, motion, and stability* to make sense of phenomena and solve problems.			
SCI.PS2.A: Forces and Motion			**Aligned *PhD Science* Lessons**
SCI.PS2.A.K	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.		Level K M2 L1–23
	A bigger push or pull makes things speed up or slow down more quickly.		Level K M2 L7–9, 21–23
SCI.PS2.B: Types of Interactions			
SCI.PS2.B.K	When objects touch or collide, they push on one another and can result in a change of motion.		Level K M2 L13–23
PS3 Energy			
SCI.PS3: Students use science and engineering practices, crosscutting concepts, and an understanding of *energy* to make sense of phenomena and solve problems.			
SCI.PS3.C: Relationships Between Energy and Forces			**Aligned *PhD Science* Lessons**
SCI.PS3.C.K	Bigger pushes and pulls cause bigger changes in an object's motion or shape.		Level K M2 L7–9, 21–23
SCI.PS3.D: Energy in Chemical Processes and Everyday Life			
SCI.PS3.D.K	Sunlight warms Earth's surface.		Level K M1 L8–16, 28–30

Earth and Space Science (SCI.ESS)			
ESS2 Earth's Systems			
SCI.ESS2: Students use science and engineering practices, crosscutting concepts, and an understanding of *Earth's systems* to make sense of phenomena and solve problems.			
SCI.ESS2.D: Weather and Climate			**Aligned *PhD Science* Lessons**
SCI.ESS2.D.K	Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People record weather patterns over time.		Level K M1 L1–11, 17–24, 28–30 Level K M4 L25
SCI.ESS2.E: Biogeology			**Aligned *PhD Science* Lessons**
SCI.ESS2.E.K	Plants and animals can change their local environment.		Level K M4 L1–10, 14–16, 26–28

ESS3 Earth and Human Activity			
SCI.ESS3: Students use science and engineering practices, crosscutting concepts, and an understanding of *Earth and human activity* to make sense of phenomena and solve problems.			
SCI.ESS3.A: Natural Resources			**Aligned *PhD Science* Lessons**
SCI.ESS3.A.K	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
SCI.ESS3.B: Natural Hazards			**Aligned *PhD Science* Lessons**
SCI.ESS3.B.K	In a region, some kinds of severe weather are more likely than others. Forecasts allow communities to prepare for severe weather.		Level K M1 L17–20, 22–30
SCI.ESS3.C: Human Impacts on Earth Systems			**Aligned *PhD Science* Lessons**
SCI.ESS3.C.K	Things people do can affect the environment but they can make choices to reduce their impacts.		Level K M4 L11–24, 26–28

Engineering, Technology, and the Application of Science (SCI.ETS)			
ETS1 Engineering Design			
SCI.ETS1: Students use science and engineering practices, crosscutting concepts, and an understanding of *engineering design* to make sense of phenomena and solve problems.			
SCI.ETS1.A: Defining and Delimiting Engineering Problems			**Aligned *PhD Science* Lessons**
SCI.ETS1.A.K–2	A situation that people want to change or create can be approached as a problem to be solved through engineering.		Level K M1 L4–7, 12–16 Level K M2 L17–20
	Asking questions, making observations, and gathering information are helpful in thinking about problems.		Level K M1 L12–16
	Before beginning to design a solution, it is important to clearly understand the problem.		Level K M1 L12–16
SCI.ETS1.B: Developing Possible Solutions			**Aligned *PhD Science* Lessons**
SCI.ETS1.B.K–2	Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.		Level K M2 L17–20 Level K M4 L20–24

ETS2 Links Among Engineering, Technology, Science, and Society			
SCI.ETS2: Students use science and engineering practices, crosscutting concepts, and an understanding of *links among engineering, technology, science, and society* to make sense of phenomena and solve problems.			
SCI.ETS2.A: Interdependence of Science, Engineering, and Technology			**Aligned *PhD Science* Lessons**
SCI.ETS2.A.K–2	Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.		Level K M2 L17–20 Level K M4 L20–24
SCI.ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World			**Aligned *PhD Science* Lessons**
SCI.ETS2.B.K–2	Every human-made product is designed by applying some knowledge of the natural world and is built by using natural materials.		Level 1 M1 L10–15 Level 2 M2 L14–17 Level 2 M3 L14–18
	Taking natural materials to make things impacts the environment.		Level 1 M1 L10–15 Level 2 M2 L14–17 Level 2 M3 L14–18
ETS3 Nature of Science and Engineering			
SCI.ETS3: Students use science and engineering practices, crosscutting concepts, and an understanding of the *nature of science and engineering* to make sense of phenomena and solve problems.			
SCI.ETS3.A: Science and Engineering Are Human Endeavors			**Aligned *PhD Science* Lessons**
SCI.ETS3.A.K–2	People of diverse backgrounds can become scientists and engineers.		Level K M3 L14–16
	People have practiced science and engineering for a long time.		Level K M3 L14–16
	Creativity and imagination are important to science and engineering.		Level K M1 L12–16 Level K M2 L17–20 Level K M3 L4–8 Level K M4 L20–24
SCI.ETS3.B: Science and Engineering Are Unique Ways of Thinking with Different Purposes			**Aligned *PhD Science* Lessons**
SCI.ETS3.B.K–2	Scientists use evidence to explain the natural world.		Level K M2 L16
	Science assumes natural events happen today as they happened in the past.		Level K M1 L21
	Engineers solve problems to meet the needs of people and communities.		Level K M1 L12–16 Level K M2 L17–20 Level K M4 L20–24

SCI.ETS3.C: Science and Engineering Use Multiple Approaches to Create New Knowledge and Solve Problems			Aligned *PhD Science* Lessons
SCI.ETS3.C.K–2	Science and engineers use many approaches to answer questions about the natural world and solve problems.		Level K M3 L1–3 Level K M4 L25
	Scientific explanations are strengthened by being supported with evidence.		Level K M2 L4–6, 9 Level K M4 L25
	An engineering problem can have many solutions. The strength of a solution depends on how well it solves the problem.		Level K M1 L12–16 Level K M2 L17–20 Level K M4 L20–24

Three-Dimensional Performance Indicators			
Life Science (SCI.LS)			
LS1	**Structures and Processes**		**Aligned PhD Science Lessons**
K-LS1-1	Use observations to describe patterns of what plants and animals (including humans) need to survive.		Level K M3 L4–16, 19–22, 27–29

Physical Science (SCI.PS)			
PS2	**Forces, Interactions, Motion, and Stability**		**Aligned PhD Science Lessons**
K-PS2-1	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
K-PS2-2	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
PS3	**Energy**		**Aligned PhD Science Lessons**
K-PS3-1	Make observations to determine the effect of sunlight on Earth's surface.		Level K M1 L8–11, 28–30
K-PS3-2	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

Earth and Space Science (SCI.ESS)			
ESS2	**Earth's Systems**		**Aligned PhD Science Lessons**
K-ESS2-1	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
K-ESS2-2	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
ESS3	**Earth and Human Activity**		**Aligned PhD Science Lessons**
K-ESS3-1	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
K-ESS3-2	Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.		Level K M1 L22–30
K-ESS3-3	Communicate solutions that will reduce the impact of humans on the land, water, air, or other living things in the local environment.		Level K M4 L14–24, 26–28

Engineering, Technology, and the Application of Science (SCI.ETS)			
ETS1	**Engineering Design**		**Aligned PhD Science Lessons**
K–2-ETS1-1	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.		Level K M1 L12–16
K–2-ETS1-2	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.		Level K M2 L17–20
K–2-ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.		Level K M4 L20–24
ETS3	**Nature of Science and Engineering**		**Aligned PhD Science Lessons**
K-ETS3-1	Compare data from two types of investigations (e.g. hands-on and computer-based games) to show that pushes and pulls of different strengths have different effects.		Level K M2 L1–23

Crosscutting Concept Standards and Learning Priorities			
CC1: Patterns			
SCI.CC1: Students use science and engineering practices, disciplinary core ideas, and *patterns* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC1.K–2	Students recognize that 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
CC2: Cause and Effect			
SCI.CC2: Students use science and engineering practices, disciplinary core ideas, and *cause and effect* relationships to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC2.K–2	Students learn that events have causes that generate observable patterns. They design simple tests to gather evidence to support or refute their own ideas about causes.		Level K M2 L4–16, 17–23 Level K M4 L3–5, 10, 14–19, 26–28
CC3: Scale, Proportion, and Quantity			
SCI.CC3: Students use science and engineering practices, disciplinary core ideas, and an understanding of *scale, proportion, and quantity* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC3.K–2	Students use relative scales (e.g., bigger and smaller; hotter and colder; faster and slower) to describe objects. They use standard units to measure length.		Level K M1 L1–7, 10–24, 28–30 Level K M2 L7–9, 13–15, 21–23 Level K M3 L1–3 Level K M4 L25
CC4: Systems and Systems Models			
SCI.CC4: Students use science and engineering practices, disciplinary core ideas, and an understanding of *systems and system models* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC4.K–2	Students understand objects and organisms can be described in terms of their parts and that 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

CC5: Energy and Matter			
SCI.CC5: Students use science and engineering practices, disciplinary core ideas, and an understanding of *energy and matter* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC5.K–2	Students observe objects may break into smaller pieces, be put together into larger pieces, or change shapes.		Level 2 M1 L10–11, 29–31 Level 2 M2 L3–4, 8–13, 22–24
CC6: Structure and Function			
SCI.CC6: Students use science and engineering practices, disciplinary core ideas, and an understanding of *structure and function* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC6.K–2	Students observe the shape and stability of structures of natural and designed objects are related to their function(s).		Level K M1 L10–16 Level K M4 L20–24
CC7: Stability and Change			
SCI.CC7: Students use science and engineering practices, disciplinary core ideas, and an understanding of *stability and change* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC7.K–2	Students observe some things stay the same while other things change, and things may change slowly or rapidly.		Level K M1 L8–9, 17–21 Level K M4 L14–16

Science and Engineering Practice Standards and Learning Priorities			
SEP1: Asking Questions and Defining Problems			
SCI.SEP1: Students *ask questions and define problems*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SEP1.A: Asking Questions			
SCI.SEP1.A.K–2	Students ask simple descriptive questions that can be tested. This includes the following:		**Aligned *PhD Science* Lessons**
	Ask questions based on observations to find more information about the natural world.		Level K M1 L1–3, 22–26 Level K M2 L1–3, 9 Level K M3 L1–3, 14–16, 27–29
	Ask or identify questions that can be answered by an investigation.		Level K M1 L8–9 Level K M3 L4–8, 22
SEP1.B: Defining Problems			**Aligned *PhD Science* Lessons**
SCI.SEP1.B.K–2	Students define simple problems that can be solved through the development of a new or improved object or tool.		Level K M1 L4–7, 12–16
SEP2: Developing and Using Models			
SCI.SEP2: Students *develop and use models*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP2.K–2	Students use and develop models (i.e., diagrams, drawings, physical replicas, dioramas, dramatizations, or storyboards) that represent concrete events or design solutions. This includes the following:		**Aligned *PhD Science* Lessons**
	Distinguish between a model and the actual object, process, or events the model represents.		Level K M1 L1–2, 12–16 Level K M2 L1–3, 10–12
	Compare models to identify common features and differences.		Level 1 M1 L11–15 Level 1 M2 L1–3 Level 2 M4 L1–6, 20–21, 23–25
	Develop or use models to represent amounts, relationships, relative scales (bigger, smaller), and patterns in the natural and designed world(s).		Level K M3 L1–3, 9–12, 19–20 Level K M4 L1–9, 11–16
	Develop a simple model based on evidence to represent a proposed object or tool.		Level K M1 L12–16

SEP3: Planning and Conducting Investigations			
SCI.SEP3: Students *plan and conduct investigations*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP3.K–2	Students plan and carry out simple investigations, based on fair tests, which provide data to support explanations or design solutions. This includes the following:		**Aligned *PhD Science* Lessons**
	With guidance, plan and conduct an investigation in collaboration with peers.		Level K M2 L7–8, 10–15 Level K M3 L4–8
	Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.		Level 1 M1 L19–20 Level 1 M2 L15–18 Level 2 M2 L8–12 Level 2 M3 L3–7 Level 2 M4 L17–19
	Evaluate different ways of observing and measuring a phenomenon to determine which way can answer the question being studied.		Level K M4 L3–5
	Make observations (firsthand or from media) and measurements 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

SEP4: Analyzing and Interpreting Data			
SCI.SEP4: Students *analyze and interpret data*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP4.K–2	Students collect, record, and share observations. This includes the following:		**Aligned *PhD Science* Lessons**
	Record information (observations, thoughts, and ideas).		Level K M1 L4–7, 22–24 Level K M2 L4–6, 21–23 Level K M3 L1–3, 9–16 Level K M4 L14–16
	Use and share pictures, drawings, or writings of observations.		Level K M2 L7–8 Level K M4 L1–2, 6–7, 10, 14–17, 20–24, 26–28
	Use observations (firsthand or from media) to describe patterns or relationships in the natural and designed worlds in order to answer scientific questions and solve problems.		Level K M3 L4–8, 14–20, 22–26 Level K M4 L25
	Compare predictions (based on prior experiences) to what occurred (observable events).		Level K M4 L14–16
	Analyze data from tests of an object or tool to determine if the object or tool works as intended.		Level K M4 L20–24
SEP5: Using Mathematics and Computational Thinking			
SCI.SEP5: Students use *mathematics and computational thinking*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP5.K–2	Students recognize that mathematics can be used to describe the natural and designed world. This includes the following:		**Aligned *PhD Science* Lessons**
	Use counting and numbers to identify and describe patterns in the natural and designed worlds.		Level K M1 L17–21, 25–30 Level K M2 L17–20
	Describe, measure, or compare quantitative attributes of different objects and display the data using simple graphs.		Level 2 M1 L20–22 Level 2 M3 L8–11, 23–29 Level 2 M4 L17–19
	Use qualitative and/or quantitative data to compare two alternative solutions to a problem.		Level 1 M3 L21–25 Level 2 M2 L14–17

SEP 6: Constructing Explanations and Designing Solutions			
SCI.SEP6: Students *construct explanations and design solutions*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SEP6.A: Constructing Explanations			**Aligned *PhD Science* Lessons**
SCI.SEP6.A.K–2	Students use evidence and ideas in constructing evidence-based accounts of natural phenomena. This includes the following: Use information from observations (firsthand and from media) to construct an evidence-based account for natural phenomena.		Level K M3 L4–16, 23–29
SEP6.B: Designing Solutions			**Aligned *PhD Science* Lessons**
SCI.SEP6.B.K–2	Students use evidence and ideas in designing solutions. This includes the following:		
	Use tools and materials to design and/or build a device that solves a specific problem or a solution to a specific problem.		Level K M2 L17–20
	Generate and compare multiple solutions to a problem.		Level 1 M3 L21–25 Level 2 M2 L8–12, 14–17
SEP7: Engaging in Argument from Evidence			
SCI.SEP7: Students *engage in argument from evidence*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP7.K–2	Students compare ideas and representations about the natural and designed world. This includes the following:		**Aligned *PhD Science* Lessons**
	Identify arguments that are supported by evidence.		Level K M3 L17–18
	Distinguish between explanations that account for all gathered evidence and those that do not.		Level 1 M3 L4–6 Level 1 M4 L14–18
	Analyze why some evidence is relevant to a scientific question and some is not.		Level K M4 L25
	Distinguish between opinions and evidence in one's own explanations.		Level K M3 L17–18
	Listen actively to arguments to indicate agreement or disagreement based on evidence, or to retell the main points of the argument.		Level K M3 L17–20 Level K M4 L3–5, 11–13
	Construct an argument with evidence to support a claim.		Level K M3 L17–21, 27–29
	Make a claim about the effectiveness of an object, tool, or solution that is supported by relevant evidence.		Level 1 M3 L8–9, 18–20 Level 2 M3 L14–18, 21–22

SEP8: Obtaining, Evaluating, and Communicating Information			
SCI.SEP8: Students *obtain, evaluate, and communicate information*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP8.K–2	Students use observations and texts to communicate new information. This includes the following:		**Aligned *PhD Science* Lessons**
	Read developmentally appropriate texts or use media to obtain scientific and technical information. Use the information to determine patterns in or evidence about the natural and designed worlds.		Level K M4 L1–2, 6–10, 14–16, 18–19
	Describe how specific images (e.g., a diagram showing how a machine works) support a scientific or engineering idea.		Level 1 M4 L14–18, 23–25 Level 2 M3 L14–18
	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 scientific questions or supporting scientific claims.		Level K M3 L23–26
	Communicate information or design ideas and solutions with others in oral or written forms. Use models, drawings, writing, or numbers that provide detail about scientific ideas, practices, or design 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

Wisconsin Standards for Science Correlation to *PhD Science*®

Green indicates that *PhD Science*® fully addresses the standard within the grade level or the K–2 grade band.

Blue indicates that *PhD Science* covers the standard but in a different grade band.

Yellow indicates that *PhD Science* partially covers the standard within the grade level or grade band.

Red indicates that *PhD Science* does not cover the standard within the grade level or grade band.

Key: Module (M), Lesson (L)

PhD Science Level 1

The Grade 1 Wisconsin Standards for Science are fully covered by the *PhD Science* K–2 curriculum. A detailed analysis of alignment appears in the table below.

Grade 1 Standards, Learning Priorities, and Performance Indicators

Disciplinary Core Ideas			
Life Science (SCI.LS)			
LS1 Structures and Processes			
SCI.LS1: Students use science and engineering practices, crosscutting concepts, and an understanding of *structures and processes (on a scale from molecules to organisms)* to make sense of phenomena and solve problems.			
SCI.LS1.A: Structure and Function			**Aligned *PhD Science* Lessons**
SCI.LS1.A.1	All organisms have external parts that they use to perform daily functions.		Level 1 M1 L1–15, 27–29
SCI.LS1.B: Growth and Development of Organisms			**Aligned *PhD Science* Lessons**
SCI.LS1.B.1	Parents and offspring often engage in behaviors that help the offspring survive.		Level 1 M1 L24–29
SCI.LS1.D: Information Processing			**Aligned *PhD Science* Lessons**
SCI.LS1.D.1	Animals sense and communicate information and respond to inputs with behaviors that help them grow and survive.		Level 1 M1 L16–21, 27–29

LS3 Heredity			
SCI.LS3: Students use science and engineering practices, crosscutting concepts, and an understanding of *heredity* to make sense of phenomena and solve problems.			
SCI.LS3.A: Inheritance of Traits			**Aligned *PhD Science* Lessons**
SCI.LS3.A.1	Young organisms are very much, but not exactly, like their parents, and also resemble other organisms of the same kind.		Level 1 M1 L22–23, 26–29
SCI.LS3.B: Variation of Traits			**Aligned *PhD Science* Lessons**
SCI.LS3.B.1	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

Physical Science (SCI.PS)			
PS4 Waves and Their Applications in Technologies for Information Transfer			
SCI.PS4: Students use science and engineering practices, crosscutting concepts, and an understanding of *waves and their applications in technologies for information transfer* to make sense of phenomena and solve problems.			
SCI.PS4.A: Wave Properties			**Aligned *PhD Science* Lessons**
SCI.PS4.A.1	Sound can make matter vibrate, and vibrating matter can make sound.		Level 1 M3 L1–17, 26–29
SCI.PS4.B: Electromagnetic Radiation			**Aligned *PhD Science* Lessons**
SCI.PS4.B.1	Objects can be seen only when light is available to illuminate them.		Level 1 M2 L1–9, 21–23
SCI.PS4.C: Information Technologies and Instrumentation			**Aligned *PhD Science* Lessons**
SCI.PS4.C.1	People use devices to send and receive information.		Level 1 M3 L18–29

Earth and Space Science (SCI.ESS)			
ESS1 Earth's Place in the Universe			
SCI.ESS1: Students use science and engineering practices, crosscutting concepts, and an understanding of *Earth's place in the universe* to make sense of phenomena and solve problems.			
SCI.ESS1.A: The Universe and Its Stars			**Aligned *PhD Science* Lessons**
SCI.ESS1.A.1	Patterns of movement of the sun, moon, and stars, as seen from Earth, can be observed, described, and predicted.		Level 1 M4 L1–8, 14–25

SCI.ESS1.B: Earth and the Solar System			Aligned *PhD Science* Lessons
SCI.ESS1.B.1	Seasonal patterns of sunrise and sunset can be observed, described, and predicted.		Level 1 M4 L9–13, 23–25
Engineering, Technology, and the Application of Science (SCI.ETS)			
ETS1 Engineering Design			
SCI.ETS1: Students use science and engineering practices, crosscutting concepts, and an understanding of *engineering design* to make sense of phenomena and solve problems.			
SCI.ETS1.A: Defining and Delimiting Engineering Problems			**Aligned *PhD Science* Lessons**
SCI.ETS1.A.K–2	A situation that people want to change or create can be approached as a problem to be solved through engineering.		Level 1 M1 L11–15
	Asking questions, making observations, and gathering information are helpful in thinking about problems.		Level 1 M1 L11–15
	Before beginning to design a solution, it is important to clearly understand the problem.		Level 1 M1 L11–15
SCI.ETS1.B: Developing Possible Solutions			**Aligned *PhD Science* Lessons**
SCI.ETS1.B.K–2	Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.		Level 1 M3 L21–25
ETS2 Links Among Engineering, Technology, Science, and Society			
SCI.ETS2: Students use science and engineering practices, crosscutting concepts, and an understanding of *links among engineering, technology, science, and society* to make sense of phenomena and solve problems.			
SCI.ETS2.A: Interdependence of Science, Engineering, and Technology			**Aligned *PhD Science* Lessons**
SCI.ETS2.A.K–2	Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.		Level 1 M3 L21–25
SCI.ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World			**Aligned *PhD Science* Lessons**
SCI.ETS2.B.K–2	Every human-made product is designed by applying some knowledge of the natural world and is built by using natural materials.		Level 1 M1 L10–15
	Taking natural materials to make things impacts the environment.		Level 1 M1 L10–15

ETS3 Nature of Science and Engineering			
SCI.ETS3: Students use science and engineering practices, crosscutting concepts, and an understanding of the *nature of science and engineering* to make sense of phenomena and solve problems.			
SCI.ETS3.A: Science and Engineering Are Human Endeavors			**Aligned *PhD Science* Lessons**
SCI.ETS3.A.K–2	People of diverse backgrounds can become scientists and engineers.		Level K M3 L14–16
	People have practiced science and engineering for a long time.		Level 1 M4 L7–8
	Creativity and imagination are important to science and engineering.		Level 1 M1 L11–15 Level 1 M2 L15–18 Level 1 M3 L21–25 Level 1 M4 L9–13
SCI.ETS3.B: Science and Engineering Are Unique Ways of Thinking with Different Purposes			**Aligned *PhD Science* Lessons**
SCI.ETS3.B.K–2	Scientists use evidence to explain the natural world.		Level 1 M4 L4–6
	Science assumes natural events happen today as they happened in the past.		Level 1 M4 L9–13
	Engineers solve problems to meet the needs of people and communities.		Level 1 M3 L21–25
SCI.ETS3.C: Science and Engineering Use Multiple Approaches to Create New Knowledge and Solve Problems			**Aligned *PhD Science* Lessons**
SCI.ETS3.C.K–2	Science and engineers use many approaches to answer questions about the natural world and solve problems.		Level K M3 L1–3 Level K M4 L25
	Scientific explanations are strengthened by being supported with evidence.		Level K M2 L4–6, 9 Level K M4 L25
	An engineering problem can have many solutions. The strength of a solution depends on how well it solves the problem.		Level 1 M1 L11–15 Level 1 M2 L15–18 Level 1 M3 L21–25 Level 1 M4 L9–13

Three-Dimensional Performance Indicators			
Life Science (SCI.LS)			
LS1	**Structures and Processes**		**Aligned PhD Science Lessons**
1-LS1-1	Use materials to design a solution to a human problem by mimicking how plants or animals use their external parts to help them survive, grow, and meet their needs.		Level 1 M1 L1–21, 27–29
1-LS1-2	Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.		Level 1 M1 L24–29
1-LS3-1	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

Physical Science (SCI.PS)			
PS4 Waves and Their Applications in Technologies for Information Transfer			**Aligned *PhD Science* Lessons**
1-PS4-1	Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.		Level 1 M3 L1–17, 26–29
1-PS4-2	Make observations to construct an evidence-based account that objects can be seen only when illuminated.		Level 1 M2 L1–9, 21–23
1-PS4-3	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
1-PS4-4	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

Earth and Space Science (SCI.ESS)			
ESS1 Earth's Place in the Universe			**Aligned *PhD Science* Lessons**
1-ESS1-1	Use observations of the sun, moon, and stars to describe patterns that can be predicted.		Level 1 M4 L1–8, 14–25
1-ESS1-2	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

Engineering, Technology, and the Application of Science (SCI.ETS)			
ETS1	**Engineering Design**		**Aligned PhD Science Lessons**
K–2-ETS1-1	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.		Level 1 M1 L11–15
K–2-ETS1-2	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.		Level 1 M3 L21–25
K–2-ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.		Level 1 M3 L21–25
ETS3	**Nature of Science and Engineering**		**Aligned PhD Science Lessons**
1-ETS3-1	Construct an argument with evidence that humans today and long ago have used ideas from plants and animals to help them survive.		Level 1 M1 L1–21, 27–29

Crosscutting Concept Standards and Learning Priorities			
CC1: Patterns			
SCI.CC1: Students use science and engineering practices, disciplinary core ideas, and *patterns* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC1.K–2	Students recognize that 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
CC2: Cause and Effect			
SCI.CC2: Students use science and engineering practices, disciplinary core ideas, and *cause and effect* relationships to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC2.K–2	Students learn that events have causes that generate observable patterns. They design simple tests to gather evidence to support or refute their own ideas about causes.		Level 1 M2 L1–7, 10–12, 13–23 Level 1 M3 L4–6, 7, 14, 15–17, 26–29 Level 1 M4 L4–6, 9–13, 17–21, 23–25
CC3: Scale, Proportion, and Quantity			
SCI.CC3: Students use science and engineering practices, disciplinary core ideas, and an understanding of *scale, proportion, and quantity* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC3.K–2	Students use relative scales (e.g., bigger and smaller; hotter and colder; faster and slower) to describe objects. They use standard units to measure length.		Level K M1 L1–7, 10–24, 28–30 Level K M2 L7–9, 13–15, 21–23 Level K M3 L1–3 Level K M4 L25 Level 2 M3 L3–6, 14–18, 25–29
CC4: Systems and Systems Models			
SCI.CC4: Students use science and engineering practices, disciplinary core ideas, and an understanding of *systems and system models* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC4.K–2	Students understand objects and organisms can be described in terms of their parts and that systems in the natural and designed world have parts that work together.		Level 1 M1 L1–8, 16–17 Level 1 M2 L1–3, 10–23 Level 1 M3 L1–3, 8–10, 14, 21–29

CC5: Energy and Matter			
SCI.CC5: Students use science and engineering practices, disciplinary core ideas, and an understanding of *energy and matter* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC5.K–2	Students observe objects may break into smaller pieces, be put together into larger pieces, or change shapes.		Level 2 M1 L10–11, 29–31 Level 2 M2 L3–4, 8–13, 22–24
CC6: Structure and Function			
SCI.CC6: Students use science and engineering practices, disciplinary core ideas, and an understanding of *structure and function* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC6.K–2	Students observe 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
CC7: Stability and Change			
SCI.CC7: Students use science and engineering practices, disciplinary core ideas, and an understanding of *stability and change* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC7.K–2	Students observe some things stay the same while other things change, and things may change slowly or rapidly.		Level K M1 L8–9, 17–21 Level K M4 L14–16 Level 2 M2 L1–2, 18–24 Level 2 M3 L1–2, 25–29

Science and Engineering Practice Standards and Learning Priorities			
SEP1: Asking Questions and Defining Problems			
SCI.SEP1: Students *ask questions and define problems*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SEP1.A: Asking Questions			
SCI.SEP1.A.K–2	Students ask simple descriptive questions that can be tested. This includes the following:		**Aligned *PhD Science* Lessons**
	Ask questions based on observations to find more information about the natural world.		Level 1 M1 L1–3 Level 1 M2 L1–3 Level 1 M3 L1–3 Level 1 M4 L1–3, 14–16
	Ask or identify questions that can be answered by an investigation.		Level K M1 L8–9 Level K M3 L4–8, 22 Level 2 M3 L3–6
SEP1.B: Defining Problems			**Aligned *PhD Science* Lessons**
SCI.SEP1.B.K–2	Students define simple problems that can be solved through the development of a new or improved object or tool.		Level 1 M1 L11–15

SEP2: Developing and Using Models			
SCI.SEP2: Students *develop and use models*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP2.K–2	Students use and develop models (i.e., diagrams, drawings, physical replicas, dioramas, dramatizations, or storyboards) that represent concrete events or design solutions. This includes the following:		**Aligned *PhD Science* Lessons**
	Distinguish between a model and the actual object, process, or events the model represents.		Level 1 M1 L4–9, 18 Level 1 M3 L14
	Compare models to identify common features and differences.		Level 1 M1 L11–15 Level 1 M2 L1–3
	Develop or use models to represent amounts, relationships, relative scales (bigger, smaller), and patterns in the natural and designed world(s).		Level 1 M1 L1–8 Level 1 M2 L1–7, 10–23 Level 1 M3 L7, 11–13 Level 1 M4 L1–3, 7–8
	Develop a simple model based on evidence to represent a proposed object or tool.		Level 1 M1 L11–15
SEP3: Planning and Conducting Investigations			
SCI.SEP3: Students *plan and conduct investigations*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP3.K–2	Students plan and carry out simple investigations, based on fair tests, which provide data to support explanations or design solutions. This includes the following:		**Aligned *PhD Science* Lessons**
	With guidance, plan and conduct an investigation in collaboration with peers.		Level K M2 L7–8, 10–15 Level K M3 L4–8
	Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.		Level 1 M1 L19–20 Level 1 M2 L15–18
	Evaluate different ways of observing and measuring a phenomenon to determine which way can answer the question being studied.		Level K M4 L3–5
	Make observations (firsthand or from media) and measurements to collect data that can be used to make comparisons.		Level 1 M2 L4–12, 15–18, 20–23 Level 1 M3 L1–7, 11–13, 18–19 Level 1 M4 L4–6, 14–16, 19–21
	Make observations (firsthand or from media) and measurements of a proposed object or tool or solution to determine if it solves a problem or meets a goal.		Level 1 M3 L8–9, 20–25

SEP4: Analyzing and Interpreting Data			
SCI.SEP4: Students *analyze and interpret data*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP4.K–2	Students collect, record, and share observations. This includes the following:		**Aligned *PhD Science* Lessons**
	Record information (observations, thoughts, and ideas).		Level 1 M1 L10
	Use and share pictures, drawings, or writings of observations.		Level K M2 L7–8 Level K M4 L1–2, 6–7, 10, 14–17, 20–24, 26–28
	Use observations (firsthand or from media) to describe patterns or relationships in the natural and designed worlds in order to answer scientific questions and solve problems.		Level 1 M1 L16–21, 27–29 Level 1 M2 L1–9 Level 1 M3 L10 Level 1 M4 L4–6, 9–13
	Compare predictions (based on prior experiences) to what occurred (observable events).		Level 1 M3 L11–13, 15–16, 26–29
	Analyze data from tests of an object or tool to determine if the object or tool works as intended.		Level 1 M3 L8–9
SEP5: Using Mathematics and Computational Thinking			
SCI.SEP5: Students use *mathematics and computational thinking*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP5.K–2	Students recognize that mathematics can be used to describe the natural and designed world. This includes the following:		**Aligned *PhD Science* Lessons**
	Use counting and numbers to identify and describe patterns in the natural and designed worlds.		Level K M1 L17–21, 25–27, 28–30 Level K M2 L17–20 Level 2 M4 L7–8, 20–22
	Describe, measure, or compare quantitative attributes of different objects and display the data using simple graphs.		Level 2 M1 L20–22 Level 2 M3 L8–11, 23–29 Level 2 M4 L17–19
	Use qualitative and/or quantitative data to compare two alternative solutions to a problem.		Level 1 M3 L21–25

SEP 6: Constructing Explanations and Designing Solutions			
SCI.SEP6: Students *construct explanations and design solutions*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SEP6.A: Constructing Explanations			**Aligned *PhD Science* Lessons**
SCI.SEP6.A.K–2	Students use evidence and ideas in constructing evidence-based accounts of natural phenomena. This includes the following: Use information from observations (firsthand and 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
SEP6.B: Designing Solutions			**Aligned *PhD Science* Lessons**
SCI.SEP6.B.K–2	Students use evidence and ideas in designing solutions. This includes the following:		
	Use tools and materials to design and/or build a device that solves a specific problem or a solution to a specific problem.		Level 1 M1 L11–15
	Generate and compare multiple solutions to a problem.		Level 1 M3 L21–25
SEP7: Engaging in Argument from Evidence			
SCI.SEP7: Students *engage in argument from evidence*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP7.K–2	Students compare ideas and representations about the natural and designed world. This includes the following:		**Aligned *PhD Science* Lessons**
	Identify arguments that are supported by evidence.		Level 1 M1 L11–15
	Distinguish between explanations that account for all gathered evidence and those that do not.		Level 1 M3 L21–25
	Analyze why some evidence is relevant to a scientific question and some is not.		Level 1 M1 L11–15
	Distinguish between opinions and evidence in one's own explanations.		Level 1 M3 L21–25
	Listen actively to arguments to indicate agreement or disagreement based on evidence or to retell the main points of the argument.		Level 1 M1 L11–15
	Construct an argument with evidence to support a claim.		Level 1 M4 L9–13, 19–21
	Make a claim about the effectiveness of an object, tool, or solution that is supported by relevant evidence.		Level 1 M3 L8–9, 18–20

SEP8: Obtaining, Evaluating, and Communicating Information			
SCI.SEP8: Students *obtain, evaluate, and communicate information*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP8.K–2	Students use observations and texts to communicate new information. This includes the following:		**Aligned *PhD Science* Lessons**
	Read developmentally appropriate texts or use media to obtain scientific and technical information. Use the information to determine patterns in or evidence about the natural and designed worlds.		Level 1 M1 L24–25 Level 1 M3 L18–19 Level 1 M4 L9–13
	Describe how specific images (e.g., a diagram showing how a machine works) support a scientific or engineering idea.		Level 1 M4 L14–18, 23–25
	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 scientific questions or supporting scientific claims.		Level K M3 L23–26 Level 2 M2 L5–6, 18–19 Level 2 M4 L4–9, 11–16, 23–25
	Communicate information or design ideas and solutions with others in oral or written forms. Use models, drawings, writing, or numbers that provide detail about scientific ideas, practices, or design ideas.		Level 1 M1 L27–29 Level 1 M2 L21–23 Level 1 M3 L26–29 Level 1 M4 L23–25

Wisconsin Standards for Science Correlation to *PhD Science*®

Green indicates that *PhD Science*® fully addresses the standard within the grade level or the K–2 grade band.

Blue indicates that *PhD Science* covers the standard but in a different grade band.

Yellow indicates that *PhD Science* partially covers the standard within the grade level or grade band.

Red indicates that *PhD Science* does not cover the standard within the grade level or grade band.

Key: Module (M), Lesson (L)

PhD Science Level 2

The Grade 2 Wisconsin Standards for Science are fully covered by the *PhD Science* K–2 curriculum. A detailed analysis of alignment appears in the table below.

Grade 2 Standards, Learning Priorities, and Performance Indicators

Disciplinary Core Ideas			
Life Science (SCI.LS)			
LS2 Interactions, Energy, and Dynamics Within Ecosystems			
SCI.LS2: Students use science and engineering practices, crosscutting concepts, and an understanding of *interactions, energy, and dynamics within ecosystems* to make sense of phenomena and solve problems.			
SCI.LS2.A: Interdependent Relationships in Ecosystems			**Aligned *PhD Science* Lessons**
SCI.LS2.A.2	Plants depend on water and light to grow. Plants depend on animals for pollination or to move their seeds around.		Level 2 M3 L1–29

LS4 Biological Evolution			
SCI.LS4: Students use science and engineering practices, crosscutting concepts, and an understanding of *biological evolution* to make sense of phenomena and solve problems.			
SCI.LS4.D: Biodiversity and Humans			**Aligned *PhD Science* Lessons**
SCI.LS4.D.2	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

Physical Science (SCI.PS)			
PS1 Matter and Its Interactions			
SCI.PS1: Students use science and engineering practices, crosscutting concepts, and an understanding of *matter and its interactions* to make sense of phenomena and solve problems.			
SCI.PS1.A: Structures and Properties of Matter			**Aligned *PhD Science* Lessons**
SCI.PS1.A.2	Matter exists as different substances that have different observable properties. Different properties are suited to different purposes. Objects can be built up from smaller parts.		Level 2 M1 L1–16, 19, 23, 24–31 Level 2 M2 L3–4, 14–17
SCI.PS1.B: Chemical Reactions			**Aligned *PhD Science* Lessons**
SCI.PS1.B.2	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

Earth and Space Science (SCI.ESS)			
ESS1 Earth's Place in the Universe			
SCI.ESS1: Students use science and engineering practices, crosscutting concepts, and an understanding of *Earth's place in the universe* to make sense of phenomena and solve problems.			
SCI.ESS1.C: The History of Planet Earth			**Aligned *PhD Science* Lessons**
SCI.ESS1.C.2	Some events on Earth occur very quickly; others can occur very slowly.		Level 2 M2 L18–24

ESS2 Earth's Systems			
SCI.ESS2: Students use science and engineering practices, crosscutting concepts, and an understanding of *Earth's systems* to make sense of phenomena and solve problems.			
SCI.ESS2.A: Earth Materials and Systems			**Aligned *PhD Science* Lessons**
SCI.ESS2.A.2	Wind and water change the shape of the land.		Level 2 M2 L1–17, 20, 22–24
SCI.ESS2.B: Plate Tectonics and Large-Scale System Interactions			**Aligned *PhD Science* Lessons**
SCI.ESS2.B.2	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
SCI.ESS2.C: The Roles of Water in Earth's Surface Processes			**Aligned *PhD Science* Lessons**
SCI.ESS2.C.2	Water is found in many types of places and in different forms on Earth.		Level 2 M4 L1–6, 16, 22–25

Engineering, Technology, and the Application of Science (SCI.ETS)			
ETS1 Engineering Design			
SCI.ETS1: Students use science and engineering practices, crosscutting concepts, and an understanding of *engineering design* to make sense of phenomena and solve problems.			
SCI.ETS1.A: Defining and Delimiting Engineering Problems			**Aligned *PhD Science* Lessons**
SCI.ETS1.A.K–2	A situation that people want to change or create can be approached as a problem to be solved through engineering.		Level 2 M1 L24–28 Level 2 M2 L8–12
	Asking questions, making observations, and gathering information are helpful in thinking about problems.		Level 2 M1 L24–28
	Before beginning to design a solution, it is important to clearly understand the problem.		Level 2 M1 L24–28
SCI.ETS1.B: Developing Possible Solutions			**Aligned *PhD Science* Lessons**
SCI.ETS1.B.K–2	Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.		Level 2 M3 L14–18
SCI.ETS1.C: Optimizing the Design Solution			**Aligned *PhD Science* Lessons**
SCI.ETS1.C.2	Because there is more than one possible solution to a problem, it is useful to compare and test designs.		Level 2 M2 L8–12, 14–17

ETS2 Links Among Engineering, Technology, Science, and Society			
SCI.ETS2: Students use science and engineering practices, crosscutting concepts, and an understanding of *links among engineering, technology, science, and society* to make sense of phenomena and solve problems.			
SCI.ETS2.A: Interdependence of Science, Engineering, and Technology			**Aligned *PhD Science* Lessons**
SCI.ETS2.A.K–2	Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.		Level 2 M3 L14–18
SCI.ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World			**Aligned *PhD Science* Lessons**
SCI.ETS2.B.K–2	Every human-made product is designed by applying some knowledge of the natural world and is built by using natural materials.		Level 2 M2 L14–17 Level 2 M3 L14–18
	Taking natural materials to make things impacts the environment.		Level 2 M2 L14–17 Level 2 M3 L14–18
ETS3 Nature of Science and Engineering			
SCI.ETS3: Students use science and engineering practices, crosscutting concepts, and an understanding of the *nature of science and engineering* to make sense of phenomena and solve problems.			
SCI.ETS3.A: Science and Engineering Are Human Endeavors			**Aligned *PhD Science* Lessons**
SCI.ETS3.A.K–2	People of diverse backgrounds can become scientists and engineers.		Level K M3 L14–16
	People have practiced science and engineering for a long time.		Level K M3 L14–16 Level 1 M4 L7–8
	Creativity and imagination are important to science and engineering.		Level 2 M1 L24–28 Level 2 M2 L14–17 Level 2 M3 L14–18 Level 2 M4 L17–19
SCI.ETS3.B: Science and Engineering Are Unique Ways of Thinking with Different Purposes			**Aligned *PhD Science* Lessons**
SCI.ETS3.B.K–2	Scientists use evidence to explain the natural world.		Level 1 M4 L4–6
	Science assumes natural events happen today as they happened in the past.		Level 2 M2 L20–21
	Engineers solve problems to meet the needs of people and communities.		Level 2 M1 L24–28 Level 2 M2 L14–17 Level 2 M3 L14–18

SCI.ETS3.C: Science and Engineering Use Multiple Approaches to Create New Knowledge and Solve Problems			Aligned *PhD Science* Lessons
SCI.ETS3.C.K–2	Science and engineers use many approaches to answer questions about the natural world and solve problems.		Level K M3 L1–3 Level K M4 L25
	Scientific explanations are strengthened by being supported with evidence.		Level K M2 L4–6, 9 Level K M4 L25
	An engineering problem can have many solutions. The strength of a solution depends on how well it solves the problem.		Level 2 M1 L24–28 Level 2 M2 L14–17 Level 2 M3 L14–18

Three-Dimensional Performance Indicators			
Life Science (SCI.LS)			
LS2	**Interactions, Energy, and Dynamics Within Ecosystems**		**Aligned PhD Science Lessons**
2-LS2-1	Plan and conduct an investigation to determine if plants need sunlight and water to grow.		Level 2 M3 L1–7, 25–29
2-LS2-2	Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.		Level 2 M3 L8–29
LS4	**Biodiversity and Humans**		**Aligned PhD Science Lessons**
2-LS4-1	Make observations of plants and animals to compare the diversity of life in different habitats.		Level 2 M4 L1–3, 7–25

Physical Science (SCI.PS)			
PS1	**Matter and Its Interactions**		**Aligned PhD Science Lessons**
2-PS1-1	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
2-PS1-2	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

2-PS1-3	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
2-PS1-4	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
Earth and Space Science (SCI.ESS)			
ESS1	**Earth's Place in the Universe**		**Aligned PhD Science Lessons**
2-ESS1-1	Use information from several sources to provide evidence that Earth events can occur quickly or slowly.		Level 2 M2 L18–24
ESS2	**Earth's Systems**		**Aligned PhD Science Lessons**
2-ESS2-1	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
2-ESS2-2	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
2-ESS2-3	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

Engineering, Technology, and the Application of Science (SCI.ETS)			
ETS1	**Engineering Design**		**Aligned PhD Science Lessons**
K–2-ETS1-1	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.		Level 2 M1 L24–28 Level 2 M2 L8–12
K–2-ETS1-2	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.		Level 2 M3 L14–18
K–2-ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.		Level 2 M2 L8–12, 14–17
ETS3	**Nature of Science and Engineering**		**Aligned PhD Science Lessons**
2-ETS3-1	Design creative solutions to a problem caused when there is a quick change to the earth's surface (e.g. natural disasters).		Level 2 M2 L14–17

Crosscutting Concept Standards and Learning Priorities			
CC1: Patterns			
SCI.CC1: Students use science and engineering practices, disciplinary core ideas, and *patterns* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC1.K–2	Students recognize that patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.		Level 2 M1 L4–9 Level 2 M2 L1–2, 5–6 Level 2 M4 L1–8, 11–15, 20–21, 23–25
CC2: Cause and Effect			
SCI.CC2: Students use science and engineering practices, disciplinary core ideas, and *cause and effect* relationships to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC2.K–2	Students learn that events have causes that generate observable patterns. They design simple tests to gather evidence to support or refute their own ideas about causes.		Level 2 M1 L14–19, 29–31 Level 2 M2 L8–12, 20–21 Level 2 M3 L3–11
CC3: Scale, Proportion, and Quantity			
SCI.CC3: Students use science and engineering practices, disciplinary core ideas, and an understanding of *scale, proportion, and quantity* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC3.K–2	Students use relative scales (e.g., bigger and smaller; hotter and colder; faster and slower) to describe objects. They use standard units to measure length.		Level 2 M1 L8–9 Level 2 M2 L18–21 Level 2 M3 L3–6, 14–18, 25–29 Level 2 M4 L1–6, 17–19, 22–25
CC4: Systems and Systems Models			
SCI.CC4: Students use science and engineering practices, disciplinary core ideas, and an understanding of *systems and system models* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC4.K–2	Students understand objects and organisms can be described in terms of their parts and that systems in the natural and designed world have parts that work together.		Level 2 M1 L1–7, 12–13, 20–23, 29–31 Level 2 M2 L3–4, 7–12, 14–17 Level 2 M3 L8–13, 19–24 Level 2 M4 L7–16, 23–25

CC5: Energy and Matter			
SCI.CC5: Students use science and engineering practices, disciplinary core ideas, and an understanding of *energy and matter* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC5.K–2	Students observe objects may break into smaller pieces, be put together into larger pieces, or change shapes.		Level 2 M1 L10–11, 29–31 Level 2 M2 L3–4, 8–13, 22–24
CC6: Structure and Function			
SCI.CC6: Students use science and engineering practices, disciplinary core ideas, and an understanding of *structure and function* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC6.K–2	Students observe 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
CC7: Stability and Change			
SCI.CC7: Students use science and engineering practices, disciplinary core ideas, and an understanding of *stability and change* to make sense of phenomena and solve problems.			**Aligned *PhD Science* Lessons**
SCI.CC7.K–2	Students observe some things stay the same while other things change, and things may change slowly or rapidly.		Level 2 M2 L1–2, 18–24 Level 2 M3 L1–2, 25–29

Science and Engineering Practice Standards and Learning Priorities			
SEP1: Asking Questions and Defining Problems			
SCI.SEP1: Students *ask questions and define problems*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SEP1.A: Asking Questions			
SCI.SEP1.A.K–2	Students ask simple descriptive questions that can be tested. This includes the following:		**Aligned *PhD Science* Lessons**
	Ask questions based on observations to find more information about the natural world.		Level 2 M1 L1–3 Level 2 M2 L1–2 Level 2 M3 L1–2 Level 2 M4 L1–3
	Ask or identify questions that can be answered by an investigation.		Level 2 M3 L3–6
SEP1.B: Defining Problems			**Aligned *PhD Science* Lessons**
SCI.SEP1.B.K–2	Students define simple problems that can be solved through the development of a new or improved object or tool.		Level 2 M3 L14–18
SEP2: Developing and Using Models			
SCI.SEP2: Students *develop and use models*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP2.K–2	Students use and develop models (i.e., diagrams, drawings, physical replicas, dioramas, dramatizations, or storyboards) that represent concrete events or design solutions. This includes the following:		**Aligned *PhD Science* Lessons**
	Distinguish between a model and the actual object, process, or events the model represents.		Level 2 M4 L4–6
	Compare models to identify common features and differences.		Level 2 M4 L1–6, 20–21, 23–25
	Develop or use models to represent amounts, relationships, relative scales (bigger, smaller), and patterns in the natural and designed world(s).		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
	Develop a simple model based on evidence to represent a proposed object or tool.		Level 2 M3 L14–18

SEP3: Planning and Conducting Investigations			
SCI.SEP3: Students *plan and conduct investigations*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP3.K–2	Students plan and carry out simple investigations, based on fair tests, which provide data to support explanations or design solutions. This includes the following:		**Aligned *PhD Science* Lessons**
	With guidance, plan and conduct an investigation in collaboration with peers.		Level K M2 L7–8, 10–15 Level K M3 L4–8
	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
	Evaluate different ways of observing and measuring a phenomenon to determine which way can answer the question being studied.		Level K M4 L3–5
	Make observations (firsthand or from media) and measurements 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

SEP4: Analyzing and Interpreting Data			
SCI.SEP4: Students *analyze and interpret data*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP4.K–2	Students collect, record, and share observations. This includes the following:		**Aligned *PhD Science* Lessons**
	Record information (observations, thoughts, and ideas).		Level 2 M1 L4–7, 10–11, 14–18
	Use and share pictures, drawings, or writings of observations.		Level K M2 L7–8 Level K M4 L1–2, 6–7, 10, 14–17, 20–24, 26–28
	Use observations (firsthand or from media) to describe patterns or relationships in the natural and designed worlds in order to answer scientific questions and solve problems.		Level 2 M1 L4–11 Level 2 M2 L5–6, 8–9 Level 2 M3 L19–20 Level 2 M4 L22–25
	Compare predictions (based on prior experiences) to what occurred (observable events).		Level K M4 14–16 Level 1 M3 L11–13, 15–16, 26–29
	Analyze data from tests of an object or tool to determine if the object or tool works as intended.		Level 2 M1 L20–22, 24–28 Level 2 M3 L14–18
SEP5: Using Mathematics and Computational Thinking			
SCI.SEP5: Students use *mathematics and computational thinking*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP5.K–2	Students recognize that mathematics can be used to describe the natural and designed world. This includes the following:		**Aligned *PhD Science* Lessons**
	Use counting and numbers to identify and describe patterns in the natural and designed worlds.		Level 2 M4 L7–8, 20–22
	Describe, measure, or compare quantitative attributes of different objects and display the data using simple graphs.		Level 2 M1 L20–22 Level 2 M3 L8–11, 23–29 Level 2 M4 L17–19
	Use qualitative and/or quantitative data to compare two alternative solutions to a problem.		Level 2 M2 L14–17

SEP 6: Constructing Explanations and Designing Solutions			
SCI.SEP6: Students *construct explanations and design solutions*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SEP6.A: Constructing Explanations			**Aligned *PhD Science* Lessons**
SCI.SEP6.A.K–2	Students use evidence and ideas in constructing evidence-based accounts of natural phenomena. This includes the following: Use information from observations (firsthand and from media) 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
SEP6.B: Designing Solutions			**Aligned *PhD Science* Lessons**
SCI.SEP6.B.K–2	Students use evidence and ideas in designing solutions. This includes the following:		
	Use tools and materials to design and/or build a device that solves a specific problem or a solution to a specific problem.		Level 2 M1 L24–28
	Generate and compare multiple solutions to a problem.		Level 2 M2 L8–12, 14–17
SEP7: Engaging in Argument from Evidence			
SCI.SEP7: Students *engage in argument from evidence*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP7.K–2	Students compare ideas and representations about the natural and designed world. This includes the following:		**Aligned *PhD Science* Lessons**
	Identify arguments that are supported by evidence.		Level K M3 L17–18 Level 1 M4 L4–8, 23–25
	Distinguish between explanations that account for all gathered evidence and those that do not.		Level 1 M3 L4–6 Level 1 M4 14–18
	Analyze why some evidence is relevant to a scientific question and some is not.		Level 2 M4 L20–21
	Distinguish between opinions and evidence in one's own explanations.		Level K M3 L17–18 Level 1 M4 L9–13
	Listen actively to arguments to indicate agreement or disagreement based on evidence, or to retell the main points of the argument.		Level 2 M2 L20 Level 2 M4 L4–6, 9–13, 23–25
	Construct an argument with evidence to support a claim.		Level 2 M2 L3–4, 10–13, 21–24 Level 2 M4 L16
	Make a claim about the effectiveness of an object, tool, or solution that is supported by relevant evidence.		Level 2 M3 L14–18, 21–22

SEP8: Obtaining, Evaluating, and Communicating Information			
SCI.SEP8: Students *obtain, evaluate, and communicate information*, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.			
SCI.SEP8.K–2	Students use observations and texts to communicate new information. This includes the following:		**Aligned *PhD Science* Lessons**
	Read developmentally appropriate texts or use media to obtain scientific and technical information. Use the information to determine patterns in or evidence about the natural and designed worlds.		Level 2 M2 L1–2, 14–17
	Describe how specific images (e.g., a diagram showing how a machine works) support a scientific or engineering idea.		Level 2 M3 L14–18
	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 scientific questions or supporting scientific claims.		Level 2 M2 L5–6, 18–19 Level 2 M4 L4–9, 11–16, 23–25
	Communicate information or design ideas and solutions with others in oral or written forms. Use models, drawings, writing, or numbers that provide detail about scientific ideas, practices, or design ideas.		Level 2 M1 L29–31 Level 2 M2 L22–24 Level 2 M3 L8–12, 14–20, 25–29 Level 2 M4 L23–25