

***PhD Science*[®] K–5 Curriculum Correlation to Ohio’s Learning Standards for Science**

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PhD Science® Correlation to Ohio’s Learning Standards for Science: Level K

The *PhD Science* K–5 curriculum aligns with Ohio’s Learning Standards for Science—Kindergarten. A detailed analysis of alignment appears in the table below.

Key: Module (M), Lesson (L)

Kindergarten Standards

Strand: Earth and Space Science (ESS)

Code	Standard Content Statement	Aligned PhD Science Lessons
K.ESS.1	Weather changes are long-term and short-term.	Level K M1 L4–9, 17–27
	Weather changes occur throughout the day and from day to day.	Level K M1 L17–21
	Air is a nonliving substance that surrounds Earth and wind is air that is moving.	Level K M1 L4–9
	Wind, temperature, and precipitation can be used to document short-term weather changes that are observable.	Level K M1 L4–9, 17–27
	Yearly weather changes (seasons) are observable patterns in the daily weather changes.	Level K M1 L4–9, 17–27

Code	Standard Content Statement	Aligned PhD Science Lessons
K.ESS.2	The moon, sun, and stars can be observed at different times of the day or night.	Level 1 M4 L1–25
	The moon, sun, and stars appear in different positions at different times of the day or night. Sometimes the moon is visible during the night, sometimes the moon is visible during the day, and at other times the moon is not visible at all. The observable shape of the moon changes in size very slowly throughout the month. The sun is visible only during the day.	Level 1 M4 L1–8, 14–25
	The sun’s position in the sky appears to change in a single day and from season to season. Stars are visible at night, some are visible in the evening or morning, and some are brighter than others.	Level 1 M4 L1–25

Strand: Physical Science (PS)

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
K.PS.1	Objects and materials can be sorted and described by their properties.	Level 2 M1 L1–9, 12–16, 19, 23, 29–31 Level 2 M2 L3–4, 14–17
	Objects can be sorted and described by the properties of the materials from which they are made. Some of the properties can include color, size, and texture.	Level 2 M1 L1–9, 12–16, 19, 23, 29–31 Level 2 M2 L3–4, 14–17

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
K.PS.2	Some objects and materials can be made to vibrate to produce sound.	Level 1 M3 L1–17, 26–29
	Sound is produced by touching, blowing, or tapping objects. The sounds that are produced vary depending on the properties of objects. Sound is produced when objects vibrate.	Level 1 M3 L1–17, 26–29

Strand: Life Science (LS)

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
K.LS.1	Living things have specific characteristics and traits.	Level 1 M1 L22–23, 26–29
	Living things grow and reproduce. Living things are found worldwide.	Level 1 M1 L22–23, 26–29 Level 2 M4 L1–3, 8–12, 14–16

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
K.LS.2	Living things have physical traits and behaviors, which influence their survival.	Level 1 M1 L22–29
	Living things are made up of a variety of structures. Some traits can be observable structures. Some of these structures and behaviors influence their survival.	Level 1 M1 L22–29 Level 2 M4 L1–3

PhD Science® Correlation to Ohio’s Learning Standards for Science: Level 1

The *PhD Science* K–5 curriculum aligns with Ohio’s Learning Standards for Science—Grade 1. A detailed analysis of alignment appears in the table below.

Key: Module (M), Lesson (L)

Grade 1 Standards

Strand: Earth and Space Science (ESS)

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
1.ESS.1	The sun is the principal source of energy.	Level K M1 L8–16, 28–30
	Sunlight warms Earth’s land, air, and water. The amount of exposure to sunlight affects the amount of warming or cooling of air, water, and land.	Level K M1 L8–16, 28–30

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
1.ESS.2	Water on Earth is present in many forms.	Level 2 M4 L1–6, 16, 22–25
	The physical properties of water can change. These changes occur due to changing energy. Water can change from a liquid to a solid and from a solid to a liquid.	Level 2 M4 L1–6, 16, 22–25

Strand: Physical Science (PS)

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
1.PS.1	Properties of objects and materials can change.	Level 2 M1 L14–19, 29–31
	Objects and materials change when exposed to various conditions, such as heating or cooling. Changes in temperature are a result of changes in energy. Not all materials change in the same way.	Level 2 M1 L14–19, 29–31

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
1.PS.2	Objects can be moved in a variety of ways, such as straight, zigzag, circular, and back and forth.	Level K M2 L7–23
	The position of an object can be described by locating it relative to another object or to the object’s surroundings. An object is in motion when its position is changing.	Level K M2 L1–23
	The motion of an object can be affected by pushing or pulling. A push or pull is a force that can make an object move faster, slower, or go in a different direction. Changes in motion are a result of changes in energy.	Level K M2 L7–23

Strand: Life Science (LS)

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
1.LS.1	Living things have basic needs, which are met by obtaining materials from the physical environment.	Level K M3 L4–16, 19–20, 22, 27–29
	Living things require energy, water, and a particular range of temperatures in their environments. Plants get energy from sunlight. Animals get energy from plants and other animals. Living things acquire resources from the living and nonliving components of the environment.	Level K M3 L4–16, 19–20, 22, 27–29 Level 5 M2 L3–11, 15–19

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
1.LS.2	Living things survive only in environments that meet their needs.	Level 2 M4 L1–3, 7–25
	Resources are necessary to meet the needs of an individual and populations of individuals. Living things interact with their physical environments as they meet those needs.	Level 2 M4 L1–3, 7–25
	Effects of seasonal changes within the local environment directly impact the availability of resources.	Level 1 M4 L9–13, 23–25

PhD Science® Correlation to Ohio’s Learning Standards for Science: Level 2

The *PhD Science* K–5 curriculum aligns with Ohio’s Learning Standards for Science—Grade 2. A detailed analysis of alignment appears in the table below.

Key: Module (M), Lesson (L)

Grade 2 Standards

Strand: Earth and Space Science (ESS)

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
2.ESS.1	The atmosphere is primarily made up of air.	Level K M1 L4–7, 8–9 Level 4 M2 L1–3, 15–16
	Air has properties that can be observed and measured. The transfer of energy in the atmosphere causes air movement, which is felt as wind. Wind speed and direction can be measured.	Level K M1 L4–9 Level 4 M2 L1–3, 15–16

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
2.ESS.2	Water is present in the atmosphere.	Level 5 M3 L4–8, 10–11, 24–27
	Water is present in the atmosphere as water vapor. When water vapor in the atmosphere cools, it forms clouds, fog, rain, ice, snow, sleet, or hail.	Level 5 M3 L4–8, 10–11, 24–27

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
2.ESS.3	Long- and short-term weather changes occur due to changes in energy.	Level 4 M2 L1–5, 10–11, 24–26
	Changes in energy affect all aspects of weather, including temperature, precipitation, and wind.	Level 4 M2 L1–5, 10–11, 24–26

Strand: Physical Science (PS)

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
2.PS.1	Forces change the motion of an object.	Level 3 M4 L10–30
	Motion can increase, change direction, or stop depending on the force applied.	Level 3 M4 L10–18, 28–30
	The change in motion of an object is related to the size of the force.	Level 3 M4 L10–18, 28–30
	Some forces act without touching, such as using a magnet to move an object or objects falling to the ground.	Level 3 M4 L19–30

Strand: Life Science (LS)

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
2.LS.1	Living things cause changes on Earth.	Level K M4 L1–10, 14–16, 26–28
	Living things function and interact with their physical environments. Living things cause changes in the environments where they live; the changes can be very noticeable or slightly noticeable, fast, or slow.	Level K M4 L1–10, 14–16, 26–28

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
2.LS.2	All organisms alive today result from their ancestors, some of which may be extinct. Not all kinds of organisms that lived in the past are represented by living organisms today.	Level 3 M2 L1–8
	Some kinds of organisms become extinct when their basic needs are no longer met or the environment changes.	Level 3 M2 L1–8

PhD Science® Correlation to Ohio’s Learning Standards for Science: K–2 Nature of Science

The *PhD Science* K–2 curriculum aligns with Ohio’s Learning Standards for Science—K–2 Nature of Science elements. A detailed analysis of alignment appears in the table below.

Key: Module (M), Lesson (L)

Nature of Science Grades K–2

Scientific Inquiry, Practice, and Applications	Aligned PhD Science Lessons
Apply knowledge of science content to real-world challenges.	Level K M1 L12–16 Level K M2 L17–20 Level K M4 L20–24 Level 1 M1 L11–15 Level 1 M3 L21–25 Level 2 M1 L24–28 Level 2 M2 L14–17 Level 2 M3 L14–18
Plan and conduct simple scientific investigations using appropriate safety techniques based on explorations, observations, and questions.	Level K M1 L8–9 Level K M3 L4–8 Level 1 M2 L15–18 Level 1 M4 L9–13 Level 2 M1 L24–28 Level 2 M2 L14–17 Level 2 M3 L14–18

Scientific Inquiry, Practice, and Applications (cont.)	Aligned <i>PhD Science</i> Lessons
Employ simple equipment and tools to gather data and extend the senses.	Level K M1 L4–9, 17–20 Level 1 M2 L15–18 Level 2 M1 L14–16, 20–21 Level 2 M3 L3–6, 8–11
Use data and mathematical thinking to construct reasonable explanations.	Level K M1 L8–9, 17–27 Level K M3 L9–12 Level K M4 L1–5, 8–9 Level 1 M1 L1–3 Level 1 M2 L1–3, 15–18 Level 1 M3 L4–6, 18–19, 21–25 Level 1 M4 L9–13 Level 2 M1 L14–16 Level 2 M2 L8–9, 13 Level 2 M3 L3–6, 8–11, 23–24 Level 2 M4 L1–3, 17–22
Communicate with others about investigations and data.	Level K M1 L17–21, 25–26 Level K M2 L17–20 Level K M3 L4–12, 17–18 Level 1 M2 L15–18 Level 1 M4 L9–13 Level 2 M1 L8–9, 14–16 Level 2 M2 L3–4, 10–12 Level 2 M3 L3–7 Level 2 M4 L17–19

Science Is a Way of Knowing	Aligned <i>PhD Science</i> Lessons
The world is discovered through exploration.	Level K M1 L1–2, 10–11, 21, 27–30 Level K M3 L1–3, 9–12, 23–25, 27–29 Level K M4 L1–5 Level 1 M2 L13–14 Level 1 M3 L1–3 Level 1 M4 L1–3, 7–8, 22 Level 2 M2 L1–2, 7 Level 2 M3 L1–6 Level 2 M4 L1–6, 9–13, 16–21
Exploration leads to observation. Observation leads to questions.	Level K M1 L1–3, 22–26 Level K M2 L1–3, 9 Level K M3 L1–3, 14–16, 27–29 Level 1 M2 L13–14 Level 1 M3 L1–3 Level 1 M4 L1–3, 7–8, 22 Level 2 M1 L1–3 Level 2 M2 L1–2 Level 2 M3 L1–2 Level 2 M4 L1–3
Natural events happen today as they happened in the past.	Level K M1 L21 Level 1 M4 L9–13 Level 2 M2 L20–21

Science Is a Way of Knowing (cont.)	Aligned <i>PhD Science</i> Lessons
Events happen in regular patterns and cycles in the natural world.	Level K M3 L4–8, 14–16 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 Level 2 M1 L4–9 Level 2 M2 L1–2, 5–6 Level 2 M4 L1–8, 11–15, 20–21, 23–25
Science Is a Human Endeavor	Aligned <i>PhD Science</i> Lessons
Everyone explores the world, which generates questions.	Level K M1 L1–2, 10–11, 21, 27, 28–30 Level K M3 L1–3, 9–12, 23–25, 27–29 Level K M4 L1–5 Level 1 M2 L13–14 Level 1 M3 L1–3 Level 1 M4 L1–3, 7–8, 22 Level 2 M2 L1–2, 7 Level 2 M3 L1–6 Level 2 M4 L1–6, 9–13, 16–21
The answer is not always as important as the process.	Level 1 M3 L15–16 Level 2 M4 L4–6

Science Is a Human Endeavor (cont.)	Aligned <i>PhD Science</i> Lessons
Questions often lead to other questions.	Level K M1 L1–3, 22–26 Level K M2 L1–3, 9 Level K M3 L1–3, 14–16, 27–29 Level 1 M2 L15–18 Level 2 M1 L1–3 Level 2 M2 L1–2 Level 2 M3 L1–2 Level 2 M4 L1–3
Discoveries are communicated and discussed with others.	Level K M1 L12–16, 28–30 Level K M2 L21–23 Level K M3 L27–29 Level K M4 L20–24, 26–28 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
People address questions through collaboration with peers and continued exploration.	Level K M2 L7–8, 10–15 Level K M3 L4–8 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
Everyone can see themselves as scientists.	Level K M3 L14–16

Scientific Knowledge Is Open to Revision in Light of New Evidence	Aligned <i>PhD Science</i> Lessons
It is essential to learn how to identify credible scientific evidence.	Level K M3 L17–18
Ideas are revised based on new, credible scientific evidence.	Level 1 M3 L15–16 Level 2 M4 L4–6

PhD Science® Correlation to Ohio’s Learning Standards for Science: Level 3

The *PhD Science* K–5 curriculum aligns with Ohio’s Learning Standards for Science—Grade 3. A detailed analysis of alignment appears in the table below.

Key: Module (M), Lesson (L)

Grade 3 Standards

Strand: Earth and Space Science (ESS)

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
3.ESS.1	Earth’s nonliving resources have specific properties.	Level 3 M1 L1–3, 16–29 Level 4 M1 L1–5 Level 5 M2 L12, 26 Level 5 M3 L8, 10–12, 18
	Soil is composed of pieces of rock, organic material, water, and air and has characteristics that can be measured and observed. Use the term “soil,” not “dirt.” Dirt and soils are not synonymous.	Level 2 M2 L3–4
	Rocks have specific characteristics that allow them to be sorted and compared. Rocks form in different ways. Air and water are also nonliving resources.	Level 4 M1 L1–5 Level 5 M2 L12, 26 Level 5 M3 L8, 10–12, 18

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
3.ESS.2	Earth’s resources can be used for energy.	Level 4 M1 L21–27
	Renewable energy resources, such as wind, water, or solar energy, can be replenished within a short amount of time by natural processes.	Level 4 M1 L21–27
	Nonrenewable energy is a finite resource, such as natural gas, coal, or oil, which cannot be replenished in a short amount of time.	Level 4 M1 L21–27

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
3.ESS.3	Some of Earth’s resources are limited.	Level 4 M1 L21–27 Level 5 M3 L17–26
	Some of Earth’s resources become limited due to overuse and/or contamination. Reducing resource use, decreasing waste and/or pollution, recycling, and reusing can help conserve these resources.	Level 4 M1 L21–27 Level 5 M3 L17–26

Strand: Physical Science (PS)

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
3.PS.1	All objects and substances in the natural world are composed of matter.	Level 5 M1 L1–26
	Matter takes up space and has mass.	Level 5 M1 9–17, 23–26

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
3.PS.2	Matter exists in different states, each of which has different properties.	Level 5 M1 L1–7, 9–17, 23–26 Level 5 M2 L6–7, 10–14, 24–26
	The most recognizable states of matter are solids, liquids, and gases.	Level 5 M1 L1–4, 7–10 Level 5 M2 L6–7, 10–14, 24–26
	Shape and compressibility are properties that can distinguish between the states of matter.	Level 5 M1 L5–7, 9–10, 23–26
	One way to change matter from one state to another is by heating or cooling.	Level 5 M1 L9–12, 23–26

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
3.PS.3	Heat, electrical energy, light, sound, and magnetic energy are forms of energy.	Level 4 M2 L1–5, 10–11, 24–26
	There are many different forms of energy. Energy is the ability to cause motion or create change. The different forms of energy that are outlined at this grade level should be limited to familiar forms that a student is able to observe.	Level 4 M2 L1–5, 10–11, 24–26

Strand: Life Science (LS)

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
3.LS.1	Offspring resemble their parents and each other.	Level 3 M3 L14–18, 26–28
	Individual organisms inherit many traits from their parents indicating a reliable way to transfer information from one generation to the next.	Level 3 M3 L14–18, 26–28
	Some behavioral traits are learned through interactions with the environment and are not inherited.	Level 3 M2 L1–2, 9–12, 16–19, 22–28 Level 3 M3 L9–13, 19–20, 26–28

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
3.LS.2	Individuals of the same kind of organism differ in their inherited traits. These differences give some individuals an advantage in surviving and/or reproducing.	Level 3 M2 L1–2, 9–12, 16–19, 22–28 Level 3 M3 L1–6, 9–28
	Plants and animals have physical features that are associated with the environments where they live.	Level 3 M2 L1–2, 9–12, 16–28
	Plants and animals have certain physical or behavioral characteristics that influence their chances of surviving in particular environments.	Level 3 M2 L1–2, 9–28 Level 3 M3 L21–28

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
3.LS.3	Plants and animals have life cycles that are part of their adaptations for survival in their natural environments.	Level 3 M3 L7–8, 23–28
	Worldwide, organisms are growing, reproducing, dying, and decaying. The details of the life cycle are different for different organisms, which affects their ability to survive and reproduce in their natural environments.	Level 3 M3 L7–8, 21–28

PhD Science® Correlation to Ohio’s Learning Standards for Science: Level 4

The *PhD Science* K–5 curriculum aligns with Ohio’s Learning Standards for Science—Grade 4. A detailed analysis of alignment appears in the table below.

Key: Module (M), Lesson (L)

Grade 4 Standards

Strand: Earth and Space Science (ESS)

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
4.ESS.1	Earth’s surface has specific characteristics and landforms that can be identified.	Level 4 M1 L1–5, 8–11, 18–20, 25–27 Level 5 M3 L12–16
	About 70 percent of the Earth’s surface is covered with water and most of that is the ocean. Only a small portion of the Earth’s water is freshwater, which is found in rivers, lakes, groundwater, and glaciers.	Level 5 M3 L4–5, 19–27
	Earth’s surface can change due to erosion and deposition of soil, rock, or sediment.	Level 4 M1 L8–11 Level 5 M3 L12–14
	Catastrophic events such as flooding, volcanoes, and earthquakes can create landforms.	Level 2 M2 L2, 5–7, 13, 18, 21–22 Level 4 M1 L18–20, 25–27 Level 5 M3 L14–16

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
4.ESS.2	The surface of Earth changes due to weathering.	Level 4 M1 L6–18, 25–27
	Rocks change shape, size and/or form due to water or glacial movement, freeze and thaw, wind, plant growth, acid rain, pollution, and catastrophic events such as earthquakes, flooding, and volcanic activity.	Level 4 M1 L6–18, 25–27

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
4.ESS.3	The surface of Earth changes due to erosion and deposition.	Level 4 M1 L6–11, 25–27
	Liquid water, wind, and ice physically remove and carry rock, soil, and sediment (erosion) and deposit the material in a new location (deposition).	Level 4 M1 L6–11, 25–27
	Gravitation force affects movements of water, rock, and soil.	Level 4 M1 L8–11, 25–27

Strand: Physical Science (PS)

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
4.PS.1	When objects break into smaller pieces, dissolve, or change state, the total amount of matter is conserved.	Level 5 M1 L9–17, 23–26
	When an object is broken into smaller pieces, when a solid is dissolved in a liquid, or when matter changes state (solid, liquid, gas), the total amount of matter remains constant.	Level 5 M1 L9–17, 23–26

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
4.PS.2	Energy can be transferred from one location to another or can be transformed from one form to another.	Level 4 M2 L10–11, 15–26
	Energy transfers from hot objects to cold objects as heat, resulting in a temperature change.	Level 4 M2 L10–11
	Electric circuits require a complete loop of conducting materials through which electrical energy can be transferred.	Level 4 M2 L17–23
	Electrical energy in circuits can be transformed to other forms of energy, including light, heat, sound, and motion. Electricity and magnetism are closely related.	Level 3 M4 L19–21, 28–30 Level 4 M2 L10–11, 15–23

Strand: Life Science (LS)

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
4.LS.1	Changes in an organism’s environment are sometimes beneficial to its survival and sometimes harmful.	Level 3 M2 L13–15, 16–28 Level 3 M3 L9–13, 19–20, 26–28
	Ecosystems can change gradually or dramatically. When the environment changes, some plants and animals survive and reproduce and others die or move to new locations.	Level 3 M2 L16–28
	Ecosystems are based on interrelationships among and between biotic and abiotic factors. These include the diversity of other organisms present, the availability of food and other resources, and the physical attributes of the environment.	Level 3 M2 L13–15, 26–28 Level 3 M3 L9–13, 19–20, 26–28

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
4.LS.2	Fossils can be compared to one another and to present-day organisms according to their similarities and differences.	Level 3 M2 L6–8, 26–28 Level 4 M1 L1–5, 19–20, 25–27 Level 4 M3 L1–6, 20, 26–31
	The concept of biodiversity is expanded to include different classification schemes based upon shared internal and external characteristics of organisms.	Level 4 M3 L1–6, 20, 26–31
	Most species that have lived on Earth are extinct.	Level 3 M2 L6–8, 26–28
	Fossils provide a point of comparison between the types of organisms that lived long ago and those existing today.	Level 4 M1 L1–5, 19–20, 25–27

PhD Science® Correlation to Ohio’s Learning Standards for Science: Level 5

The *PhD Science* K–5 curriculum aligns with Ohio’s Learning Standards for Science—Grade 5. A detailed analysis of alignment appears in the table below.

Key: Module (M), Lesson (L)

Grade 5 Standards

Strand: Earth and Space Science (ESS)

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
5.ESS.1	The solar system includes the sun and all celestial bodies that orbit the sun. Each planet in the solar system has unique characteristics.	Level 5 M4 L7–8, 13–17
	The distance from the sun, size, composition, and movement of each planet are unique. Planets revolve around the sun in elliptical orbits. Some of the planets have moons and/or debris that orbit them. Comets, asteroids, and meteoroids orbit the sun.	Level 5 M4 L7–8, 13–17

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
5.ESS.2	The sun is one of many stars that exist in the universe.	Level 5 M4 L5–6, 18–21, 24–26
	The sun appears to be the largest star in the sky because it is the closest star to Earth. Some stars are larger than the sun and some stars are smaller than the sun.	Level 5 M4 L5–6, 18–21, 24–26

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
5.ESS.3	Most of the cycles and patterns of motion between the Earth and sun are predictable.	Level 5 M4 L1–2, 5–17, 20–26
	Earth’s revolution around the sun takes approximately 365 days. Earth completes one rotation on its axis in a 24-hour period, producing day and night. This rotation makes the sun, stars, and moon appear to change position in the sky.	Level 5 M4 L1–2, 5–17, 20–26

Strand: Physical Science (PS)

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
5.PS.1	The amount of change in movement of an object is based on the mass of the object and the amount of force exerted.	Level 3 M4 L10–18, 28–30 Level 4 M2 L6–7, 24–26 Level 5 M4 L3–4, 24–26
	Movement can be measured by speed. The speed of an object is calculated by determining the distance (d) traveled in a period of time (t).	Level 4 M2 L6–7, 24–26
	Any change in speed or direction of an object requires a force and is affected by the mass of the object and the amount of force applied.	Level 3 M4 L10–18, 28–30 Level 5 M4 L3–4, 24–26

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
5.PS.2	Light and sound are forms of energy that behave in predictable ways.	Level 4 M3 L7–14, 29–31 Level 5 M4 L5–6, 9–12, 16–17
	Light travels and maintains its direction until it interacts with an object or moves from one medium to another and then it can be reflected, refracted, or absorbed.	Level 5 M4 L5–6, 9–12, 16–17
	Sound is produced by vibrating objects and requires a medium through which to travel. The rate of vibration is related to the pitch of the sound.	Level 4 M3 L7–14, 29–31

Strand: Life Science (LS)

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
5.LS.1	Organisms perform a variety of roles in an ecosystem.	Level 5 M2 L1–2, 10–26
	Populations of organisms can be categorized by how they acquire energy.	Level 5 M2 L1–2, 10–11, 15–19, 24–26
	Food webs can be used to identify the relationships among producers, consumers, and decomposers in an ecosystem.	Level 5 M2 L1–2, 10–14, 20–26

Code	Standard Content Statement	Aligned <i>PhD Science</i> Lessons
5.LS.2	All of the processes that take place within organisms require energy.	Level 5 M2 L3–9, 14–19, 24–26
	For ecosystems, the major source of energy is sunlight. Energy entering ecosystems as sunlight is transferred and transformed by producers into energy that organisms use through the process of photosynthesis. That energy is used or stored by the producer and can be passed from organism to organism as illustrated in food webs.	Level 5 M2 L3–9, 14–19, 24–26

***PhD Science*® Correlation to Ohio’s Learning Standards for Science: 3–5 Nature of Science**

The *PhD Science* 3–5 curriculum aligns with Ohio’s Learning Standards for Science—3–5 Nature of Science elements. A detailed analysis of alignment appears in the table below.

Key: Module (M), Lesson (L)

Nature of Science Grades 3–5

Scientific Inquiry, Practice, and Applications	Aligned <i>PhD Science</i> Lessons
Observe and ask questions about the world that can be answered through scientific investigations.	Level 3 M2 L4–5 Level 3 M3 L12–13 Level 3 M4 L1–3, 7–21, 29–30 Level 4 M1 L1–2, 8–11, 23 Level 4 M2 L1–3, 6–9, 11, 25–26 Level 4 M3 L1–3, 6, 15–19 Level 4 M4 L1–2, 7–8, 18–21 L7–8, 18–21 Level 5 M1 L1–2, 18–22 Level 5 M2 L1–5 Level 5 M3 L1–3 Level 5 M4 L1–2, 13, 25–26

Scientific Inquiry, Practice, and Applications (cont.)	Aligned <i>PhD Science</i> Lessons
Design and conduct scientific investigations using appropriate safety techniques.	Level 3 M3 L12–13 Level 3 M4 L7–9, 15–16, 23–27, 29–30 Level 4 M1 L8–11 Level 4 M2 L6–7 Level 4 M3 L15–19 Level 4 M4 L7–8, 18–21 Level 5 M1 L13–14, 18–22, 24–26 Level 5 M2 L3–5 Level 5 M3 L10–11 Level 5 M4 L18–19, 25–26
Use appropriate mathematics, tools, and techniques to gather data and information.	Level 3 M1 L11–15, 19–20, 27–29 Level 3 M2 L3–8, 16–19, 27–28 Level 3 M3 L4–8, 12–18, 27–28 Level 3 M4 L7–18, 23–30 Level 4 M1 L6–11, 21–22 Level 4 M2 L8–14 Level 4 M3 L15–19 Level 4 M4 L7–9, 14–17, 26–27 Level 5 M1 L L3–4, 13–17, 24–26 Level 5 M2 L3–5 Level 5 M3 L10–11, 24–27 Level 5 M4 L5–6, 18–19

Scientific Inquiry, Practice, and Applications (cont.)	Aligned <i>PhD Science</i> Lessons
Develop and communicate descriptions, models, explanations, and predictions.	Level 3 M1 L1–3, 13–15, 18–20 Level 3 M2 L6–12, 20–21, 26–28 Level 3 M3 L7–15, 21–28 Level 3 M4 L1–3, 7–21, 28–30 Level 4 M1 L1–5, 10, 18, 21–27 Level 4 M2 L1–5, 8–16, 24–26 Level 4 M3 L1–5, 7–19, 21–31 Level 4 M4 L1–13, 21–22, 25–27 Level 5 M1 L1–2, 5–6, 9–10, 13–14, 23–26 Level 5 M2 L1–2, 6–7, 14 Level 5 M3 L1–3, 9, 12–16, 25–27 Level 5 M4 L1–2, 5–8, 13–17, 20–26
Think critically and ask questions about the observations and explanations of others.	Level 3 M1 L21–27 Level 3 M2 L22–25, 26 Level 3 M3 L14–20, 26 Level 3 M4 L7–9, 28 Level 4 M1 L12–17, 25 Level 4 M3 L21–26, 29 Level 4 M4 L14–17, 22–25 Level 5 M1 L5–6, 23 Level 5 M2 L3–5, 15–17, 21–24 Level 5 M3 L14–16, 24 Level 5 M4 L24
Communicate scientific procedures and explanations.	Level 3 M2 L20–21 Level 4 M1 L23–24 Level 4 M3 L21–23 Level 4 M4 L7–8, 14–17

Scientific Inquiry, Practice, and Applications (cont.)	Aligned <i>PhD Science</i> Lessons
Apply knowledge of science content to real-world challenges.	Level 3 M1 L21–26, 28–29 Level 3 M4 L23–27 Level 4 M1 L12–17 Level 4 M2 L17–23 Level 4 M4 L14–17 Level 5 M2 L21–23
Employ simple equipment and tools to gather data and extend the senses.	Level 3 M1 L4–12 Level 3 M2 L3, 16–19 Level 3 M3 L7–8, 12–13 Level 4 M4 L7–8, 14–17 Level 5 M3 L19–23 Level 5 M4 L25–26
Use data and mathematical thinking to construct reasonable explanations.	Level 3 M1 L4–15, 18–20, 27–29 Level 3 M2 L3–8, 16–19, 26–28 Level 3 M3 L4–11, 14–28 Level 3 M4 L4–14, 19–21, 23–30 Level 4 M1 L12–20, 23–24, 26–27 Level 4 M2 L8–9, 25–26 Level 4 M4 L10–17 Level 5 M1 L5–6, 15–17, 23–26 Level 5 M2 L3–5, 8–13, 15–17, 24–26 Level 5 M3 L4–5, 14–18, 25–27 Level 5 M4 L14–15, 24–26
Communicate with others about investigations and data.	Level 3 M2 L20–21 Level 4 M3 L21–23 Level 5 M2 L3–5, 21–23, 25–26 Level 5 M4 L18–19

Science Is a Way of Knowing	Aligned <i>PhD Science</i> Lessons
Science is both a body of knowledge and processes to discover new knowledge.	Level 3 M3 L16–18 Level 5 M3 L6–8
Science is a way of knowing about the world around us based on evidence from experimentation and observations.	Level 3 M4 L12–14 Level 5 M4 L7–8 Level 5 M2 L14 Level 5 M4 L1–2, 7–8, 13
Science assumes that objects and events occur in consistent patterns that are understandable through measurement and observation.	Level 3 M2 L4–5 Level 3 M3 L7–8 Level 3 M4 L4–6 Level 4 M1 L6–7 Level 4 M3 L7–9 Level 5 M1 L7–8 Level 5 M4 L9–12, 14–17

Science Is a Human Endeavor	Aligned <i>PhD Science</i> Lessons
People from many generations and nations contribute to science knowledge.	Level 3 M3 L16–18
People of all cultures, genders, and backgrounds can pursue a career in science.	Level 3 M3 L16–18
Scientists often work in teams.	Level 3 M3 L12–13 Level 4 M2 L17–23
Science affects everyday life.	Level 3 M1 L21–26 Level 4 M2 L1–3
Science requires creativity and imagination.	Level 5 M3 L19–23

Scientific Knowledge Is Open to Revision in Light of New Evidence	Aligned <i>PhD Science</i> Lessons
Science develops theories based on a body of scientific evidence.	Level 3 M4 L12–14
Science explanations can change based on new scientific evidence.	Level 5 M4 L14–15