



Ohio Learning Standards Correlation to *PhD Science*[™]

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Key: Module (M), Lesson (L)


PhD Science Level 3


The Grade 3 Ohio Learning Standards are fully covered by the *PhD Science* curriculum, but some out of grade level. A detailed analysis of alignment is provided in the table below.


Grade 3 Standards		Aligned <i>PhD Science</i> Lessons
Physical Science		
Matter and Forms of Energy This topic focuses on the relationship between matter and energy. Matter has specific properties and is found in all substances on Earth. Heat is a familiar form of energy that can change the states of matter.		
3.PS.1	All objects and substances in the natural world are composed of matter.	
	Matter takes up space and has mass.	 Level 5 M1 L5–L8 (particle model) Level 5 M1 L23–L26
3.PS.2	Matter exists in different states, each of which has different properties.	
	The most recognizable states of matter are solids, liquids, and gases.	 Level 5 M1 L1–L4 Level 5 M2 L6–L7 Level 5 M2 L10–L14 Level 5 M2 L24–L26 Level 5 M3 L24–L27
	Shape and compressibility are properties that can distinguish between the states of matter.	 Level 5 M1 L1–L4 Level 5 M1 L23–26
	One way to change matter from one state to another is by heating or cooling.	 Level 5 M1 L9–L12 Level 5 M1 L23–L26
3.PS.3	Heat, electrical energy, light, sound, and magnetic energy are forms of energy.	
	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–L5 Level 4 M2 L10–L11 Level 4 M2 L24–L26
Life Science		
Behavior, Growth, and Changes This topic explores life cycles of organisms and the relationship between the natural environment and an organism’s (physical and behavioral) traits, which affect its ability to survive and reproduce.		
3.LS.1	Offspring resemble their parents and each other.	

	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–L18 Level 3 M3 L26–L28
	Some behavioral traits are learned through interactions with the environment and are not inherited.		Level 3 M2 L1–L2 Level 3 M2 L9–L12 Level 3 M2 L16–L19 Level 3 M2 L22–L28 Level 3 M3 L21–L28
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.		
	Plants and animals have physical features that are associated with the environments where they live.		Level 3 M2 L1–L2 Level 3 M2 L9–L12 Level 3 M2 L16–L28
	Plants and animals have certain physical or behavioral characteristics that influence their chances of surviving in particular environments.		Level 3 M2 L1–L2 Level 3 M2 L9–L28
3.LS.3	Plants and animals have life cycles that are part of their adaptations for survival in their natural environments.		
	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–L8 Level 3 M3 L21–L28
Earth and Space Science			
Earth's Resources			
This topic focuses on Earth's resources. While resources can be living and nonliving, within this strand, the emphasis is on Earth's nonliving resources, such as water, air, rock, soil and the energy resources they represent.			
3.ESS.1	Earth's nonliving resources have specific properties.		
	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 3 M1 L1–L3 Level 3 M1 L16–L29 Level 5 M3 L1–L13 Level 5 M3 L18 Level 5 M3 L27
	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–L5 Level 5 M2 L12 Level 5 M2 L26 Level 5 M3 L8 Level 5 M3 L10–L12 Level 5 M3 L18
3.ESS.2	Earth's resources can be used for energy.		
	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–L27
	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–L27
3.ESS.3	Some of Earth's resources are limited.		
	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 5 M3 L17–L26

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PhD Science Level 4

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Grade 4 Standards		Aligned <i>PhD Science</i> Lessons
Physical Science		
Electricity, Heat, and Matter This topic focuses on the conservation of matter and the processes of energy transfer and transformation, especially as they apply to heat and electrical energy.		
4.PS.1	When objects break into smaller pieces, dissolve, or change state, the total amount of matter is conserved.	
	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 4 M2 L8–L9 Level 4 M2 L24–L26 Level 5 M1 L11–L17 Level 5 M1 L23–L26
4.PS.2	Energy can be transferred from one location to another or can be transformed from one form to another.	
	Energy transfers from hot objects to cold objects as heat, resulting in a temperature change.	 Level 4 M2 L10–L11
	Electric circuits require a complete loop of conducting materials through which electrical energy can be transferred.	 Level 4 M2 L17–L23
	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 4 M2 L10–L11 Level 4 M2 L15–L23
Life Science		
Earth's Living History This topic focuses on using fossil evidence and living organisms to observe that suitable habitats depend upon a combination of biotic and abiotic factors.		
4.LS.1	Changes in an organism's environment are sometimes beneficial to its survival and sometimes harmful.	
	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–L28

	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–L15 Level 3 M2 L26–L28 Level 3 M3 L9–L13 Level 3 M3 L19–L20 Level 3 M3 L26–L28
4.LS.2	Fossils can be compared to one another and to present-day organisms according to their similarities and differences.		
	The concept of biodiversity is expanded to include different classification schemes based upon shared internal and external characteristics of organisms.		Level 4 M3 L1–L6 Level 4 M3 L20 Level 4 M3 L26–L31
	Most species that have lived on Earth are extinct.		Level 3 M2 L6–L8 Level 3 M2 L26–L28
	Fossils provide a point of comparison between the types of organisms that lived long ago and those existing today.		Level 3 M2 L1–L8 Level 3 M2 L26–L28 Level 4 M1 L1–L5 Level 4 M1 L19–L20 Level 4 M1 L25–L27
Earth and Space Science			
Earth's Surface			
This topic focuses on the variety of processes that shape and reshape Earth's surface.			
4.ESS.1	Earth's surface has specific characteristics and landforms that can be identified.		
	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 4 M1 L1–L5 Level 4 M1 L19–L20 Level 4 M1 L25–L27 Level 5 M3 L4–L5
	Earth's surface can change due to erosion and deposition of soil, rock, or sediment.		Level 4 M1 L8–L11 Level 5 M3 L12–L14
	Catastrophic events such as flooding, volcanoes, and earthquakes can create landforms.		Level 5 M3 L14–L16
4.ESS.2	The surface of Earth changes due to weathering.		
	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–L18 Level 4 M1 L25–L27
4.ESS.3	The surface of Earth changes due to erosion and deposition.		
	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 L8–L11 Level 4 M1 L25–L27 Level 5 M3 L10–L11 Level 5 M3 L12–L13
	Gravitation force affects movements of water, rock, and soil.		Level 4 M1 L8–L11 Level 4 M1 L25–L27

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PhD Science Level 5

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Grade 5 Standards		Aligned <i>PhD Science</i> Lessons
Physical Science		
Light, Sound, and Motion		
This topic focuses on the forces that affect motion. This includes the relationship between the change in speed of an object, the amount of force applied, and the mass of the object. Light and sound are explored as forms of energy that move in predictable ways, depending on the matter through which they move.		
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.	
	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).	Blue
	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.	Yellow
		Level 4 M2 L6–L7 Level 4 M2 L24–L26
		Level 3 M4 L10–L18 Level 3 M4 L28–L30 Level 5 M4 L3–L4 Level 5 M4 L24–L26
5.PS.2	Light and sound are forms of energy that behave in predictable ways.	
	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.	Green
	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.	Blue
		Level 5 M4 L5–L6 Level 5 M4 L9–L12 Level 5 M4 L16–L17
		Level 4 M3 L7–L14 Level 4 M3 L29–L31
Life Science		
Interconnections within Ecosystems		
This topic focuses on foundational knowledge of the structures and functions of ecosystems.		
5.LS.1	Organisms perform a variety of roles in an ecosystem.	
	Populations of organisms can be categorized by how they acquire energy.	Green
		Level 5 M2 L1–L2 Level 5 M2 L10–L11

			Level 5 M2 L15–L19 Level 5 M2 L24–L26
	Food webs can be used to identify the relationships among producers, consumers, and decomposers in an ecosystem.		Level 5 M2 L1–L2 Level 5 M2 L10–L14 Level 5 M2 L20–L26
5.LS.2	All of the processes that take place within organisms require energy.		
	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–L9 Level 5 M2 L14–L19 Level 5 M2 L24–L26
Earth and Space Science			
Cycles and Patterns in the Solar System			
This topic focuses on the characteristics, cycles, and patterns in the solar system and within the universe.			
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.		
	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–L8 Level 5 M4 L13 Level 5 M4 L14–L17
5.ESS.2	The sun is one of many stars that exist in the universe.		
	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–L6 Level 5 M4 L18–L21 Level 5 M4 L24–L26
5.ESS.3	Most of the cycles and patterns of motion between the Earth and sun are predictable.		
	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–L2 Level 5 M4 L5–L17 Level 5 M4 L20–L26