


## Next Generation Content Standards and Objectives for Science in West Virginia Schools Correlation to *PhD Science*™

 Green indicates that *PhD Science*™ fully addresses the standard within the grade level.

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

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

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**Key:** Module (M), Lesson (L)





### *PhD Science* Level 3

The Grade 3 Next Generation Content Standards and Objectives for Science in West Virginia Schools are fully covered by the Level 3 *PhD Science* curriculum. A detailed analysis of alignment appears in the table below.

Grade 3 Standards and Objectives		Aligned <i>PhD Science</i> Lessons
<b>Physical Science—Motion and Stability, Forces and Interactions</b>		
<b>Forces and Interactions</b>		
S.3.GS.1	Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.	Level 3 M4 L10–L18 Level 3 M4 L28–L30
S.3.GS.2	Make observations and/or measurements of an object’s motion to provide evidence that a pattern can be used to predict future motion.	Level 3 M4 L1–L9 Level 3 M4 L28–L30
S.3.GS.3	Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.	Level 3 M4 L19–L21 Level 3 M4 L28–L30
S.3.GS.4	Define a simple design problem that can be solved by applying scientific ideas about magnets.	Level 3 M4 L22–L30
<b>Life Science—Ecosystems: Interactions, Energy, and Dynamics and Biological Evolution: Unity and Diversity</b>		
<b>Interdependent Relationships in Ecosystems</b>		
S.3.GS.5	Construct an argument that some animals form groups that help members survive.	Level 3 M2 L13–L15 Level 3 M2 L26–L28
S.3.GS.6	Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.	Level 3 M2 L1–L8 Level 3 M2 L26–L28
S.3.GS.7	Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.	Level 3 M3 L21–L28
S.3.GS.8	Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.	Level 3 M2 L1–L2 Level 3 M2 L9–L12 Level 3 M2 L16–L19

		Level 3 M2 L22–L28
<b>Life Science—From Molecules to Organisms: Structures and Processes and Heredity: Inheritance and Variation of Traits across Generations</b>		
<b>Inheritance and Variation of Traits: Life Cycles and Traits</b>		
S.3.GS.9	Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.	Level 3 M3 L7–L8 Level 3 M3 L23–L28
S.3.GS.10	Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.	Level 3 M3 L1–L6 Level 3 M3 L14–L18 Level 3 M3 L26–L28
S.3.GS.11	Use evidence to support the explanation that traits can be influenced by the environment.	Level 3 M3 L9–L13 Level 3 M3 L19–L20 Level 3 M3 L26–L28
S.3.GS.12	Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.	Level 3 M3 L21–L28
<b>Earth and Space Science—Earth’s Systems and Earth and Human Activity</b>		
<b>Weather and Climate</b>		
S.3.GS.13	Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.	Level 3 M1 L1–L15 Level 3 M1 L19–L20 Level 3 M1 L27–L29
S.3.GS.14	Obtain and combine information to describe climates in different regions of the world.	Level 3 M1 L11–L15 Level 3 M1 L27–L29
S.3.GS.15	Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.	Level 3 M1 L1–L3 Level 3 M1 L16–L29
<b>Engineering, Technology, and Applications of Science</b>		
<b>Engineering Design</b>		
S.3–5.ETS.1	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.	Level 3 M1 L21–L26
S.3–5.ETS.2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.	Level 3 M2 L22–L25
S.3–5.ETS.3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	Level 3 M4 L23–L27

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### *PhD Science* Level 4

The Grade 4 Next Generation Content Standards and Objectives for Science in West Virginia Schools are fully covered by the Level 4 *PhD Science* curriculum. A detailed analysis of alignment appears in the table below.

Grade 4 Standards and Objectives		Aligned <i>PhD Science</i> Lessons
<b>Physical Science—Energy</b>		
<b>Energy</b>		
S.4.GS.1	Use evidence to construct an explanation relating the speed of an object to the energy of that object.	Level 4 M2 L6–L7 Level 4 M2 L24–L26
S.4.GS.2	Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.	Level 4 M2 L1–L5 Level 4 M2 L10–L11 Level 4 M2 L24–L26
S.4.GS.3	Ask questions and predict outcomes about the changes in energy that occur when objects collide.	Level 4 M2 L8–L9 Level 4 M2 L24–L26
S.4.GS.4	Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.	Level 4 M2 L12–L26
S.4.GS.5	Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.	Level 4 M1 L21–L27
<b>Physical Science—Waves and Their Applications in Technologies for Information Transfer</b>		
<b>Waves: Waves and Information</b>		
S.4.GS.6	Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.	Level 4 M3 L7–L14 Level 4 M3 L29–L31
S.4.GS.7	Generate and compare multiple solutions that use patterns to transfer information.	Level 4 M4 L18–L27
<b>Life Science—From Molecules to Organisms: Structures and Processes</b>		
<b>Structure, Function, and Information Processing</b>		
S.4.GS.8	Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.	Level 4 M4 L1–L17 Level 4 M4 L25–L27

S.4.GS.9	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	Level 4 M3 L1–L6 Level 4 M3 L20 Level 4 M3 L26–L31
S.4.GS.10	Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.	Level 4 M3 L1–L6 Level 4 M3 L15–L25 Level 4 M3 L29–L31
<b>Earth's Place in the Universe and Earth's Systems</b>		
<b>Earth's Systems: Processes that Shape the Earth</b>		
S.4.GS.11	Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.	Level 4 M1 L1–L5 Level 4 M1 L19–L20 Level 4 M1 L25–L27
S.4.GS.12	Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.	Level 4 M1 L6–L11 Level 4 M1 L25–L27
S.4.GS.13	Analyze and interpret data from maps to describe patterns of Earth's features.	Level 4 M1 L18–L20 Level 4 M1 L25–L27
S.4.GS.14	Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.	Level 4 M1 L12–L17 Level 4 M1 L25–L27
<b>Engineering, Technology, and Applications of Science</b>		
<b>Engineering Design</b>		
S.3–5.ETS.1	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.	Level 4 M2 L17–L23
S.3–5.ETS.2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.	Level 4 M1 L12–L17 Level 4 M4 L14–L17
S.3–5.ETS.3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	Level 4 M4 L14–L17

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### *PhD Science* Level 5

The Grade 5 Next Generation Content Standards and Objectives for Science in West Virginia Schools are fully covered by the Level 5 *PhD Science* curriculum. A detailed analysis of alignment appears in the table below.

Grade 5 Standards and Objectives		Aligned <i>PhD Science</i> Lessons
<b>Physical Science—Matter and Its Interactions</b>		
<b>Structure and Properties of Matter</b>		
S.5.GS.1	Develop a model to describe that matter is made of particles too small to be seen.	Level 5 M1 L5–L10 Level 5 M1 L23–L26
S.5.GS.2	Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.	Level 5 M1 L9–L17 Level 5 M1 L23–L26
S.5.GS.3	Make observations and measurements to identify materials based on their properties.	Level 5 M1 L1–L4 Level 5 M1 L11–L17 Level 5 M1 L23–L26
S.5.GS.4	Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	Level 5 M1 L1–L2 Level 5 M1 L13–L26
<b>Physical Science—Energy</b>		
<b>Matter and Energy in Organisms and Ecosystems</b>		
S.5.GS.5	Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.	Level 5 M2 L15–L19 Level 5 M2 L24–L26
S.5.GS.6	Support an argument that plants get the materials they need for growth chiefly from air and water.	Level 5 M2 L3–L5 Level 5 M2 L24–L26
S.5.GS.7	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	Level 5 M2 L1–L2 Level 5 M2 L6–L14 Level 5 M2 L20 Level 5 M2 L24–L26
<b>Earth and Space Science—Earth and Human Activity</b>		
<b>Earth's Systems</b>		
S.5.GS.8	Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.	Level 5 M3 L1–L3 Level 5 M3 L6–L13

			Level 5 M3 L19–L27
S.5.GS.9	Describe and graph the amounts and percentages of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.		Level 5 M3 L4–L5 Level 5 M3 L19–L27
S.5.GS.10	Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.		Level 5 M3 L14–L18 Level 5 M3 L24–L27
<b>Earth and Space Science—Earth’s Place in the Universe</b>			
<b>Space Systems: Stars and the Solar System</b>			
S.5.GS.11	Support an argument that the gravitational force exerted by Earth on objects is directed down.		Level 5 M4 L3–L4 Level 5 M4 L24–L26
S.5.GS.12	Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.		Level 5 M4 L18–L19 Level 5 M4 L24–L26
S.5.GS.13	Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.		Level 5 M4 L1–L2 Level 5 M4 L5–L17 Level 5 M4 L20–L26
<b>Engineering, Technology, and Applications of Science</b>			
<b>Engineering Design</b>			
S.3–5.ETS.1	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.		Level 5 M2 L21–L23
S.3–5.ETS.2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.		Level 5 M3 L19–L23
S.3–5.ETS.3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.		Level 5 M1 L18–L22