PhD Science® K–5 Content Correlation to K–5 Georgia Standards of Excellence (GSE) for Science

Contents

K–2 Grade Band

3–5 Grade Band

PhD Science® Content Correlation to Georgia Standards of Excellence (GSE) for Science: Level K

The *PhD Science* Level K curriculum mostly aligns with the Kindergarten GSE for Science. A detailed analysis of alignment follows.

Key: Module (M), Lesson (L)

Kindergarten Standards

Earth and Space Science	**Aligned *PhD Science* Lessons**
SKE1. Obtain, evaluate, and communicate observations about time patterns (day to night and night to day) and objects (sun, moon, stars) in the day and night sky.	**Level K M1** L8 Part 1 **Level 1 M4** L1 Parts 1, 2; L2 Parts 1, 2, 3; L3 Parts 1, 2; L5 Parts 1, 2, 3; L6 Part 1; L7 Parts 1, 2, 3; L8 Part 1; L9 Parts 1, 2, 3
a. Ask questions to classify objects according to those seen in the day sky, the night sky, and both.	**Level 1 M4** L1 Parts 1, 2; L2 Parts 1, 2, 3; L3 Parts 1, 2; L5 Parts 1, 2, 3; L6 Part 1; L7 Parts 1, 2, 3; L8 Part 1; L9 Parts 1, 2, 3
b. Develop a model to communicate the changes that occur in the sky during the day, as day turns into night, during the night, and as night turns into day using pictures and words.	**Level 1 M4** L1 Part 2; L2 Part 2; L3 Part 2; L4 Part 5; L5 Part 1; L6 Part 1; L8 Part 1
SKE2. Obtain, evaluate, and communicate information to describe the physical attributes of earth materials (soil, rocks, water, and air).	**Level K M1** L1 Part 2 **Level 2 M2** L1 Parts 1, 2; L2 Parts 1, 2, 3; L3 Parts 2, 3, 4
a. Ask questions to identify and describe earth materials—soil, rocks, water, and air.	**Level K M1** L1 Part 2 **Level 2 M2** L2 Parts 2, 3; L5 Part 1
b. Construct an argument supported by evidence for how rocks can be grouped by physical attributes (size, weight, texture, color).	**Level 2 M2** L2 Parts 2, 3; L5 Part 1
c. Use tools to observe and record physical attributes of soil such as texture and color.	**Level 2 M2** L2 Parts 2, 3; L3 Parts 3, 4

Physical Science	**Aligned *PhD Science* Lessons**
SKP1. Obtain, evaluate, and communicate information to describe objects in terms of the materials they are made of and their physical attributes.	**Level K M1** L7 Parts 2, 3, 4 **Level K M2** L8 Parts 1, 2, 3, 4 **Level 1 M3** L1 Parts 1, 2, 3; L3 Part 1; L4 Parts 1, 2; L12 Parts 1, 2, 3, 4, 5 **Level 2 M1** L1 Parts 1, 2, 3; L2 Parts 1, 2, 3, 4; L3 Parts 1, 2; L4 Part 2; L5 Part 1; L6 Part 1; L8 Part 1; L12 Parts 1, 2, 3 **Level 2 M2** L2 Parts 2, 3; L5 Part 1
a. Ask questions to compare and sort objects made of different materials.	**Level K M1** L7 Parts 2, 3, 4 **Level K M2** L8 Parts 1, 2, 3, 4 **Level 2 M1** L9 Parts 1, 2, 3; L10 Part 1; L11 Parts 1, 2, 4; L12 Parts 1, 2, 3
b. Use senses and science tools to classify common objects, such as buttons or swatches of cloth, according to their physical attributes (color, size, shape, weight, and texture).	**Level 1 M3** L1 Parts 1, 2, 3; L3 Part 1; L4 Parts 1, 2; L12 Parts 1, 2, 3, 4, 5 **Level 2 M1** L1 Parts 1, 2, 3; L2 Parts 1, 2, 3, 4; L3 Parts 1, 2; L4 Part 2; L5 Part 1; L6 Part 1; L8 Part 1; L12 Parts 1, 2, 3 **Level 2 M2** L2 Parts 2, 3; L5 Part 1
c. Plan and carry out an investigation to predict and observe whether objects, based on their physical attributes, will sink or float.	**Level 2 M3** L9 Part 2
SKP2. Obtain, evaluate, and communicate information to compare and describe different types of motion.	**Level K M2** L1 Parts 1, 2, 3; L2 Parts 1, 2, 3; L4 Part 1; L5 Parts 1, 2; L6 Parts 1, 2; L7 Part 1; L9 Parts 1, 2, 3
a. Plan and carry out an investigation to determine the relationship between an object's physical attributes and its resulting motion (straight, circular, back and forth, fast and slow, and motionless) when a force is applied.	**Level K M2** L3 Part 1; L5 Part 3; L7 Part 1; L8 Part 2
b. Construct an argument as to the best way to move an object based on its physical attributes.	**Level K M2** L2 Parts 1, 2, 3; L4 Part 1; L5 Parts 1, 2, 3; L6 Parts 1, 2; L7 Part 1; L9 Parts 1, 2, 3, 4

Life Science	**Aligned *PhD Science* Lessons**
SKL1. Obtain, evaluate, and communicate information about how organisms (alive and not alive) and nonliving objects are grouped.	**Level K M3** L1 Parts 1, 2, 3; L3 Parts 2, 3, 4; L4 Part 1; L5 Parts 1, 2, 3; L6 Parts 1, 2; L7 Part 2; L8 Part 1; L9 Parts 1, 2, 3, 4; L10 Part 1; L11 Parts 1, 2, 3 **Level K M4** L1 Parts 1, 2; L2 Parts 1, 2; L3 Part 1; L4 Part 1; L11 Part 1 **Level 1 M1** L1 Part 1; L2 Part 1; L5 Part 1; L15 Part 1
a. Construct an explanation based on observations to recognize the differences between organisms and nonliving objects.	**Level K M3** L1 Parts 1, 2, 3; L3 Parts 2, 3, 4; L4 Part 1; L5 Parts 1, 2, 3; L6 Parts 1, 2; L7 Part 2; L8 Part 1; L9 Parts 1, 2, 3, 4; L10 Part 1; L11 Parts 1, 2, 3 **Level K M4** L1 Parts 1, 2; L2 Parts 1, 2; L3 Part 1; L4 Part 1; L11 Part 1 **Level 1 M1** L1 Part 1; L2 Part 1; L5 Part 1; L15 Part 1
b. Develop a model to represent how a set of organisms and nonliving objects are sorted into groups based on their attributes.	**Level K M3** L1 Parts 2, 3; L2 Part 5; L3 Part 4; L7 Part 2; L9 Part 3 **Level K M4** L1 Part 2; L2 Parts 1, 2, 3; L3 Parts 1, 2; L4 Parts 1, 2; L6 Parts 1, 2, 3; L7 Parts 2, 3
SKL2. Obtain, evaluate, and communicate information to compare the similarities and differences in groups of organisms.	**Level 1 M1** L12 Parts 1, 2; L14 Part 1; L15 Parts 1, 2, 3 **Level 2 M3** L9 Parts 1, 2
a. Construct an argument supported by evidence for how animals can be grouped according to their features.	**Level 1 M1** L2 Part 1; L3 Parts 1, 2, 3; L5 Part 1; L7 Parts 1, 2; L8 Parts 1, 2; L9 Part 1; L12 Parts 1, 2; L13 Parts 1, 2; L15 Parts 1, 2, 3
b. Construct an argument supported by evidence for how plants can be grouped according to their features.	**Level 1 M1** L1 Parts 1, 2; L2 Part 1; L4 Parts 1, 2; L6 Part 1; L7 Parts 1, 2; L11 Part 1; L12 Part 2; L15 Parts 1, 2, 3 **Level 2 M3** L9 Parts 1, 2
c. Ask questions and make observations to identify the similarities and differences of offspring to their parents and to other members of the same species.	**Level 1 M1** L12 Parts 1, 2; L14 Part 1; L15 Parts 1, 2, 3

Science and Engineering Practices	Aligned *PhD Science* Lessons
Asking Questions and Defining Problems	**Level K M1** L1 Part 2; L2 Part 1; L3 Part 3; L4 Part 2; L7 Parts 1, 3, 5; L10 Part 1 **Level K M2** L1 Part 3; L4 Part 1 **Level K M3** L1 Part 3; L3 Part 1; L9 Part 4 **Level K M4** L1 Part 2
Developing and Using Models	**Level K M1** L1 Part 2; L4 Part 1 **Level K M2** L1 Part 2; L2 Part 3; L5 Parts 2, 3; L8 Parts 2, 4; L9 Parts 1, 2, 3 **Level K M3** L1 Part 2; L3 Part 4; L4 Part 1 **Level K M4** L1 Part 2; L2 Part 1; L3 Part 1; L5 Parts 1, 2; L6 Part 1; L7 Part 2
Planning and Carrying Out Investigations	**Level K M1** L3 Parts 1, 2; L4 Part 1; L5 Part 1; L6 Part 1; L8 Parts 1, 4; L9 Parts 1, 2; L10 Part 2; L12 Part 1; L13 Parts 1, 2, 3 **Level K M2** L3 Part 1; L5 Part 1; L6 Parts 1, 2; L7 Part 1; L8 Parts 1, 3, 4; L9 Parts 1, 2, 3 **Level K M3** L2 Parts 1, 2, 3; L4 Part 1 **Level K M4** L2 Part 2
Constructing Explanations and Designing Solutions	**Level K M2** L3 Part 2; L8 Parts 2, 3 **Level K M3** L2 Part 4; L4 Part 1; L5 Part 3
Obtaining, Evaluating, and Communicating Information	**Level K M1** L11 Part 2 **Level K M3** L9 Part 2 **Level K M4** L1 Part 1; L4 Parts 1, 2; L5 Parts 1, 2; L6 Part 2; L7 Part 3; L8 Part 1; L9 Parts 1, 2; L10 Part 5; L12 Parts 1, 2, 3

Crosscutting Concepts	Aligned *PhD Science* Lessons
Patterns	**Level K M1** L8 Parts 1, 3; L9 Parts 1, 2; L11 Part 1; L12 Part 1; L13 Parts 1, 2, 3 **Level K M2** L1 Part 1; L2 Part 1; L8 Parts 1, 4 **Level K M3** L2 Parts 4, 5; L3 Part 1; L5 Parts 2, 3; L6 Parts 1, 2; L7 Part 1; L9 Part 1; L10 Part 1; L11 Parts 1, 2, 3 **Level K M4** L2 Part 2
Cause and Effect	**Level K M2** L2 Parts 1, 2; L3 Part 1; L4 Part 1; L5 Parts 2, 3; L6 Parts 2, 3; L7 Part 1; L8 Parts 2, 3; L9 Parts 1, 2, 3 **Level K M4** L4 Part 2; L5 Parts 1, 2; L7 Part 2; L9 Part 1; L12 Parts 1, 2, 3
Scale, Proportion, and Quantity	**Level K M1** L1 Parts 1, 2; L2 Part 1; L3 Parts 1, 2, 3, 4; L4 Part 2; L6 Part 1; L7 Parts 1, 5; L8 Part 2; L10 Part 2; L13 Parts 1, 2, 3 **Level K M2** L3 Parts 1, 2; L9 Parts 1, 2, 3 **Level K M3** L1 Part 1; L3 Part 4 **Level K M4** L11 Part 1
Systems and System Models	**Level K M3** L1 Part 2; L3 Parts 2, 3; L4 Part 1; L5 Part 1; L7 Part 2; L8 Part 1; L9 Parts 2, 3, 4; L11 Parts 1, 2, 3 **Level K M4** L1 Parts 1, 2; L2 Parts 1, 3; L3 Parts 1, 2; L4 Part 1; L5 Parts 1, 2; L6 Parts 1, 2, 3; L7 Part 3
Energy and Matter	**Level K M4** L9 Part 2; L10 Parts 1, 5
Structure and Function	**Level K M1** L5 Part 1; L7 Parts 2, 3, 4 **Level K M4** L10 Parts 1, 2, 3, 4, 5
Stability and Change	**Level K M1** L4 Part 1; L8 Part 2 **Level K M3** L2 Parts 1, 2, 3; L4 Part 1; L11 Parts 1, 2, 3 **Level K M4** L6 Part 2; L7 Parts 1, 3; L8 Part 1

PhD Science® Content Correlation to Georgia Standards of Excellence (GSE) for Science: Level 1

The *PhD Science* Level 1 curriculum aligns with the Grade 1 GSE for Science. A detailed analysis of alignment follows.

Key: Module (M), Lesson (L)

Grade 1 Standards

Earth and Space Science	**Aligned *PhD Science* Lessons**
S1E1. Obtain, evaluate, and communicate weather data to identify weather patterns.	**Level K M1** L1 Parts 1, 2; L2 Part 1; L3 Parts 1, 2, 3, 4; L4 Part 1; L5 Part 1; L6 Part 1; L8 Parts 1, 2, 3, 4; L9 Parts 1, 2; L13 Parts 1, 2, 3 **Level K M4** L11 Part 1 **Level 2 M4** L2 Part 3; L5 Part 1; L11 Part 1; L12 Parts 1, 2, 3
a. Represent data in tables and/or graphs to identify and describe different types of weather and the characteristics of each type.	**Level K M1** L3 Parts 1, 2, 3, 4; L6 Part 1; L8 Parts 1, 2, 3, 4; L9 Part 1; L10 Parts 1, 2, 3; L11 Parts 1, 2; L12 Part 1; L13 Parts 1, 2, 3
b. Ask questions to identify forms of precipitation such as rain, snow, sleet, and hailstones as either solid (ice) or liquid (water).	**Level K M1** L1 Parts 1, 2; L2 Part 1; L3 Parts 1, 2, 3, 4; L4 Part 1; L5 Part 1; L6 Part 1; L8 Parts 1, 2, 3, 4; L9 Parts 1, 2; L13 Parts 1, 2, 3 **Level K M4** L11 Part 1 **Level 2 M4** L2 Part 3; L5 Part 1; L11 Part 1; L12 Parts 1, 2, 3
c. Plan and carry out investigations on current weather conditions by observing, measuring with simple weather instruments (thermometer, wind vane, rain gauge), and recording weather data (temperature, precipitation, sky conditions, and weather events) in a periodic journal, on a calendar, and graphically.	**Level K M1** L1 Parts 1, 2; L2 Part 1; L3 Parts 1, 2, 3, 4; L4 Part 1; L5 Part 1; L6 Part 1; L8 Parts 1, 2, 3, 4; L9 Parts 1, 2; L13 Parts 1, 2, 3 **Level K M4** L11 Part 1
d. Analyze data to identify seasonal patterns of change.	**Level K M1** L1 Parts 1, 2; L2 Part 1; L3 Parts 1, 2, 3, 4; L4 Part 1; L5 Part 1; L6 Part 1; L8 Parts 1, 2, 3, 4; L9 Parts 1, 2; L13 Parts 1, 2, 3 **Level K M4** L11 Part 1

Physical Science	**Aligned *PhD Science* Lessons**
S1P1. Obtain, evaluate, and communicate information to investigate light and sound.	**Level 1 M2** L1 Parts 1, 2; L2 Part 1; L3 Parts 1, 2, 3, 4; L4 Part 1; L5 Part 1; L6 Parts 1, 2, 3; L7 Parts 1, 2, 3, 4; L8 Parts 1, 2; L9 Part 1; L10 Parts 1, 2, 3 **Level 1 M3** L1 Parts 1, 2, 3; L2 Parts 1, 2, 3; L3 Part 1; L4 Parts 1, 2; L5 Part 1; L6 Parts 1, 2, 3; L7 Part 1; L8 Parts 1, 2; L9 Part 1; L12 Part 4
a. Use observations to construct an explanation of how light is required to make objects visible.	**Level 1 M2** L2 Part 1; L3 Parts 1, 2, 3, 4; L4 Part 1; L5 Part 1; L9 Part 1; L10 Parts 1, 2, 3
b. Ask questions to identify and compare sources of light.	**Level 1 M2** L2 Part 1; L3 Parts 1, 4; L4 Part 1; L5 Part 1; L6 Parts 1, 2, 3
c. Plan and carry out an investigation of shadows by placing objects at various points from a source of light.	**Level 1 M2** L1 Parts 1, 2; L6 Parts 1, 2, 3; L7 Parts 1, 2, 3, 4; L8 Parts 1, 2; L9 Part 1; L10 Parts 1, 2, 3
d. Construct an explanation supported by evidence that vibrating materials can make sound and that sound can make materials vibrate.	**Level 1 M3** L1 Parts 1, 2, 3; L2 Parts 1, 2, 3; L3 Part 1; L4 Parts 1, 2; L5 Part 1; L6 Parts 1, 2, 3; L7 Part 1; L8 Parts 1, 2; L9 Part 1; L12 Part 4
e. Design a signal that can serve as an emergency alert using light and/or sound to communicate over a distance.	**Level 1 M3** L10 Parts 1, 2; L11 Part 1; L12 Parts 1, 2, 3, 4, 5; L13 Parts 1, 2, 3, 4
S1P2. Obtain, evaluate, and communicate information to demonstrate the effects of magnets on other magnets and other objects.	**Level 3 M4** L10 Parts 1, 2, 3; L11 Part 1; L12 Part 1; L13 Parts 1, 2; L14 Part 1
a. Construct an explanation of how magnets are used in everyday life.	**Level 3 M4** L10 Part 3; L11 Part 1
b. Plan and carry out an investigation to demonstrate how magnets attract and repel each other and the effect of magnets on common objects.	**Level 3 M4** L10 Parts 1, 2, 3; L11 Part 1; L12 Part 1; L13 Parts 1, 2, 3, 4, 5

Life Science	**Aligned *PhD Science* Lessons**
S1L1. Obtain, evaluate, and communicate information about the basic needs of plants and animals.	**Level K M3** L2 Parts 1, 2, 3, 4, 5; L3 Part 1; L4 Part 1; L5 Parts 2, 3; L7 Part 1; L11 Parts 1, 2, 3 **Level K M4** L1 Parts 1, 2; L2 Parts 1, 2; L3 Part 1; L4 Part 1; L11 Part 1 **Level 1 M1** L1 Parts 1, 2; L2 Part 1; L4 Parts 1, 2; L6 Part 1; L7 Parts 1, 2, 3, 4, 5; L11 Part 1; L15 Parts 1, 2, 3
a. Develop models to identify the parts of a plant—root, stem, leaf, and flower.	**Level 1 M1** L1 Parts 1, 2; L2 Part 1; L4 Parts 1, 2; L6 Part 1; L7 Parts 1, 2, 3, 4, 5; L11 Part 1; L15 Parts 1, 2, 3
b. Ask questions to compare and contrast the basic needs of plants (air, water, light, and nutrients) and animals (air, water, food, and shelter).	**Level 1 M1** L1 Parts 1, 2; L2 Part 1; L3 Parts 1, 2, 3; L4 Parts 1, 2; L5 Part 1; L6 Part 1; L7 Parts 1, 2, 3, 4, 5; L11 Part 1; L15 Parts 1, 2, 3
c. Design a solution to ensure that a plant or animal has all of its needs met.	**Level K M3** L1 Parts 1, 2, 3; L3 Parts 1, 2, 3, 4; L4 Part 1; L5 Parts 1, 2, 3; L6 Parts 1, 2; L7 Part 2; L8 Part 1; L9 Parts 1, 2, 3, 4; L10 Part 1; L11 Parts 1, 2, 3 **Level K M4** L1 Parts 1, 2; L2 Parts 1, 2; L3 Part 1; L4 Part 1; L11 Part 1

Science and Engineering Practices	Aligned *PhD Science* Lessons
Asking Questions and Defining Problems	**Level 1 M1** L1 Part 2; L7 Parts 1, 5 **Level 1 M2** L1 Part 2 **Level 1 M3** L1 Parts 2, 3; L5 Part 1; L7 Part 1; L10 Part 1 **Level 1 M4** L1 Part 2; L5 Part 3
Developing and Using Models	**Level 1 M1** L1 Part 2; L3 Parts 1, 2, 3; L4 Part 1; L5 Part 1; L6 Part 1; L7 Parts 2, 4, 5; L15 Parts 1, 2, 3 **Level 1 M2** L1 Parts 1, 2; L3 Part 1; L6 Parts 2, 3; L8 Parts 1, 2; L9 Part 1; L10 Parts 1, 2, 3 **Level 1 M3** L3 Part 1; L6 Part 1; L9 Part 1; L13 Parts 1, 2, 3, 4 **Level 1 M4** L1 Part 2; L3 Part 1; L8 Part 1
Planning and Carrying Out Investigations	**Level 1 M1** L10 Part 1 **Level 1 M2** L3 Part 1; L7 Parts 1, 2, 3; L9 Part 1 **Level 1 M3** L1 Parts 1, 2; L2 Part 2; L5 Part 1; L6 Part 3; L8 Part 2; L12 Part 3 **Level 1 M4** L1 Part 1; L2 Part 1; L3 Part 2; L7 Part 1
Analyzing and Interpreting Data	**Level 1 M1** L8 Part 1; L10 Part 2; L11 Part 1; L15 Parts 1, 2, 3 **Level 1 M2** L2 Part 1; L3 Part 3; L5 Part 1; L9 Part 1; L10 Parts 1, 2, 3 **Level 1 M3** L4 Parts 1, 2; L6 Part 2; L8 Part 1; L13 Parts 1, 2, 3, 4 **Level 1 M4** L2 Part 3; L7 Part 2; L8 Part 1
Constructing Explanations and Designing Solutions	**Level 1 M1** L4 Parts 1, 2; L7 Parts 3, 4; L8 Part 2; L12 Parts 1, 2; L13 Part 2; L14 Part 1; L15 Parts 1, 2, 3 **Level 1 M2** L3 Parts 2, 4; L4 Part 1; L5 Part 1; L6 Part 2; L10 Parts 1, 2, 3 **Level 1 M3** L7 Part 1; L12 Parts 3, 4; L13 Parts 1, 2, 3, 4 **Level 1 M4** L3 Part 1
Obtaining, Evaluating, and Communicating Information	**Level 1 M1** L1 Part 1; L2 Part 1; L9 Part 1; L11 Part 1; L13 Part 1 **Level 1 M4** L2 Part 2; L4 Parts 1, 2, 4; L5 Parts 1, 2; L6 Part 1; L9 Parts 1, 2, 3

Crosscutting Concepts	Aligned *PhD Science* Lessons
Patterns	**Level 1 M1** L2 Part 1; L3 Part 1; L8 Part 1; L10 Part 2; L11 Part 1; L12 Part 1; L13 Parts 1, 2; L14 Part 1; L15 Parts 1, 2, 3 **Level 1 M2** L1 Part 1; L2 Part 1; L7 Part 4 **Level 1 M3** L2 Parts 1, 3; L6 Part 1; L9 Part 1; L11 Part 1 **Level 1 M4** L2 Part 3; L3 Parts 1, 2; L4 Parts 3, 4, 5; L5 Part 2; L7 Part 3; L9 Parts 1, 2, 3
Cause and Effect	**Level 1 M2** L3 Parts 1, 3; L5 Part 1; L6 Part 2; L7 Part 3; L8 Part 2 **Level 1 M3** L3 Part 1; L6 Part 2; L7 Part 1; L8 Parts 1, 2; L9 Part 1; L13 Parts 1, 2, 3, 4
Systems and System Models	**Level 1 M1** L3 Part 3; L4 Part 1; L8 Part 2; L11 Part 1; L15 Parts 1, 2, 3 **Level 1 M2** L1 Part 2; L4 Part 1; L6 Parts 1, 2, 3; L8 Part 1; L9 Part 1; L10 Parts 1, 2, 3 **Level 1 M3** L1 Parts 2, 3; L4 Part 2; L5 Part 1; L10 Part 1; L12 Parts 2, 3, 4, 5; L13 Parts 1, 2, 3, 4
Energy and Matter	**Level 1 M3** L12 Parts 1, 5

PhD Science® Content Correlation to Georgia Standards of Excellence (GSE) for Science: Level 2

The *PhD Science* Level 2 curriculum mostly aligns with the Grade 2 GSE for Science. A detailed analysis of alignment follows.

Key: Module (M), Lesson (L)

Grade 2 Standards

Earth and Space Science	**Aligned *PhD Science* Lessons**
S2E1. Obtain, evaluate, and communicate information about stars having different sizes and brightness.	**Level 1 M4** L1 Parts 1, 2; L2 Parts 1, 2, 3; L3 Part 1; L5 Parts 1, 2, 3; L6 Part 1 **Level 5 M4** L10 Parts 1, 2; L13 Part 1; L14 Parts 1, 2, 3
a. Ask questions to describe the physical attributes (size and brightness) of stars.	**Level 1 M4** L5 Part 1; L6 Part 1 **Level 5 M4** L10 Parts 1, 2; L13 Part 1; L14 Parts 1, 2, 3
b. Construct an argument to support the claim that although the sun appears to be the brightest and largest star, it is actually medium in size and brightness.	**Level 1 M4** L2 Parts 1, 2, 3; L3 Part 1 **Level 5 M4** L10 Parts 1, 2; L13 Part 1; L14 Parts 1, 2, 3
S2E2. Obtain, evaluate, and communicate information to develop an understanding of the patterns of the sun and the moon and the sun's effect on Earth.	**Level 1 M4** L1 Parts 1, 2; L2 Parts 1, 2, 3; L3 Parts 1, 2; L5 Parts 1, 2, 3; L6 Part 1; L7 Parts 1, 2, 3; L8 Part 1; L9 Parts 1, 2, 3
a. Plan and carry out an investigation to determine the effect of the position of the sun in relation to a fixed object on Earth at various times of the day.	**Level 1 M4** L2 Parts 1, 2, 3; L3 Part 1
b. Design and build a structure that demonstrates how shadows change throughout the day.	**Level 1 M4** L2 Parts 1, 2, 3; L3 Part 1
c. Represent data in tables and/or graphs of the length of the day and night to recognize the change in seasons.	**Level 1 M4** L4 Parts 1, 2, 3, 4, 5
d. Use data from personal observations to describe, illustrate, and predict how the appearance of the moon changes over time in a pattern.	**Level 1 M4** L7 Parts 1, 2, 3; L8 Part 1; L9 Parts 1, 2, 3
S2E3. Obtain, evaluate, and communicate information about how weather, plants, animals, and humans cause changes to the environment.	**Level K M4** L2 Part 3; L3 Part 2; L4 Part 2; L5 Parts 1, 2; L7 Part 2; L12 Parts 1, 2, 3
a. Ask questions to obtain information about major changes to the environment in your community.	**Level K M4** L2 Part 3; L3 Part 2; L4 Part 2; L5 Parts 1, 2; L7 Part 2; L12 Parts 1, 2, 3
b. Construct an explanation of the causes and effects of a change to the environment in your community.	**Level K M4** L2 Part 3; L3 Part 2; L4 Part 2; L5 Parts 1, 2; L7 Part 2; L12 Parts 1, 2, 3

Physical Science	**Aligned *PhD Science* Lessons**
S2P1.Obtain, evaluate, and communicate information about the properties of matter and changes that occur in objects.	**Level 2 M1** L1 Parts 1, 2, 3; L2 Parts 1, 2, 3, 4; L3 Parts 1, 2; L4 Part 2; L5 Part 1; L6 Part 1; L8 Part 1; L12 Parts 1, 2, 3 **Level 2 M2** L2 Parts 1, 2, 3; L5 Part 1
a. Ask questions to describe and classify different objects according to their physical properties.	**Level 2 M1** L1 Part 3; L2 Parts 2, 3, 4; L3 Parts 1, 2; L4 Part 2; L5 Part 1; L6 Part 1; L8 Part 1; L12 Parts 1, 2, 3 **Level 2 M2** L2 Parts 1, 2, 3; L5 Part 1
b. Construct an explanation for how structures made from small pieces (linking cubes, building blocks) can be disassembled and then rearranged to make new and different structures.	**Level 2 M1** L4 Parts 1, 2; L11 Parts 1, 2, 3, 4, 5; L12 Parts 1, 2, 3
c. Provide evidence from observations to construct an explanation that some changes in matter caused by heating or cooling can be reversed and some changes are irreversible.	**Level 2 M1** L6 Parts 1, 2, 3; L7 Parts 1, 2; L8 Part 1; L12 Parts 1, 2, 3
S2P2. Obtain, evaluate, and communicate information to explain the effect of a force (a push or a pull) in the movement of an object (changes in speed and direction).	**Level K M2** L1 Parts 1, 2, 3; L2 Parts 1, 2, 3; L4 Part 1; L5 Parts 1, 2; L6 Parts 1, 2; L7 Part 1; L9 Parts 1, 2, 3
a. Plan and carry out an investigation to demonstrate how pushing and pulling on an object affects the motion of the object.	**Level K M2** L3 Parts 1, 2, 3; L4 Part 1; L5 Parts 1, 2, 3; L6 Parts 1, 2, 3; L7 Part 1; L8 Parts 1, 2, 3, 4; L9 Parts 1, 2, 3
b. Design a device to change the speed or direction of an object.	**Level K M2** L8 Parts 1, 2, 3, 4
c. Record and analyze data to decide if a design solution works as intended to change the speed or direction of an object with a force (a push or a pull).	**Level K M2** L8 Parts 3, 4

Life Science	**Aligned *PhD Science* Lessons**
S2L1. Obtain, evaluate, and communicate information about the life cycles of different living organisms.	**Level 2 M3** L2 Parts 1, 2, 3, 4; L12 Parts 1, 2 **Level 3 M3** L4 Parts 1, 2; L6 Part 1; L13 Part 1; L14 Part 1; L15 Parts 1, 2, 3
a. Ask questions to determine the sequence of the life cycle of common animals in your area: a mammal such as a cat, dog, or classroom pet; a bird such as a chicken; an amphibian such as a frog; and an insect such as a butterfly.	**Level 3 M3** L4 Parts 1, 2; L6 Part 1; L13 Part 1; L15 Parts 1, 2, 3
b. Plan and carry out an investigation of the life cycle of a plant by growing a plant from a seed and by recording changes over a period of time.	**Level 2 M3** L2 Parts 1, 2, 3, 4; L12 Parts 1, 2 **Level 3 M3** L7 Parts 1, 2
c. Construct an explanation of an animal's role in dispersing seeds or in the pollination of plants.	**Level 2 M3** L4 Parts 1, 2, 3, 4; L5 Part 1; L7 Parts 1, 2, 3, 4, 5; L8 Parts 1, 2; L9 Parts 1, 2; L10 Part 1; L11 Part 1; L13 Parts 1, 2, 3
d. Develop models to illustrate the unique and diverse life cycles of organisms other than humans.	**Level 3 M3** L4 Parts 1, 2; L13 Part 1

Science and Engineering Practices	Aligned *PhD Science* Lessons
Asking Questions and Defining Problems	**Level 2 M1** L1 Part 3 **Level 2 M2** L1 Part 2 **Level 2 M3** L1 Part 2; L2 Part 2; L3 Part 1; L7 Parts 1, 4 **Level 2 M4** L1 Parts 1, 2; L9 Part 1
Developing and Using Models	**Level 2 M1** L1 Part 1; L6 Parts 2, 3; L8 Part 1; L12 Parts 1, 2, 3 **Level 2 M2** L1 Part 2; L2 Part 1; L3 Parts 2, 3; L4 Part 1; L7 Part 1; L8 Parts 1, 2, 3 **Level 2 M3** L2 Part 1; L4 Part 2; L5 Part 1; L6 Part 1; L7 Parts 3, 4; L8 Part 2; L11 Part 1; L13 Parts 1, 2, 3 **Level 2 M4** L1 Part 2; L3 Part 2; L10 Part 1; L12 Parts 1, 2, 3
Planning and Carrying Out Investigations	**Level 2 M1** L1 Part 3; L9 Parts 1, 3; L11 Parts 1, 4; L12 Parts 1, 2, 3 **Level 2 M3** L1 Part 1; L2 Parts 2, 3, 4; L3 Part 1; L4 Parts 2, 3; L9 Part 2; L12 Part 1; L13 Parts 1, 2, 3 **Level 2 M4** L4 Part 1; L6 Part 2; L9 Part 2
Using Mathematics and Computational Thinking	**Level 2 M1** L9 Part 2 **Level 2 M2** L5 Part 2 **Level 2 M3** L4 Part 1; L12 Parts 1, 2; L13 Parts 1, 2, 3 **Level 2 M4** L3 Part 1; L9 Part 3; L10 Part 1
Constructing Explanations and Designing Solutions	**Level 2 M1** L2 Parts 2, 4; L3 Part 2; L5 Part 1; L7 Part 2; L8 Part 1; L10 Part 1; L11 Part 3; L12 Parts 1, 2, 3 **Level 2 M2** L1 Part 1; L2 Parts 2, 3; L4 Part 1; L5 Parts 1, 2, 3, 4; L6 Part 2; L7 Part 1; L8 Parts 1, 2, 3 **Level 2 M3** L9 Part 1
Obtaining, Evaluating, and Communicating Information	**Level 2 M1** L1 Part 2 **Level 2 M2** L1 Part 1; L6 Part 2 **Level 2 M3** L4 Part 4; L7 Parts 2, 5; L8 Part 2 **Level 2 M4** L2 Part 1; L5 Parts 1, 2; L6 Part 1; L7 Part 2; L8 Part 1; L11 Part 1; L12 Parts 1, 2, 3

Crosscutting Concepts	Aligned *PhD Science* Lessons
Patterns	**Level 2 M1** L2 Parts 1, 2, 3, 4 **Level 2 M4** L1 Part 2; L5 Part 2; L6 Parts 1, 3; L7 Parts 1, 2; L9 Part 2; L12 Parts 1, 2, 3
Cause and Effect	**Level 2 M1** L6 Parts 1, 2, 3; L7 Parts 1, 2; L8 Part 1; L12 Parts 1, 2, 3 **Level 2 M3** L2 Parts 2, 4; L3 Part 1; L4 Parts 3, 4; L11 Part 1
Scale, Proportion, and Quantity	**Level 2 M1** L3 Parts 1, 2 **Level 2 M2** L2 Part 1; L3 Parts 1, 2, 3, 4; L4 Part 1; L6 Part 1; L8 Parts 1, 2, 3 **Level 2 M3** L7 Part 2; L12 Parts 1, 2; L13 Part 3 **Level 2 M4** L2 Parts 1, 2; L3 Part 1; L5 Parts 1, 2; L8 Part 1; L9 Part 3; L10 Parts 1, 2; L11 Part 1; L12 Parts 1, 2, 3
Energy and Matter	**Level 2 M1** L4 Parts 1, 2; L11 Parts 3, 4; L12 Part 3 **Level 2 M2** L2 Part 3
Structure and Function	**Level 2 M1** L11 Parts 2, 5 **Level 2 M2** L5 Part 2 **Level 2 M3** L4 Part 2; L5 Part 1; L7 Parts 3, 4, 5; L8 Part 1; L9 Parts 1, 2; L13 Parts 1, 2, 3
Stability and Change	**Level 2 M2** L1 Parts 1, 2; L4 Part 1; L6 Parts 2, 3; L7 Part 1; L8 Parts 1, 2, 3 **Level 2 M3** L1 Parts 1, 2; L13 Parts 1, 2, 3

PhD Science® Content Correlation to Georgia Standards of Excellence (GSE) for Science: Level 3

The *PhD Science* Level 3 curriculum mostly aligns with the Grade 3 GSE for Science. A detailed analysis of alignment follows.

Key: Module (M), Lesson (L)

Grade 3 Standards

Earth and Space Science	**Aligned *PhD Science* Lessons**
S3E1. Obtain, evaluate, and communicate information about the physical attributes of rocks and soils.	**Level 2 M2** L2 Parts 2, 3 **Level 4 M1** L1 Part 2; L4 Parts 1, 2; L5 Parts 1, 2, 3; L6 Part 1; L7 Part 1; L15 Parts 1, 2, 3 **Level 5 M3** L7 Parts 1, 2; L8 Part 1
a. Ask questions and analyze data to classify rocks by their physical attributes (color, texture, luster, and hardness) using simple tests.	**Level 2 M2** L2 Parts 2, 3
b. Plan and carry out investigations to describe properties (color, texture, capacity to retain water, and ability to support growth of plants) of soils and soil types (sand, clay, loam).	**Level 2 M2** L2 Parts 2, 3 **Level 4 M1** L8 Parts 1, 2, 3, 4, 5
c. Make observations of the local environment to construct an explanation of how water and/or wind have made changes to soil and/or rocks over time.	**Level 4 M1** L1 Part 2; L4 Parts 1, 2; L5 Parts 1, 2, 3; L6 Part 1; L7 Part 1; L15 Parts 1, 2, 3 **Level 5 M3** L7 Parts 1, 2; L8 Part 1
S3E2. Obtain, evaluate, and communicate information on how fossils provide evidence of past organisms.	**Level 3 M2** L1 Part 2; L2 Parts 1, 2, 3; L3 Part 1; L4 Part 1; L9 Part 1; L12 Parts 1, 2, 3 **Level 4 M1** L2 Parts 1, 3; L3 Part 1; L15 Parts 1, 2, 3
a. Construct an argument from observations of fossils (authentic or reproductions) to communicate how they serve as evidence of past organisms and the environments in which they lived.	**Level 3 M2** L1 Part 2; L2 Parts 1, 2, 3; L3 Part 1; L4 Part 1; L9 Part 1; L12 Parts 1, 2, 3 **Level 4 M1** L2 Parts 1, 3; L3 Part 1; L15 Parts 1, 2, 3
b. Develop a model to describe the sequence and conditions required for an organism to become fossilized.	**Level 3 M2**; L2 Parts 1

Physical Science	**Aligned *PhD Science* Lessons**
S3P1. Obtain, evaluate, and communicate information about the ways heat energy is transferred and measured.	**Level K M1** L4 Part 2; L6 Part 1; L7 Parts 1, 2, 3, 4, 5 **Level 4 M2** L2 Parts 1, 2; L4 Part 1; L5 Parts 1, 2; L9 Parts 1, 2, 3
a. Ask questions to identify sources of heat energy.	**Level 4 M2** L2 Parts 1, 2; L4 Part 1; L5 Parts 1, 2; L9 Parts 1, 2, 3
b. Plan and carry out an investigation to gather data using thermometers to produce tables and charts that illustrate the effect of sunlight on various objects.	**Level K M1** L4 Part 2; L6 Part 1; L7 Parts 1, 2, 3, 4, 5
c. Use tools and every day materials to design and construct a device/structure that will increase/decrease the warming effects of sunlight on various materials.	**Level K M1** L7 Parts 1, 2, 3, 4, 5

Life Science	**Aligned *PhD Science* Lessons**
S3L1. Obtain, evaluate, and communicate information about the similarities and differences between plants, animals, and habitats found within geographic regions (Blue Ridge Mountains, Piedmont, Coastal Plains, Valley and Ridge, and Appalachian Plateau) of Georgia.	**Level K M3** L1 Parts 1, 2, 3; L3 Parts 1, 2, 3, 4; L4 Part 1; L5 Parts 1, 2, 3; L7 Parts 1, 2; L8 Part 1; L11 Parts 1, 2, 3 **Level 2 M4** L1 Parts 1, 2; L3 Parts 1, 2; L4 Part 1; L5 Part 1; L6 Parts 1, 2, 3; L7 Parts 1, 2; L8 Part 1; L9 Parts 1, 2, 3; L10 Parts 1, 2; L11 Part 1; L12 Parts 1, 2, 3 **Level 5 M2** L1 Parts 1, 2; L4 Part 1; L7 Parts 1, 2 *PhD Science does not specifically address Georgia.*
a. Ask questions to differentiate between plants, animals, and habitats found within Georgia's geographic regions.	**Level K M3** L1 Parts 1, 2, 3; L3 Parts 1, 2, 3, 4; L4 Part 1; L5 Parts 1, 2, 3; L7 Parts 1, 2; L8 Part 1; L11 Parts 1, 2, 3 **Level 2 M4** L1 Parts 1, 2; L3 Parts 1, 2; L4 Part 1; L5 Part 1; L6 Parts 1, 2, 3; L7 Parts 1, 2; L8 Part 1; L9 Parts 1, 2, 3; L10 Parts 1, 2; L11 Part 1; L12 Parts 1, 2, 3 **Level 5 M2** L1 Parts 1, 2; L4 Part 1; L7 Parts 1, 2 *PhD Science* does not specifically address Georgia.
b. Construct an explanation of how external features and adaptations (camouflage, hibernation, migration, mimicry) of animals allow them to survive in their habitat.	**Level 1 M1** L1 Parts 1, 2; L2 Part 1; L3 Parts 1, 2, 3; L5 Part 1; L7 Parts 1, 2, 3, 4, 5; L8 Parts 1, 2; L9 Part 1; L13 Parts 1, 2; L14 Part 1; L15 Parts 1, 2, 3 **Level 3 M2** L1 Part 1; L5 Parts 1, 2, 3; L6 Parts 1, 2, 3; L7 Part 1; L8 Parts 1, 2, 3, 4; L11 Parts 2, 3, 4; L12 Parts 1, 2, 3 **Level 4 M3** L1 Parts 1, 2; L2 Parts 1, 2, 3; L3 Part 1; L5 Part 1; L6 Part 3; L8 Parts 1, 2, 3; L9 Part 1; L10 Parts 1, 2; L11 Part 1; L14 Parts 1, 2, 3
c. Use evidence to construct an explanation of why some organisms can thrive in one habitat and not in another.	**Level 3 M2** L1 Part 1; L5 Parts 1, 2, 3; L7 Part 1; L8 Parts 1, 2, 3, 4; L9 Parts 1, 2; L10 Parts 1, 2, 3

Life Science	**Aligned *PhD Science* Lessons**
S3L2. Obtain, evaluate, and communicate information about the effects of pollution (air, land, and water) and humans on the environment.	**Level K M4** L6 Parts 1, 2, 3; L7 Parts 1, 2, 3; L8 Part 1; L9 Parts 1, 2 **Level 1 M3** L1 Parts 1, 2, 3 **Level 3 M3** L7 Part 1 **Level 4 M1** L9 Parts 1, 2; L10 Parts 1, 2; L11 Part 1 **Level 5 M3** L 1 Parts 12; L9 Parts 2, 3; L10 Parts 1, 2; L11 Part 1; L12 Parts 1, 2, 3, 4, 5; L13 Parts 1, 2, 3
a. Ask questions to collect information and create records of sources and effects of pollution on the plants and animals.	**Level K M4** L9 Parts 1, 2 **Level 3 M3** L7 Part 1
b. Explore, research, and communicate solutions, such as conservation of resources and recycling of materials, to protect plants and animals.	**Level K M4** L10 Parts 1, 2, 3, 4 **Level 1 M3** L1 Parts 1, 2, 3 **Level 2 M3** L7 Parts 1, 2, 3, 4, 5 **Level 4 M1** L10 Parts 1, 2; L11 Part 1 **Level 5 M3** L12 Parts 1, 2, 3, 4, 5

Science and Engineering Practices	Aligned *PhD Science* Lessons
Asking Questions and Defining Problems	**Level 3 M1** L1 Parts 1, 2; L4 Part 1; L5 Part 1; L7 Part 1; L8 Part 1; L11 Parts 1, 2, 3 **Level 3 M2** L1 Part 2; L11 Part 1 **Level 3 M3** L1 Part 3 **Level 3 M4** L1 Parts 1, 3; L3 Part 1; L10 Part 1; L11 Part 1; L12 Part 1; L13 Part 1; L14 Parts 1, 2, 3
Developing and Using Models	**Level 3 M1** L5 Part 2; L9 Part 1 **Level 3 M2** L1 Parts 1, 2; L2 Parts 2, 3; L5 Part 1; L6 Part 1; L7 Part 1; L8 Part 1; L10 Part 1; L11 Part 3; L12 Parts 1, 2, 3 **Level 3 M3** L5 Part 1 **Level 3 M4** L1 Part 2; L5 Part 2; L7 Part 2; L8 Part 1; L14 Parts 1, 2, 3
Planning and Carrying Out Investigations	**Level 3 M1** L9 Part 3 **Level 3 M3** L1 Parts 1, 2; L3 Part 1; L6 Part 1; L7 Parts 1, 2 **Level 3 M4** L2 Part 1; L3 Parts 1, 2, 3; L4 Part 1; L5 Part 1; L6 Part 2; L7 Part 1; L9 Part 1; L13 Parts 2, 4; L14 Parts 1, 2, 3
Using Mathematics and Computational Thinking	**Level 3 M1** L2 Parts 1, 2; L3 Part 2; L4 Part 1; L8 Part 1; L11 Parts 1, 2, 3 **Level 3 M4** L13 Part 3
Constructing Explanations and Designing Solutions	**Level 3 M1** L5 Part 2; L7 Part 2; L10 Part 2 **Level 3 M2** L5 Parts 2, 3; L7 Part 1; L8 Part 2; L9 Parts 1, 2; L10 Part 1; L11 Parts 2, 4 **Level 3 M3** L1 Part 3; L4 Part 2; L8 Part 2; L11 Part 1; L13 Part 1; L14 Part 1; L15 Parts 1, 2, 3 **Level 3 M4** L4 Part 1; L6 Part 1; L14 Parts 1, 2, 3

Science and Engineering Practices	**Aligned *PhD Science* Lessons**
Engaging in Argument from Evidence	**Level 3 M1** L6 Part 2; L8 Part 1; L9 Part 3; L10 Part 1; L11 Parts 1, 2, 3 **Level 3 M3** L2 Part 3; L5 Part 2; L8 Part 1; L9 Parts 2, 3; L10 Part 1; L11 Part 2; L14 Part 1; L15 Parts 1, 2, 3 **Level 3 M4** L6 Part 3
Obtaining, Evaluating, and Communicating Information	**Level 3 M1** L3 Part 3; L4 Part 1; L6 Part 1; L8 Part 1; L11 Parts 1, 2, 3 **Level 3 M2** L6 Parts 2, 3; L8 Parts 3, 4; L11 Part 4 **Level 3 M4** L11 Part 1

Crosscutting Concepts	Aligned *PhD Science* Lessons
Patterns	**Level 3 M1** L2 Part 3; L3 Part 2 **Level 3 M2** L2 Parts 1, 2, 3; L3 Part 1; L4 Part 1; L6 Part 2; L7 Part 1; L10 Part 1; L11 Part 4 **Level 3 M3** L1 Parts 1, 2, 3; L2 Parts 1, 3; L3 Part 1; L4 Part 1; L6 Part 1; L8 Parts 1, 2; L9 Parts 1, 2, 3; L10 Part 1; L15 Parts 1, 2, 3 **Level 3 M4** L2 Parts 2, 3; L3 Parts 2, 3; L4 Part 1; L12 Part 1; L14 Parts 1, 2, 3
Cause and Effect	**Level 3 M1** L1 Parts 1, 2; L3 Parts 1, 3; L4 Part 1; L5 Part 1; L6 Parts 1, 2; L7 Part 1; L8 Part 1; L9 Parts 1, 2, 3; L10 Part 2; L11 Parts 1, 2, 3 **Level 3 M2** L8 Parts 1, 2, 3, 4; L9 Part 2; L10 Part 1; L11 Part 1; L12 Parts 1, 2, 3 **Level 3 M3** L5 Parts 1, 2; L7 Part 1; L10 Part 1; L12 Part 2; L13 Part 1; L14 Part 1; L15 Parts 1, 2, 3 **Level 3 M4** L1 Parts 2, 3; L5 Parts 1, 2; L6 Part 3; L7 Parts 1, 2; L8 Part 1; L9 Part 1; L10 Parts 1, 2, 3; L11 Part 1; L14 Parts 1, 2, 3
Systems and System Models	**Level 3 M1** L5 Part 2; L7 Part 2; L8 Part 1; L10 Part 1 **Level 3 M2** L1 Part 1; L5 Parts 1, 2, 3; L6 Part 1; L7 Part 1; L11 Parts 2, 3, 4; L12 Parts 1, 2, 3 **Level 3 M3** L12 Part 1 **Level 3 M4** L6 Parts 1, 2; L9 Part 1; L12 Part 1; L13 Parts 2, 3, 4, 5; L14 Parts 1, 2, 3
Energy and Matter	**Level 4 M2** L3 Part 1; L6 Parts 1, 2, 3; L7 Part 1; L9 Parts 1, 2, 3 **Level 4 M3** L4 Part 4 **Level 5 M1** L7 Part 2; L8 Part 3; L9 Part 1; L11 Parts 1, 2, 3 **Level 5 M2** L5 Parts 1, 2; L8 Parts 1, 2; L9 Part 1; L10 Part 1; L13 Parts 1, 2, 3
Structure and Function	**Level 3 M3** L2 Part 2; L12 Part 1; L13 Part 2; L14 Part 1; L15 Parts 1, 2, 3
Stability and Change	**Level 3 M3** L4 Part 2; L6 Part 1; L7 Part 2; L11 Parts 1, 2

PhD Science® Content Correlation to Georgia Standards of Excellence (GSE) for Science: Level 4

The *PhD Science* Level 4 curriculum partially aligns with the Grade 4 GSE for Science. A detailed analysis of alignment follows.

Key: Module (M), Lesson (L)

Grade 4 Standards

Earth and Space Science	**Aligned *PhD Science* Lessons**
S4E1. Obtain, evaluate, and communicate information to compare and contrast the physical attributes of stars and planets.	**Level 1 M4** L5 Parts 1, 2, 3 **Level 5 M4** L10 Parts 1, 2; L11 Parts 1, 2; L12 Parts 1, 2 *PhD Science* K–5 curriculum does not address physical attributes of planets.
a. Ask questions to compare and contrast technological advances that have changed the amount and type of information on distant objects in the sky.	**Level 1 M4** L5 Part 3 **Level 5 M4** L 4 Part 1; L5 Part 1 and 2; L10 Part 2
b. Construct an argument on why some stars (including the Earth's sun) appear to be larger or brighter than others.	**Level 5 M4** L10 Parts 1, 2; L13 Part 1; L14 Parts 1, 2, 3
c. Construct an explanation of the differences between stars and planets.	**Level 1 M4** L5 Parts 1, 2, 3; L6 Part 1 **Level 5 M4** L10 Parts 1, 2; L11 Parts 1, 2; L12 Parts 1, 2; L13 Part 1 *PhD Science* K–5 curriculum does not address planets.
d. Evaluate strengths and limitations of models of our solar system in describing relative size, order, appearance, and composition of planets and the sun.	**Level 1 M4** L2 Parts 1, 2, 3; L3 Part 1 **Level 5 M4** L1 Parts 1, 2; L3 Part 1; L4 Parts 1, 2; L5 Parts 1, 2, 3; L6 Part 1 *PhD Science* K–5 curriculum does not address models of planets within the solar system or composition of planets

Earth and Space Science	**Aligned *PhD Science* Lessons**
S4E2. Obtain, evaluate, and communicate information to model the effects of the position and motion of the Earth and the moon in relation to the sun as observed from the Earth.	**Level 1 M4** L4 Parts 1, 2, 3, 4, 5 **Level 5 M4** L1 Parts 1, 2; L3 Part 1; L4 Parts 1, 2; L5 Parts 1, 2, 3; L6 Part 1; L7 Part 1; L8 Parts 1, 2, 3; L9 Part 1; L14 Parts 1, 2, 3
a. Develop a model to support an explanation of why the length of day and night change throughout the year.	**Level 1 M4** L4 Parts 1, 2, 3, 4, 5 **Level 5 M4** L4 Parts 1, 2
b. Develop a model based on observations to describe the repeating pattern of the phases of the moon (new, crescent, quarter, gibbous, and full).	**Level 5 M4** L8 Parts 1, 2, 3
c. Construct an explanation of how the Earth's orbit, with its consistent tilt, affects seasonal changes.	*PhD Science* K–5 curriculum does not address Earth's tilt.
S4E3. Obtain, evaluate, and communicate information to demonstrate the water cycle.	**Level 2 M4** L2 Part 3 **Level 5 M3** L2 Parts 1, 2, 3; L3 Parts 1, 2; L4 Part 1
a. Plan and carry out investigations to observe the flow of energy in water as it changes states from solid (ice) to liquid (water) to gas (water vapor) and changes from gas to liquid to solid.	**Level 2 M4** L2 Part 3 **Level 5 M3** L3 Parts 1, 2; L4 Part 1
b. Develop models to illustrate multiple pathways water may take during the water cycle (evaporation, condensation, and precipitation).	**Level 5 M3** L3 Parts 1, 2; L4 Part 1
S4E4. Obtain, evaluate, and communicate information to predict weather events and infer weather patterns using weather charts/maps and collected weather data.	**Level K M1** L3 Parts 1, 2, 3, 4; L8 Parts 1, 2, 3, 4; L9 Part 1 **Level 3 M1** L1 Parts 1, 2; L2 Parts 1, 2, 3; L3 Parts 1, 2, 3; L4 Part 1; L5 Parts 1, 2; L6 Parts 1, 2; L7 Parts 1, 2; L8 Part 1; L9 Parts 1, 2, 3; L10 Parts 1, 2; L11 Parts 1, 2, 3
a. Construct an explanation of how weather instruments (thermometer, rain gauge, barometer, wind vane, and anemometer) are used in gathering weather data and making forecasts.	**Level K M1** L3 Parts 1, 2, 3, 4; L8 Parts 1, 2, 3, 4; L9 Part 1 **Level 3 M1** L2 Parts 1, 2, 3; L4 Parts 1, 2, 3
b. Interpret data from weather maps, including fronts (warm, cold, and stationary), temperature, pressure, and precipitation to make an informed prediction about tomorrow's weather.	**Level 3 M1** L2 Parts 2, 3; L3 Parts 1, 2; L4 Part 1; L11 Parts 1, 2, 3
c. Ask questions and use observations of cloud types (cirrus, stratus, and cumulus) and data of weather conditions to predict weather events.	**Level 3 M1** L4 Parts 1, 2, 3
d. Construct an explanation based on research to communicate the difference between weather and climate.	**Level 3 M1** L2 Parts 1, 2; L4 Part 1; L8 Part 1; L11 Parts 1, 2, 3

Physical Science	**Aligned *PhD Science* Lessons**
S4P1. Obtain, evaluate, and communicate information about the nature of light and how light interacts with objects.	**Level 1 M2** L1 Parts 1, 2; L6 Parts 1, 2, 3; L7 Parts 1, 2, 3, 4; L8 Parts 1, 2; L9 Part 1; L10 Parts 1, 2, 3 **Level 4 M4** L5 Parts 1, 2, 3; L6 Part 1; L7 Part 1; L9 Part 1; L10 Parts 1, 3, 4; L11 Parts 2, 3, 4; L12 Parts 1, 2, 3
a. Plan and carry out investigations to observe and record how light interacts with various materials to classify them as opaque, transparent, or translucent.	**Level 1 M2** L1 Parts 1, 2; L6 Parts 1, 2, 3; L7 Parts 1, 2, 3, 4; L8 Parts 1, 2; L9 Part 1; L10 Parts 1, 2, 3
b. Plan and carry out investigations to describe the path light travels from a light source to a mirror and how it is reflected by the mirror using different angles.	**Level 1 M2** L8 Parts 1, 2 **Level 4 M4** L5 Parts 1, 2, 3; L7 Part 1; L10 Parts 1, 2, 3, 4
c. Plan and carry out an investigation utilizing everyday materials to explore examples of when light is refracted.	*PhD Science* K–5 curriculum does not address light refraction.
S4P2. Obtain, evaluate, and communicate information about how sound is produced and changed and how sound and/or light can be used to communicate.	**Level 1 M3** L1 Parts 1, 2, 3; L2 Parts 1, 2, 3; L3 Part 1; L4 Parts 1, 2; L5 Part 1; L6 Parts 1, 2, 3; L7 Part 1; L8 Parts 1, 2; L9 Part 1; L12 Part 4; L10 Parts 1, 2; L11 Part 1; L12 Parts 1, 2, 3, 4, 5; L13 Parts 1, 2, 3, 4 **Level 4 M4** L2 Parts 1, 2; L3 Parts 1, 2; L4 Part 1; L12 Parts 1, 2, 3
a. Plan and carry out an investigation utilizing everyday objects to produce sound and predict the effects of changing the strength or speed of vibrations.	**Level 1 M3** L1 Parts 1, 2, 3; L2 Parts 1, 2, 3; L3 Part 1; L4 Parts 1, 2; L5 Part 1; L6 Parts 1, 2, 3; L7 Part 1; L8 Parts 1, 2; L9 Part 1; L12 Part 4; L10 Parts 1, 2; L11 Part 1; L12 Parts 1, 2, 3, 4, 5; L13 Parts 1, 2, 3, 4
b. Design and construct a device to communicate across a distance using light and/or sound.	**Level 1 M3** L10 Parts 1, 2; L11 Part 1; L12 Parts 1, 2, 3, 4, 5 **Level 4 M4** L2 Parts 1, 2; L3 Parts 1, 2; L4 Part 1; L12 Parts 1, 2, 3
S4P3. Obtain, evaluate, and communicate information about the relationship between balanced and unbalanced forces.	**Level 3 M4** L5 Parts 1, 2; L6 Parts 1, 2, 3; L7 Parts 1, 2; L8 Part 1; L9 Part 1; L14 Parts 1, 2, 3 **Level 5 M4** L2 Parts 1, 2; L9 Part 1; L14 Parts 1, 2, 3
a. Plan and carry out an investigation on the effects of balanced and unbalanced forces on an object and communicate the results.	**Level 3 M4** L5 Parts 1, 2; L6 Parts 1, 2, 3; L7 Parts 1, 2; L8 Part 1; L9 Part 1; L14 Parts 1, 2, 3
b. Construct an argument to support the claim that gravitational force affects the motion of an object.	**Level 3 M4** L1 Parts 1, 2; L6 Parts 2, 3; L7 Part 2; L8 Part 1; L9 Part 1 **Level 5 M4** L2 Parts 1, 2; L9 Part 1; L14 Parts 1, 2, 3
c. Ask questions to identify and explain the uses of simple machines (lever, pulley, wedge, inclined plane, wheel and axle, and screw) and how forces are changed when simple machines are used to complete tasks.	**Level 3 M4** L6 Parts 1, 2, 3

Life Science	**Aligned *PhD Science* Lessons**
S4L1. Obtain, evaluate, and communicate information about the roles of organisms and the flow of energy within an ecosystem.	**Level 5 M2** L1 Parts 1, 2; L2 Parts 1, 2, 3; L3 Part 1; L4 Part 1; L5 Parts 1, 2; L6 Part 1; L7 Part 2; L10 Part 1; L11 Parts 1, 2; L12 Parts 1, 2, 3; L13 Parts 1, 2, 3
a. Develop a model to describe the roles of producers, consumers, and decomposers in a community.	**Level 5 M2** L1 Parts 1, 2; L3 Part 1; L4 Part 1; L5 Parts 1, 2; L6 Part 1; L7 Part 2; L10 Part 1; L11 Parts 1, 2; L12 Parts 1, 2, 3; L13 Parts 1, 2, 3
b. Develop simple models to illustrate the flow of energy through a food web/food chain beginning with sunlight and including producers, consumers, and decomposers.	**Level 5 M2** L1 Parts 1, 2; L2 Parts 1, 2, 3; L3 Part 1; L4 Part 1; L5 Parts 1, 2; L6 Part 1; L7 Part 2; L10 Part 1; L11 Parts 1, 2; L12 Parts 1, 2, 3; L13 Parts 1, 2, 3
c. Design a scenario to demonstrate the effect of a change on an ecosystem.	**Level 3 M2** L8 Parts 1, 3; L9 Part 2; L10 Part 1; L12 Parts 1, 2, 3 **Level 5 M2** L11 Parts 1, 2; L12 Parts 1, 2, 3; L13 Parts 1, 2, 3
d. Use printed and digital data to develop a model illustrating and describing changes to the flow of energy in an ecosystem when plants or animals become scarce, extinct, or overabundant.	**Level 5 M2** L11 Parts 1, 2; L12 Parts 1, 2, 3; L13 Parts 1, 2, 3

Science and Engineering Practices	Aligned *PhD Science* Lessons
Asking Questions and Defining Problems	**Level 4 M2** L1 Parts 1, 3; L3 Part 2; L4 Part 1; L8 Part 2 **Level 4 M4** L1 Part 1; L9 Part 1
Developing and Using Models	**Level 4 M1** L1 Part 2; L2 Part 2; L3 Part 1; L4 Part 2; L7 Part 1; L9 Part 1; L14 Part 1; L15 Parts 1, 2, 3 **Level 4 M2** L1 Parts 2, 3; L3 Part 1; L5 Part 2; L6 Part 2; L7 Part 1; L9 Parts 1, 2, 3 **Level 4 M3** L1 Parts 1, 2; L4 Parts 1, 3, 4; L6 Parts 1, 2; L7 Part 1; L13 Part 1; L14 Parts 1, 2, 3 **Level 4 M4** L1 Part 2; L3 Part 1; L4 Part 1; L5 Parts 1, 2, 3; L6 Part 1; L7 Parts 1, 2; L9 Part 1; L10 Parts 2, 3; L12 Parts 1, 2, 3
Planning and Carrying Out Investigations	**Level 4 M1** L1 Part 1; L4 Part 1; L5 Part 1; L8 Part 3; L15 Parts 1, 2, 3 **Level 4 M2** L2 Part 1; L4 Part 1; L5 Part 1; L6 Part 3 **Level 4 M3** L8 Part 1
Analyzing and Interpreting Data	**Level 4 M1** L13 Part 1; L14 Part 1 **Level 4 M2** L3 Part 2; L4 Part 1; L9 Parts 1, 2, 3 **Level 4 M3** L8 Part 2 **Level 4 M4** L2 Part 2; L8 Part 1; L10 Part 4; L11 Part 3; L12 Parts 1, 2, 3
Constructing Explanations and Designing Solutions	**Level 4 M1** L2 Parts 1, 3; L5 Part 2; L8 Parts 2, 4; L9 Part 2; L11 Part 1; L12 Part 1; L13 Part 2; L15 Parts 1, 2, 3 **Level 4 M2** L2 Part 2; L7 Part 1; L8 Parts 3, 4, 5, 6, 7; L9 Parts 1, 2, 3 **Level 4 M3** L2 Parts 1, 2; L4 Part 2; L5 Part 1; L6 Part 3; L10 Part 2; L13 Part 1; L14 Parts 1, 2, 3 **Level 4 M4** L7 Part 1; L10 Part 4; L11 Parts 1, 2, 4; L12 Parts 1, 2, 3
Engaging in Argument from Evidence	**Level 4 M3** L8 Part 3; L12 Part 1; L14 Parts 1, 2, 3 **Level 4 M4** L3 Parts 1, 2
Obtaining, Evaluating, and Communicating Information	**Level 4 M1** L2 Parts 1, 3; L3 Part 1; L6 Part 1; L7 Part 1; L8 Parts 1, 5; L10 Parts 1, 2; L11 Part 1; L14 Part 1 **Level 4 M3** L2 Parts 1, 3; L3 Part 1; L9 Part 1; L11 Part 1; L12 Part 2; L14 Parts 1, 2, 3 **Level 4 M4** L1 Part 1

Crosscutting Concepts	Aligned *PhD Science* Lessons
Patterns	**Level 4 M1** L2 Part 2; L3 Part 1; L5 Part 3; L11 Part 1; L12 Part 1; L13 Part 1; L14 Part 1; L15 Parts 1, 2, 3 **Level 4 M2** L2 Part 2; L3 Part 2; L4 Part 1; L9 Parts 1, 2, 3 **Level 4 M3** L1 Parts 1, 2; L6 Parts 1, 2; L7 Part 1; L8 Parts 1, 2; L13 Part 1; L14 Parts 1, 2, 3 **Level 4 M4** L5 Part 2; L7 Parts 1, 2; L11 Part 1; L12 Parts 1, 2, 3
Cause and Effect	**Level 4 M1** L1 Part 2; L4 Parts 1, 2; L5 Part 1; L6 Part 1; L7 Part 1; L8 Parts 1, 2, 3, 4, 5; L10 Part 2; L11 Part 1; L13 Part 2; L14 Part 1; L15 Parts 1, 2, 3 **Level 4 M2** L1 Part 1; L5 Part 1; L7 Part 1; L9 Parts 1, 2, 3 **Level 4 M3** L4 Parts 2, 3; L5 Part 1; L7 Part 1; L9 Part 1; L10 Part 1; L11 Part 1; L14 Parts 1, 2, 3 **Level 4 M4** L1 Part 1; L2 Part 1; L5 Part 2; L6 Part 1; L7 Part 2; L8 Part 1; L9 Part 1; L10 Parts 3, 4; L12 Parts 1, 2, 3
Scale, Proportion, and Quantity	**Level 4 M1** L1 Part 1; L2 Parts 1, 3; L3 Part 1; L11 Part 1
Systems and System Models	**Level 4 M2** L1 Parts 2, 3; L2 Part 1; L4 Part 1; L5 Part 2; L8 Parts 1, 2, 4, 5, 6, 7; L9 Parts 1, 2, 3 **Level 4 M4** L1 Part 2; L2 Part 2; L3 Parts 1, 2; L4 Part 1; L5 Parts 1, 3; L9 Part 1; L10 Part 1; L11 Parts 3, 4; L12 Parts 1, 2, 3
Energy and Matter	**Level 4 M2** L3 Part 1; L6 Parts 1, 2, 3; L7 Part 1; L9 Parts 1, 2, 3 **Level 4 M3** L4 Part 4
Structure and Function	**Level 4 M1** L8 Part 2 **Level 4 M2** L8 Part 3 **Level 4 M3** L2 Parts 1, 2, 3; L3 Part 1; L6 Part 3; L9 Part 1; L10 Part 2; L12 Part 2; L13 Part 1; L14 Parts 1, 2, 3

PhD Science® Content Correlation to Georgia Standards of Excellence (GSE) for Science: Level 5

The *PhD Science* Level 5 curriculum partially aligns with the Grade 5 GSE for Science. A detailed analysis of alignment follows.

Key: Module (M), Lesson (L)

Grade 5 Standards

Earth and Space Science	**Aligned *PhD Science* Lessons**
S5E1. Obtain, evaluate, and communicate information to identify surface features on the Earth caused by constructive and/or destructive processes.	**Level 4 M1** L1 Parts 1, 2; L2 Parts 1, 2, 3; L3 Part 1; L4 Parts 1, 2; L5 Parts 1, 2, 3; L6 Part 1; L7 Part 1; L9 Parts 1, 2; L11 Part 1; L12 Part 1; L13 Parts 1, 2; L14 Part 1; L15 Parts 1, 2, 3 **Level 5 M3** L9 Parts 2, 3
a. Construct an argument supported by scientific evidence to identify surface features (examples could include deltas, sand dunes, mountains, volcanoes) as being caused by constructive and/or destructive processes (examples could include deposition, weathering, erosion, and impact of organisms).	**Level 4 M1** L1 Parts 1, 2; L2 Parts 1, 2, 3; L3 Part 1; L4 Parts 1, 2; L5 Parts 1, 2, 3; L6 Part 1; L7 Part 1; L9 Parts 1, 2; L11 Part 1; L12 Part 1; L13 Parts 1, 2; L14 Part 1; L15 Parts 1, 2, 3
b. Develop simple interactive models to collect data that illustrate how changes in surface features are/were caused by constructive and/or destructive processes.	**Level 4 M1** L1 Parts 1, 2; L2 Parts 1, 2, 3; L3 Part 1; L4 Parts 1, 2; L5 Parts 1, 2, 3; L6 Part 1; L7 Part 1; L9 Parts 1, 2; L11 Part 1; L12 Part 1; L13 Parts 1, 2; L14 Part 1; L15 Parts 1, 2, 3
c. Ask questions to obtain information on how technology is used to limit and/or predict the impact of constructive and destructive processes.	**Level 4 M1** L8 Parts 1, 2, 3, 4, 5; L14 Part 1 **Level 5 M3** L9 Parts 2, 3; L10 Parts 1, 2; L11 Part 1; L12 Parts 2, 3, 4, 5; L13 Parts 1, 2

Physical Science	**Aligned *PhD Science* Lessons**
S5P1. Obtain, evaluate, and communicate information to explain the differences between a physical change and a chemical change.	**Level 2 M1** L6 Parts 1, 2, 3; L7 Parts 1, 2; L8 Part 1; L12 Parts 1, 2, 3 **Level 5 M1** L1 Parts 1, 2; L8 Parts 1, 2, 3; L9 Part 1; L10 Parts 1, 2, 3, 4, 5; L11 Parts 1, 2, 3 *PhD Science* K–5 curriculum does not introduce the terms *physical change* nor *chemical change*.
a. Plan and carry out investigations of physical changes by manipulating, separating, and mixing dry and liquid materials.	**Level 2 M1** L6 Parts 1, 2, 3; L7 Parts 1, 2 **Level 5 M1** L7 Parts 1, 2; L8 Parts 1, 2, 3; L10 Parts 1, 2, 3, 4, 5 *PhD Science* K–5 curriculum does not introduce the term *physical change*.
b. Construct an argument based on observations to support a claim that the physical changes in the state of water are due to temperature changes, which cause small particles that cannot be seen to move differently.	**Level 2 M1** L6 Parts 1, 2, 3 **Level 5 M1** L5 Parts 1, 2 *PhD Science* K–5 curriculum does not introduce the term *physical change*.
c. Plan and carry out an investigation to determine if a chemical change occurred based on observable evidence (color, gas, temperature change, odor, new substance produced).	**Level 2 M1** L6 Parts 1, 2, 3; L7 Parts 1, 2; L8 Part 1; L12 Parts 1, 2, 3 **Level 5 M1** L1 Parts 1, 2; L8 Parts 1, 2, 3; L9 Part 1; L10 Parts 1, 2, 3, 4, 5; L11 Parts 1, 2, 3 *PhD Science* K–5 curriculum does not introduce the term *chemical change*.
S5P2. Obtain, evaluate, and communicate information to investigate electricity.	**Level 3 M4** L10 Part 3 **Level 4 M2** L1 Parts 1, 2, 3; L5 Part 2; L6 Parts 1, 2, 3; L8 Parts 1, 2, 3, 4, 5, 6, 7
a. Obtain and combine information from multiple sources to explain the difference between naturally occurring electricity (static) and human-harnessed electricity.	**Level 3 M4** L10 Part 3 **Level 4 M2** L1 Parts 1, 2, 3; L5 Part 2; L6 Parts 1, 2, 3; L8 Parts 1, 2, 3, 4, 5, 6, 7
b. Design a complete, simple electric circuit, and explain all necessary components.	**Level 4 M2** L5 Parts 1, 2; L6 Parts 1, 2, 3; L8 Parts 1, 2, 3, 4, 5, 6, 7
c. Plan and carry out investigations on common materials to determine if they are insulators or conductors of electricity.	*PhD Science* K–5 curriculum does not address insulators or conductors.

Physical Science	**Aligned *PhD Science* Lessons**
S5P3. Obtain, evaluate, and communicate information about magnetism and its relationship to electricity.	**Level 3 M4** L10 Parts 1, 2, 3; L11 Part 1; L12 Part 1; L13 Parts 1, 2, 3, 4, 5; L14 Parts 1, 2, 3
a. Construct an argument based on experimental evidence to communicate the differences in function and purpose of an electromagnet and a magnet.	**Level 3 M4** L10 Parts 1, 2, 3; L11 Part 1; L12 Part 1; L13 Parts 1, 2, 3, 4, 5; L14 Parts 1, 2, 3
b. Plan and carry out an investigation to observe the interaction between a magnetic field and a magnetic object.	**Level 3 M4** L10 Parts 1, 2, 3; L11 Part 1; L12 Part 1; L13 Parts 1, 2, 3, 4, 5; L14 Parts 1, 2, 3

Life Science	**Aligned *PhD Science* Lessons**
S5L1. Obtain, evaluate, and communicate information to group organisms using scientific classification procedures.	**Level 2 M3** L9 Parts 1, 2; L10 Part 1
a. Develop a model that illustrates how animals are sorted into groups (vertebrate and invertebrate) and how vertebrates are sorted into groups (fish, amphibian, reptile, bird, and mammal) using data from multiple sources.	*PhD Science* K–5 curriculum does not address vertebrates or invertebrates.
b. Develop a model that illustrates how plants are sorted into groups (seed producers, non-seed producers) using data from multiple sources.	**Level 2 M3** L9 Parts 1, 2; L10 Part 1
S5L2. Obtain, evaluate, and communicate information showing that some characteristics of organisms are inherited and other characteristics are acquired.	**Level 3 M3** L1 Parts 1, 2, 3; L2 Parts 1, 2, 3; L3 Part 1; L5 Parts 1, 2; L6 Part 1; L7 Parts 1, 2; L8 Parts 1, 2; L9 Parts 1, 2, 3; L10 Part 1; L11 Parts 1, 2; L14 Part 1; L15 Parts 1, 2, 3
a. Ask questions to compare and contrast instincts and learned behaviors.	**Level 3 M3** L5 Parts 1, 2; L6 Part 1; L7 Parts 1, 2; L11 Parts 1, 2; L15 Parts 1, 2, 3
b. Ask questions to compare and contrast inherited and acquired physical traits.	**Level 3 M3** L1 Parts 1, 2, 3; L2 Parts 1, 2, 3; L3 Part 1; L5 Parts 1, 2; L6 Part 1; L7 Parts 1, 2; L8 Parts 1, 2; L9 Parts 1, 2, 3; L10 Part 1; L11 Parts 1, 2; L14 Part 1; L15 Parts 1, 2, 3
S5L3. Obtain, evaluate, and communicate information to compare and contrast the parts of plant and animal cells.	*PhD Science* K–5 curriculum does not address plant or animal cells.
a. Gather evidence by utilizing technology tools to support a claim that plants and animals are comprised of cells too small to be seen without magnification.	*PhD Science* K–5 curriculum does not address plant or animal cells.
b. Develop a model to identify and label parts of a plant cell (membrane, wall, cytoplasm, nucleus, chloroplasts) and of an animal cell (membrane, cytoplasm, and nucleus).	*PhD Science* K–5 curriculum does not address plant or animal cells.
c. Construct an explanation that differentiates between the structure of plant and animal cells.	*PhD Science* K–5 curriculum does not address plant or animal cells.

Life Science	**Aligned *PhD Science* Lessons**
S5L4. Obtain, evaluate, and communicate information about how microorganisms benefit or harm larger organisms.	**Level 5 M2** L5 Parts 1, 2; L6 Part 1 *PhD Science* K–5 curriculum does not introduce the term *microorganism*.
a. Construct an argument using scientific evidence to support a claim that some microorganisms are beneficial.	**Level 5 M2** L5 Parts 1, 2; L6 Part 1 *PhD Science* K–5 curriculum does not introduce the term *microorganism*.
b. Construct an argument using scientific evidence to support a claim that some microorganisms are harmful.	*PhD Science* K–5 curriculum does not address harmful microorganisms.

Science and Engineering Practices	Aligned *PhD Science* Lessons
Asking Questions and Defining Problems	**Level 5 M1** L1 Part 2; L4 Part 1; L10 Part 1 **Level 5 M2** L1 Part 2; L10 Part 1; L12 Parts 1, 2 **Level 5 M3** L12 Part 1 **Level 5 M4** L1 Part 2; L10 Part 2
Developing and Using Models	**Level 5 M1** L1 Part 1; L3 Parts 1, 3; L4 Part 1; L5 Part 1; L6 Part 1; L7 Part 2; L8 Part 2; L9 Part 1; L11 Parts 1, 2, 3 **Level 5 M2** L1 Parts 1, 2; L3 Part 1; L5 Part 2; L7 Part 2; L9 Part 1; L10 Part 1 **Level 5 M3** L1 Parts 1, 2; L3 Part 1; L4 Part 1; L6 Part 1; L7 Part 1; L8 Part 1; L11 Part 1; L13 Parts 1, 2, 3 **Level 5 M4** L1 Parts 1, 2; L2 Part 1; L4 Part 1; L5 Parts 1, 2; L6 Part 1; L7 Part 1; L8 Parts 2, 3; L9 Part 1; L11 Parts 1, 2; L12 Part 2; L13 Part 1; L14 Parts 1, 2, 3
Planning and Carrying Out Investigations	**Level 5 M1** L5 Part 2; L7 Part 1; L8 Parts 1, 2; L9 Part 1; L10 Parts 2, 3; L11 Parts 1, 2, 3 **Level 5 M2** L2 Parts 1, 2
Analyzing and Interpreting Data	**Level 5 M2** L4 Part 1; L7 Part 1; L8 Part 1; L12 Part 2 **Level 5 M3** L2 Part 1; L5 Part 1; L9 Part 1 **Level 5 M4** L3 Part 1; L8 Parts 1, 2; L9 Part 1
Constructing Explanations and Designing Solutions	**Level 5 M1** L2 Part 1; L3 Part 2; L4 Part 1; L5 Part 2; L6 Part 1; L8 Part 3; L9 Part 1; L10 Parts 4, 5; L11 Parts 1, 2, 3 **Level 5 M2** L8 Part 2; L11 Part 2; L12 Part 3; L13 Parts 1, 2, 3 **Level 5 M3** L3 Part 2; L12 Parts 2, 3, 4, 5 **Level 5 M4** L2 Part 2; L10 Part 1; L12 Part 1; L13 Part 1
Engaging in Argument from Evidence	**Level 5 M2** L2 Part 3; L5 Part 1; L6 Part 1; L8 Part 1; L10 Part 1; L11 Part 1; L13 Parts 1, 2, 3 **Level 5 M4** L4 Part 2; L5 Part 3
Obtaining, Evaluating, and Communicating Information	**Level 5 M2** L3 Part 1; L11 Part 1 **Level 5 M3** L2 Part 2; L3 Part 2; L6 Part 1; L7 Part 2; L8 Part 1; L9 Part 2; L10 Parts 1, 2; L11 Part 1; L13 Parts 1, 2, 3 **Level 5 M4** L8 Part 3; L10 Part 1; L13 Part 1; L14 Parts 1, 2, 3

Crosscutting Concepts	Aligned *PhD Science* Lessons
Patterns	**Level 5 M1** L2 Part 1 **Level 5 M2** L8 Part 1 **Level 5 M3** L6 Part 1; L9 Part 1; L12 Part 1 **Level 5 M4** L1 Part 1; L5 Part 2; L6 Part 1; L8 Parts 1, 2; L9 Part 1; L12 Part 1; L14 Part 3
Cause and Effect	**Level 5 M1** L1 Part 2; L3 Parts 1, 3 **Level 5 M2** L1 Part 2; L2 Parts 1, 2, 3; L4 Part 1; L11 Part 1; L12 Parts 1, 2, 3; L13 Parts 1, 2, 3 **Level 5 M3** L3 Part 1; L5 Part 1; L8 Part 1; L9 Parts 2, 3; L10 Part 2; L11 Part 1; L12 Part 3; L13 Parts 1, 2, 3 **Level 5 M4** L2 Part 1; L3 Part 1; L4 Parts 1, 2; L5 Part 1; L6 Part 1; L7 Part 1; L9 Part 1; L11 Parts 1, 2; L14 Parts 1, 2, 3
Scale, Proportion, and Quantity	**Level 5 M1** L5 Part 2; L6 Part 1; L7 Part 1; L9 Part 1; L11 Parts 1, 2, 3 **Level 5 M3** L2 Part 1; L3 Part 2; L4 Part 1; L6 Part 2; L11 Part 1; L13 Parts 1, 2, 3 **Level 5 M4** L2 Part 2; L10 Part 1; L13 Part 1; L14 Parts 1, 2, 3
Structure and Function	**Level 5 M3** L12 Parts 2, 4, 5
Stability and Change	**Level 5 M1** L10 Parts 1, 2, 4; L11 Part 3 **Level 5 M3** L10 Part 1