HILLSBOROUGH TOWNSHIP SCHOOL DISTRICT

SCIENCE CURRICULUM

GRADE 3

AUGUST 2021

Grade 3
Science Course Overview

Children are natural scientists that actively wonder about the phenomena in the world around them. The third grade science curriculum of Hillsborough Township Public Schools aims to educate students in the areas of Physical Sciences, Life Sciences, as well as Earth and Space Sciences by building on their elementary experiences and helping them make sense of their world. Students further develop their understandings of core ideas which include Forces and Interactions, Interdependent Relationships in Ecosystems, Inheritance and Variation of Traits: Life Cycles and Traits, and Weather and Climate. Given the importance of science and engineering in the 21st century, students require a sense of contextual understanding with regard to scientific knowledge, how it is required and applied, and how science is connected through a series of concepts and help further our understanding of the world around us through design tasks and projects related to their investigations.

Performance expectations thereby focus on understanding and application as opposed to memorization of facts free of context. The performance expectations in third grade help students formulate answers to questions such as: "What is typical weather in different parts of the world and during different times of the year? How can the impact of weather-related hazards be reduced? How do organisms vary in their traits? How are plants, animals, and environments of the past similar or different from current plants, animals, and environments? What happens to organisms when their environment changes? How do equal and unequal forces on an object affect the object? How can magnets be used?"

Students are able to organize and use data to describe typical weather conditions expected during a particular season. By applying their understanding of weather-related hazards, students are able to make a claim about the merit of a design solution that reduces the impacts of such hazards. Students are expected to develop an understanding of the similarities and differences of organisms' life cycles, an understanding that organisms have different inherited traits, and that the environment can also affect the traits that an organism develops. In addition, students are able to construct an explanation using evidence for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. Students are expected to develop an understanding of types of organisms that lived long ago and also about the nature of their environments. Third graders are also expected to develop an understanding of the idea that when the environment changes some organisms survive and reproduce, some move to new locations, some move into the transformed environment, and some die. Additionally, students are able to determine the effects of balanced and unbalanced forces on the motion of an object and the cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other. They are

then able to apply their understanding of magnetic interactions to define a simple design problem that can be solved with magnets.

The crosscutting concepts of patterns, cause and effect, scale, proportion, and quantity, systems and system models, interdependence of science, engineering, and technology, and influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas.

In the third grade performance expectations, students are expected to demonstrate grade-appropriate proficiency in the practices of science and engineering by asking questions and defining problems, developing and using models, planning and carrying out investigations, analyzing and interpreting data, constructing explanations and designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students are expected to use these practices to demonstrate understanding of the core ideas.

The third grade science curriculum meets the requirements of the New Jersey Student Learning Standards for Science. It also helps to prepare students to meet and exceed the standards assessed by the New Jersey State administered assessments through higher order application of various skills required for complete understanding and sensemaking of science phenomena at the third grade level.

Hillsborough Township Public Schools
Grade 3 Science Curriculum

Unit Title	**Time Frame/Pacing**
Physical Science: Forces & Interactions	8 Weeks

Phenomena/Anchoring Activity/Anchoring Question/Essential Questions

Phenomenon:

- Watch: **Ice Boats on Lake Geneva**
- Record observations from the video.
- Explore questions students have from watching the video.

Essential Questions:

- How do we measure length and width?
- What is distance and how do we measure distance?
- How do we measure how long it takes an object to move?
- What is a force and how does it make objects at rest move?
- What can stop an object in motion, or make an object go faster?
- What is the difference between balanced and unbalanced forces?
- How can we create balanced forces that keep an object at rest?
- What are contact and non-contact forces?
- Which forces are non-contact forces?
- What objects are attracted to magnets? How do magnets make things move?
- How do engineers use magnetic force to design a vehicle?

Enduring Understandings

- A push or a pull on an object at rest initiates motion. We call that push or pull a force.
- A force is a push or pull that causes an object to move, change its direction, or slow its movement.
- When an object moves from one position to another, motion takes place.
- An object travels in a straight line unless another force stops the motion or changes its direction.
- The greater the force, the faster an object travels and a heavier object requires a greater force to initiate motion than does a lighter one.
- Balanced forces keep objects at rest will reinforce the idea that unbalanced forces cause motion.
- All forces between objects are the result of four interactions: gravity, electromagnetism, and strong and weak nuclear interactions. These forces are all non-contact forces. When we talk about contact forces we refer to forces where there is direct contact between what is causing the force and the object on which the force is exerted. Any two objects in contact exert forces on each other that are electromagnetic in origin. In order for these forces to be relevant, the distance between the two objects must be very small, and therefore it appears that the objects are actually in contact.

- A magnetic force is a non-contact, invisible force.

NJ Standards/NGSS Performance Expectations Taught and Assessed
Students who demonstrate understanding can:

- 3-PS2-1 Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
- 3-PS2-2 Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.
- 3-PS2-3 Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.
- 3-PS2-4 Define a simple design problem that can be solved by applying scientific ideas about magnets.
- 3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-2 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.
- 3-5-ETS1-3 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.

3-Dimensional Learning Components

Science and Engineering Practices	Disciplinary Core Ideas (DCI)	Crosscutting Concepts
Asking Questions and Defining Problems • Ask questions that can be investigated based on patterns such as cause and effect relationships. (3-PS2-3) • Define a simple problem that can be solved through the development of a new or improved object or tool. (3-PS2-4) • Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3-5-ETS1-1) **Planning and Carrying Out Investigations** • Define a simple problem that can be solved	**PS2.A: Forces and Motion** • Each force acts on one particular object and has both strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object's speed or direction of motion. (Boundary: Qualitative and conceptual, but not quantitative addition of forces are used at this). (3-PS2-1) • The patterns of an object's motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be	**Patterns** • Patterns of change can be used to make predictions. (3-PS2-2) **Cause and Effect** • Cause and effect relationships are routinely identified. (3-PS2-1), (3-PS2-3) **Influence of Science, Engineering, and Technology on Society and the Natural World** • People's needs and wants change over time, as do their demands for new and improved technologies. (3-5-ETS1-1)

through the development of a new or improved object or tool. (3-PS2-1) • Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (3-PS2-2) • Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3-5-ETS1-3) **Constructing Explanations and Designing Solutions** • Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3-5-ETS1-2)	predicted from it. (Boundary: Technical terms, such as magnitude, velocity, momentum, and vector quantity, are not introduced at this level, but the concept that some quantities need both size and direction to be described is developed.) (3-PS2-2) **PS2.B: Types of Interactions** • Objects in contact exert forces on each other. (3-PS2-1) • Electric, and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. (3-PS2-3), (3-PS2-4) **ETS1.A: Defining and Delimiting Engineering Problems** • Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1) **ETS1.B: Developing Possible Solutions** • Research on a problem should be carried out before beginning to design a solution.	**Influence of Science, Engineering, and Technology on Society and the Natural World** • Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands. (3-5-ETS1-2)

	Testing a solution involves investigating how well it performs under a range of likely conditions. • At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2) **ETS1.B: Developing Possible Solutions** • Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. **ETS1.C: Optimizing the Design Solution** • Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3)	

Interdisciplinary Connections: Math, ELA, and Computer Science and Design Thinking

Math

- 3.OA Operations and Algebraic Thinking (3-ETS1-1), (3-ETS1-2)
- 3-5.OA Operations and Algebraic Thinking (3-ETS1-1), (3-ETS1-2)
- MP.2 Reason abstractly and quantitatively. (3-PS2-1), (3-5-ETS1-1), (3-5-ETS1-2), (3-5-ETS1-3)
- MP.4 Model with mathematics. (3-5-ETS1-1), (3-5-ETS1-2), (3-5-ETS1-3)
- MP.5 Use appropriate tools strategically. (3-PS2-1), (3-5-ETS1-1), (3-5-ETS1-2), (3-5-ETS1-3)
- 3.MD.A.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (3-PS2-1)

ELA

- RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-PS2-1), (3-PS2-3)
- RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using

language that pertains to time, sequence, and cause/effect. (3-PS2-3)

- RI.3.8 Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence). (3-PS2-3)
- RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (3-5-ETS1-2)
- RI.5.1 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (3-5-ETS1-2)
- RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (3-5-ETS1-2)
- SL.3.3 Ask and answer questions about information from a speaker, offering appropriate elaboration and detail. (3-PS2-3)
- W.3.7 Conduct short research projects that build knowledge about a topic. (3-PS2-1), (3-PS2-2)
- W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. (3-PS2-1), (3-PS2-2)
- W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. (3-5-ETS1-1), (3-5-ETS1-3)
- W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (3-5-ETS1-1), (3-5-ETS1-3)
- W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (3-5-ETS1-1), (3-5-ETS1-3)

Computer Science and Design Thinking

- 8.1.5.DA.1 Collect, organize, and display data in order to highlight relationships or support a claim.
- 8.1.5.DA.5 Propose cause and effect relationships, predict outcomes, or communicate ideas using data.
- 8.2.5.ED.1 Explain the functions of a system and its subsystems.
- 8.2.5.ED.2 Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
- 8.2.5.ED.3 Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.
- 8.2.5.ED.4 Explain factors that influence the development and function of products and systems (e.g., resources, criteria, desired features, constraints).
- 8.2.5.ED.5 Describe how specifications and limitations impact the engineering design process.
- 8.2.5.ED.6 Evaluate and test alternative solutions to a problem using the constraints and tradeoffs identified in the design process.

Career Readiness, Life Literacies, and Key Skills

- 9.4.5.CI.3 Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a).
- 9.4.5.CI.4 Research the development process of a product and identify the role of failure as a part of the creative process (e.g., W.4.7, 8.2.5.ED.6)
- 9.4.5.CT.1 Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).
- 9.4.5.CT.2 Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem (e.g., 2.1.5.CHSS.1, 4-ESS3-1).

- 9.4.5.CT.3 Describe how digital tools and technology may be used to solve problems.
- 9.4.5.CT.4 Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).

Social-Emotional Learning Competencies

- **Self-Management:**
  - Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals.
- **Responsible Decision-Making:**
  - Develop, implement, and model effective problem-solving and critical thinking skills.
  - Evaluate personal, ethical, safety, and civic impact of decisions.
- **Relationship Skills:**
  - Utilize positive communication and social skills to interact effectively with others.

Learning Targets	Investigations/Resources	Formative Assessment
Compare measurements using standard and non-standard units. Explain why a standard unit is more reliable than a non-standard unit.	• Recall prior knowledge of measurement (KWL). • Provide a list of classroom objects to measure (i.e, desks, textbooks, crayons, etc). Measure various objects using both standard and non-standard measuring tools (i.e-hand, foot, etc.). ○ Record data	Journal Response: What is the difference between standard and nonstandard forms of measurement? Why is it important to use a standard form of measurement?
Explain the importance of initial and final positions when measuring distance traveled. Predict future motion by observing patterns.	• Use a remote control car while their assigned partner(s) help to measure how far the car is from a given point. (Record data) • Use the remote control car while partner helps to measure time with a stopwatch. (Record data)	Exit Slip: Can you think of any reasons why a scientist might want to know how far something went and which way it traveled? Why is that important to know?
Explain that a push or pull causes an object at rest to move or cause a moving object to stop or change position. Explore why it requires more force to move a	• Push a ping pong ball (using wind as a source- i.e- straw, syringe, etc.) from a starting point, turn around a cone, and come back to the finish line. Students will	Check for Understanding (class discussion): If an object is moving, how can you change its direction of motion? Does it take more or less force to move a more massive object?

heavier object than a lighter one.	observe the path of their ping-pong ball. (Record data) • Push an empty cup (using wind as a source- i.e- straw, syringe, etc.). Repeat the activity with a rubber ball in the cup and a metal ball in the cup. (Record the distance each cup traveled).	Exit Slip: When you are shopping in a supermarket, does it take more effort to push or pull an empty cart, or one filled with groceries? Why?
Explain that if an object is at rest, two equal forces in opposite directions will cause the object to stay at rest. Examine why when two forces are applied to an object, motion results if the forces are not equal, or if they are not applied in opposite directions.	• Explore balanced and unbalanced forces by having students participate in tug-of-war activity. • Tug-of-war cone activity: ○ Using a cone and ring with four ropes attached, students will explore balanced and unbalanced forces when more than two forces are being applied.	Activity: Students work in pairs or small groups to create an activity which demonstrates that an object will remain at rest if two equal forces from opposite directions are exerted upon it (ie. use objects from the classroom or their own bodies to create a balanced force). Exit Slip: Do balanced forces cause motion? How do you know?

Demonstrate that a magnetic force is a non-contact force.
Explore and classify various forces as contact and non-contact forces.
	• Use the Newton's Cradle to observe what happens when the first sphere hits the row of other spheres. Repeat process with two external spheres, three external spheres, etc. (Record observations).
	• Explore contact and non-contact forces by having one student drop a textbook and piece of paper at the same time (Share observations).
	• Distribute a pair of magnets, a silk pad, a rod, and a styrofoam peanut to students.
	  ○ Rub the silk pad on the rod for about 20 seconds and turn on faucet.
	  ○ Move the rod close to the stream of water without touching the water (Share observations).
	• Inclined Plane Activity:
		Check for Understanding (class discussion): What causes the Newton's cradle to move? Why did the sheet of paper and the book move? What pulled them down?
		
		Journal Entry: Share examples of contact and non-contact forces in the world around us. What is the difference between contact and non-contact forces?

	○ Students will demonstrate that to prevent the cart from sliding, you use less force than the weight of the cart itself.	
Explain what kinds of materials magnets attract. Explore how the like poles of two magnets repel each other and the opposite poles of two magnets attract each other. Demonstrate how magnetic forces can pass through some non-magnetic materials.	• Magnet Exploration Activity: ○ Investigate what kinds of objects are attracted by magnets. • Maglev Train: ○ Students will be asked to read about magnetic levitation and to decide on the proper configuration of magnets to make the train levitate.	Check for Understanding (class discussion): What types of objects were attracted to magnets? Why do you think that is? Activity: Divide class into partners or small groups. Provide magnets without the poles labeled. Ask: how can you determine what the poles' labels should be?

Instructional Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate

- Read articles and/or directions to students to help with comprehension
- Teacher provided scaffolding for designing investigations, one-on-one or in small groups
- Provide access to anchor charts and classroom labels relevant to science concepts
- Scribe for students or allow students to use talk-to-text feature on Chromebooks when responding to questions
- Provide access to articles and books further exploring the topic of study
- Any other modification as per student IEP or 504 plan

Common Assessment(s)	**Assessment Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate**
• Forces & Interactions Common Assessment: Forces & Interactions CA	• Provide verbal directions to assessment questions. • Scribe for students or allow typing / talk to text feature to assist in recording responses.

Hillsborough Township Public Schools
Grade 3 Science Curriculum

Unit Title	**Time Frame/Pacing**
Earth and Space Science: Weather and Climate	12 Weeks

Phenomena/Anchoring Activity/Anchoring Question/Essential Questions

Phenomena Lesson:

- A tornado's path of destruction
    - Joplin Tornado

Essential Questions:

- What is weather?
    - What are the "ingredients" of weather?
    - How is the weather measured?
    - How can we create working models of weather instruments?
    - How does the water cycle affect weather?
    - What role do clouds play in weather?
    - How do meteorologists forecast the weather?
    - What data have we gathered about our local weather?
- What is climate?
    - Where are Earth's biomes?
- What is extreme weather?
    - What are tornadoes?
    - What are hurricanes?
    - What are winter storms?

Enduring Understandings

- Weather is the condition of the atmosphere in one particular area for one particular period of time. Weather affects our day-today activities and we know that weather conditions can change from minute to minute in just one area. Different parts of any town, state, and even parts of the country may experience different types of weather at the same time. Scientists record weather patterns in an area over time so they can make predictions about what kind of weather might happen next. This lesson provides opportunities for observation and collection of weather data as well as providing deeper foundational knowledge about the components of weather and how they interact.
- Weather is the condition of the atmosphere in one particular area for one particular period of time. Climate describes an area's typical weather conditions

and the extent to which those conditions vary over time. Earth has three main climate zones. The conditions within each climate zone are directly related to their location (latitude) and the angle and amount of solar energy received. Each climate zone may be further divided into biomes, which are regions with similar climate conditions, plant, and animal life. This lesson provides foundational knowledge about climate and biomes.

- Weather is a combination of several components, each providing its own set of variables for weather conditions. Extreme weather events significantly impact areas where they occur. This lesson provides foundational knowledge about tornadoes, hurricanes, and winter storms in preparation for the engineering design task that follows.
- Students have foundational knowledge about the causes and characteristics of extreme weather (tornadoes, hurricanes, thunderstorms and winter storms). In this lesson students will learn the basics of house construction. "Building" upon that knowledge and previous knowledge of extreme weather, they will design and construct a model house capable of withstanding "hurricane force" winds.

NJ Standards/NGSS Performance Expectations Taught and Assessed
Students who demonstrate understanding can:

- 3-ESS2-1 Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.
- 3-ESS2-2 Obtain and combine information to describe climates in different regions of the world.
- 3-ESS3-1 Make a claim about the merit of a design solution that reduces the impacts of climate change and/or a weather-related hazard.
- 3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-2 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.
- 3-5-ETS1-3 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.

3-Dimensional Learning Components

Science and Engineering Practices	Disciplinary Core Ideas (DCI)	Crosscutting Concepts
Analyzing and Interpreting Data • Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships. (3-ESS2-1) **Obtaining, Evaluating, and Communicating Information** • Obtain and combine information from	**ESS2.D: Weather and Climate** • Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1) **ESS2.D: Weather and Climate** • Climate describes a range of an area's typical weather conditions and the extent to	**Patterns** • Patterns of change can be used to make predictions. (3-ESS2-1), (3-ESS2-2) **Cause and Effect** • Cause and effect relationships are routinely identified, tested, and used to explain change. (3-ESS3-1)

books and other reliable media to explain phenomena. (3-ESS2-2) **Engaging in Argument from Evidence** • Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-ESS3-1) **Asking Questions and Defining Problems** • Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3-5-ETS1-1) **Constructing Explanations and Designing Solutions** • Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3-5-ETS1-2) **Planning and Carrying Out Investigations** • Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3-5-ETS1-3)	which those conditions vary over years. (3-ESS2-2) **ESS3.B: Natural Hazards** • A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3-ESS3-1) **ETS1.A: Defining and Delimiting Engineering Problems** • Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1) **ETS1.B: Developing Possible Solutions** • Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. • At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2) **ETS1.B: Developing Possible Solutions**	**Influence of Science, Engineering, and Technology on Society and the Natural World** • People's needs and wants change over time, as do their demands for new and improved technologies. (3-5-ETS1-1) **Influence of Science, Engineering, and Technology on Society and the Natural World** • Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands. (3-5-ETS1-2)

	• Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. **ETS1.C: Optimizing the Design Solution** • Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3)	

Interdisciplinary Connections: Math, ELA, and Computer Science and Design Thinking

Math

- MP.2 Reason abstractly and quantitatively. (3-ESS2-1), (3- ESS2-2), (3-ESS3-1), (3-5-ETS1-1), (3-5-ETS1-2), (3-5-ETS1-3)
- MP.4 Model with mathematics. (3- ESS2-1), (3-ESS2-2), (3-ESS3-1), (3-5-ETS1-1), (3-5-ETS1-2), (3-5-ETS1-3)
- MP.5 Use appropriate tools strategically. (3-ESS2-1), (3-5-ETS1-1), (3-5-ETS1-2), (3-5-ETS1-3)
- 3-5.OA Operations and Algebraic Thinking (3-ETS1-1), (3-5-ETS1-2)
- 3.MD.A.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (3- ESS2-1)
- 3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two step "how many more" and "how many less" problems using information presented in bar graphs. (3-ESS2-1)

ELA

- RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3- ESS2-2)
- RI.3.9 Compare and contrast the most important points and key details presented in two texts on the same topic. (3-ESS2-2)
- RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (3-5-ETS1-2)
- RI.5.1 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (3-5-ETS1-2)
- RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (3-5-ETS1-2)
- W.3.1 Write opinion pieces on topics or texts, supporting a point of view with reasons. (3-ESS3-1)
- W.3.7 Conduct short research projects that build knowledge about a topic. (3-ESS3-1)
- W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into prov
- W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. (3-5-ETS1-1) (3-5-ETS1-3)

- W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (3-5-ETS1-1), (3-5-ETS1-3)
- W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (3-5-ETS1-1), (3-5-ETS1-3)

Computer Science and Design Thinking

- 8.1.2.DA.1 Collect and present data, including climate change data, in various visual formats.
- 8.1.2.DA.4 Make predictions based on data using charts or graphs.
- 8.1.2.AP.4 Break down a task into a sequence of steps.
- 8.2.2.ED.3 Select and use appropriate tools and materials to build a product using the design process.
- 8.2.2.NT.2 Brainstorm how to build a product, improve a designed product, fix a product that has stopped working, or solve a simple problem.

Career Readiness, Life Literacies, and Key Skills

- 9.4.12.GCA.1 Collaborate with individuals to analyze a variety of potential solutions to climate change effects and determine why some solutions (e.g., political. economic, cultural) may work better than others (e.g., SL.11-12.1., HS-ETS1-1, HS-ETS1-2, HS-ETS1-4, 6.3.12.GeoGI.1, 7.1.IH.IPERS.6, 7.1.IL.IPERS.7, 8.2.12.ETW.3).
- 9.4.12.IML.7 Develop an argument to support a claim regarding a current workplace or societal/ethical issue such as climate change (e.g., NJSLSA.W1, 7.1.AL.PRSNT.4).

Social-Emotional Learning Competencies

- **Responsible Decision-Making:** Develop, implement, and model effective problem-solving and critical thinking skills.
- **Relationship Skills:** Establish and maintain healthy relationships.
- **Relationship Skills:** Utilize positive communication and social skills to interact effectively with others.

Learning Targets	Investigations/Resources	Formative Assessment
Explore phenomena of weather and climate.	Students explore various articles and video resources in order to conclude the difference between weather and climate.	Check for understanding: turn and talk with a partner to redefine both weather and climate.
Record patterns of the weather across different times and areas so that they can make. predictions about what kind of weather might happen next.	Students track weather patterns in a Weather Journal and record daily temperature, precipitation and cloud formations. Students complete a "Weather in a Bag" investigation and record observations in their journal.	Journal entry: What patterns do we see in this week's weather? Why do you think we are observing these changes or consistencies?

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Describe the climate of an area's typical weather conditions and the extent to which those conditions vary over the years.	Students research the earth's biomes. Students discover the differences between tropical, temperate and polar biomes.	Biome Project: Students create a brochure, or slide presentation to reflect their understanding of a certain biome.
Analyze a variety of natural hazards resulting from natural processes.	Students construct hurricane houses to gather understanding of the impact of severe weather storms.	Hurricane House Destruction Day: Teachers and students use a leaf blower to try to destroy the hurricane house. Students observe the process, then reflect in their journals. What parts of my design worked? What parts did not? What would we do differently going forward?

Instructional Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate

- Read articles and/or directions to students to help with comprehension
- Teacher provided scaffolding for designing investigations, one-on-one or in small groups
- Provide access to anchor charts and classroom labels relevant to science concepts
- Scribe for students or allow students to use talk-to-text feature on Chromebooks when responding to questions
- Provide access to articles and books further exploring the topic of study
- Any other modification as per student IEP or 504 plan

Common Assessment(s)	**Assessment Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate**
• **Hurricane House Reflections** • **Rubrics**	• Provide verbal directions to assessment questions. • Scribe for students or allow typing / talk to text feature to assist in recording responses.

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Unit Title	**Time Frame/Pacing**
Life Science: Life Cycles & Traits	16 Weeks

Phenomena/Anchoring Activity/Anchoring Question/Essential Questions

Phenomena

- Life Cycles Phenomenon
  - Video Link - Time lapse of a dandelion life cycle
- Animal Traits Phenomenon
  - Video Link - Peacock feathers and mating dance

Essential Questions

- How are plant life cycles similar?
- How are animal life cycles alike and different?
- How can we compare plant life cycles?
- How do plants spread their seeds?
- How do plants spread their seeds?
- What are other ways to make new plants?
- How do we prepare for the arrival of the frogs?
- How can we learn about our own inherited traits?
- How do plants inherit traits?
- How do humans learn from nature?
- How does trait variation help plants and animals survive?
- How can we learn about how traits change over time?
- Why do animals form groups?
- How do animals communicate by smell?
- How do animals communicate with sound?
- How do animals communicate by sight
- How are fossils formed?
- Where are fossils found?
- What does the location of specific kinds of fossils tell us about Earth's history before human beings were on Earth?

Enduring Understandings

- Plants and animals have predictable characteristics at different stages of development. These stages include birth (animals) or germination (plants);

growth and development; development into an adult or mature stage; reproduction; and death. The purpose of this introductory lesson is for students to identify and sequence general life cycle stages common to plants and animals.

- Plants and animals have predictable characteristics at different stages of development, including birth (animals) or germination (plants); growth and development; developing into an adult or mature stage; reproduction; and death. The purpose of this lesson is for students to explore and compare the life cycles of common plants and the various means by which plants reproduce.
- Reproduction is essential to the continued existence of any kind of animal or plant. Without successful reproduction a plant or animal will become extinct. All animals have life cycles that follow a predictable pattern which includes: birth, growth, reproduction and death. Each life cycle stage has its own predictable characteristics of development. Animals are generally born in one of two ways: live birth and eggs. Some animals are born resembling their parents and some animals go through life cycle stages which include metamorphosis. The purpose of this lesson is for students to understand the frog life cycle and the unique characteristics of each stage.
- Many characteristics of organisms are inherited from their parents. These characteristics, or traits, include physical structures and behaviors. Other traits are learned or acquired and are the result of the organism's interactions with its habitat. Within organisms of the same species there are variations or slight differences. This is possible even with offspring of the same parents. Sometimes these variations give an organism an advantage in meeting its basic needs for survival and adapting to changes in its habitat. Scientists study fossils to learn about animals from the past that did not survive. The purpose of this lesson is for students to understand various types of traits and how variation in traits may affect an organism's chances for survival.
- Being part of a group helps animals meet their basic needs for survival: food and water, shelter, protection from predators, and changes in their habitat. Animals form groups for many different reasons. These groups vary greatly in terms of size and structure. Some groups are stable and exist long term, while others are fluid, with members constantly moving in and out. Some groups have specific roles for their members while members of other groups share equally in tasks necessary for the group's survival. Communication between group members is essential for survival. Group members communicate in a variety of ways, primarily using their senses. The purpose of this lesson is for students to understand the various types of animal groups and how each type of group increases its members' chances for survival.
- Organisms lived long ago before human beings lived on the Earth. Students will learn what fossils are, how fossils develop, and what fossils tell us about prehistoric organisms and their environment.

NJ Standards/NGSS Performance Expectations Taught and Assessed
Students who demonstrate understanding can:

- 3-LS1-1 Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.
- 3-LS2-1 Construct an argument that some animals form groups that help members survive.
- 3-LS3-1 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.
- 3-LS3-2 Use evidence to support the explanation that traits can be influenced by the environment.
- 3-LS4-2 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.
- 3-LS4-1 Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.

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- 3-LS4-3 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.
- 3-LS4-4 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.

3-Dimensional Learning Components

Science and Engineering Practices	Disciplinary Core Ideas (DCI)	Crosscutting Concepts

Developing and Using Models
• Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.
  ○ Develop models to describe phenomena. (3-LS1-1)
 	
Analyzing and Interpreting Data
• Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.
  ○ Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS3-1)
 	
Constructing Explanations and Designing Solutions
• Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict
	LS1.B: Growth and Development of Organisms
	• Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)
	
	LS3.A: Inheritance of Traits
	• Many characteristics of organisms are inherited from their parents. (3-LS3-1)
	• Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2)
	
	LS3.B: Variation of Traits
	• Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1)
	• The environment also affects the traits that an organism develops. (3-LS3-2)
	
	LS4.B: Natural Selection
	• Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding
		Patterns
		• Patterns of change can be used to make predictions. (3-LS1-1)
		• Similarities and differences in patterns can be used to sort and classify natural phenomena. (3-LS3-1)
		
		Cause and Effect
		• Cause and effect relationships are routinely identified and used to explain change. (3-LS3-2), (3-LS4-2) (3-LS2-1), (3-LS4-3)
		
		Scale, Proportion, and Quantity
		• Observable phenomena exist from very short to very long time periods. (3-LS4-1)
		
		Systems and System Models
		• A system can be described in terms of its components and their interactions. (3-LS4-4)

phenomena and in designing multiple solutions to design problems. ○ Use evidence (e.g., observations, patterns) to support an explanation. (3-LS3-2) ○ Use evidence (e.g., observations, patterns) to construct an explanation. (3-LS4-2) **Engaging in Argument from Evidence** • Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). ○ Construct an argument with evidence, data, and/or a model. (3-LS2-1) ○ Construct an argument with evidence. (3-LS4-3) ○ Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-LS4-4)	mates, and reproducing. (3-LS4-2) **LS2.D: Social Interactions and Group Behavior** • Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size. (3-LS2-1) **LS4.A: Evidence of Common Ancestry and Diversity** • Some kinds of plants and animals that once lived on Earth are no longer found anywhere. • Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. (3-LS4-1) **LS4.C: Adaptation** • For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3) **LS2.C: Ecosystem Dynamics, Functioning, and Resilience** • When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. (secondary)	

	LS4.D: Biodiversity and Humans • Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)	

Interdisciplinary Connections: Math, ELA, and Computer Science and Design Thinking

Math

- 3.NBT Number and Operations in Base Ten (3-LS1-1)
- 3.NF Number and Operations—Fractions (3-LS1-1)
- 3.NBT Number and Operations in Base Ten. (3-LS2-1)
- MP.2 Reason abstractly and quantitatively. (3-LS3-1), (3-LS3-2), (3-LS4-1), (3-LS4-2), (3-LS4-3), (3-LS4-4)
- MP.4 Model with mathematics. (3-LS1-1), (3-LS2-1), (3-LS3-1), (3-LS3-2), (3-LS4-1), (3-LS4-2), (3-LS4-4)
- MP.5 Use appropriate tools strategically. (3-LS4-1)
- 3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. (3-LS4-2), (3-LS4-3)
- 3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. (3-LS3-1), (3-LS3-2), (3-LS4-1)

ELA

- RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-LS2-1), (3-LS3-1), (3-LS3-2), (3-LS4-1), (3-LS4-2), (3-LS4-3), (3-LS4-4)
- RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea. (3-LS3-1), (3-LS3-2), (3-LS4-1), (3-LS4-2), (3-LS4-3), (3-LS4-4)
- RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. (3-LS2-1), (3-LS3-1), (3-LS3-2), (3-LS4-1), (3-LS4-2), (3-LS4-3), (3-LS4-4)
- RI.3.7 Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur). (3-LS1-1)
- W.3.1 Write opinion pieces on topics or texts, supporting a point of view with reasons. (3-LS2-1), (3-LS4-1), (3-LS4-3), (3-LS4-4)
- W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS4-1), (3-LS4-2), (3-LS4-3), (3-LS4-4)
- W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. (3-LS4-1)
- SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace. (3-LS3-1), (3-LS3-2), (3-LS4-2), (3-LS4-3), (3-LS4-4)
- SL.3.5 Create engaging audio recordings of stories or poems that demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details. (3-LS1-1)

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Computer Science and Design Thinking

- 8.1.5.DA.1 Collect, organize, and display data in order to highlight relationships or support a claim.
- 8.1.5.DA.3 Organize and present collected data visually to communicate insights gained from different views of the data.
- 8.1.5.DA.5 Propose cause and effect relationships, predict outcomes, or communicate ideas using data.
- 8.2.5.ED.2 Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.

Career Readiness, Life Literacies, and Key Skills

- 9.4.5.CI.3 Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a).
- 9.4.5.CT.1 Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).
- 9.4.5.CT.4 Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).

Social-Emotional Learning Competencies

- **Responsible Decision-Making:** Develop, implement, and model effective problem-solving and critical thinking skills.
- **Relationship Skills:** Establish and maintain healthy relationships.
- **Relationship Skills:** Utilize positive communication and social skills to interact effectively with others.

Learning Targets	Investigations/Resources	Formative Assessment
Introduction to Life Cycles (1Week) • Identify and sequence life cycles stages common to flowering plants and trees. • Identify and sequence general animal life cycle stages. • Explain the difference between each stage of a specific animal/plant's life cycle by comparing offspring to parent. • Identify the stages of the human life cycle and the current stage of the student.	Introduction to Life Cycles • Listen to *The Very Hungry Caterpillar* as a scientist and identify the stages of life that the caterpillar goes through. • Read about animal and plant life cycles, discuss the different stages of each, and chart observations. • Share a chart of the human life cycle and discuss observations of each stage. Partner students to discuss how they have grown and changed throughout their lives and chart their changes in a journal.	Introduction to Life Cycles • Journal Entry: Project the same human life cycle chart and various other animal and plant life cycles of choice. Have students select one and compare the stages to a human life cycle.

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Plant Life Cycles (2 Weeks)
★ *Can flip lessons with Animal Life Cycle lessons, depending on when Frogs Arrive.*
 	
• Identify the changes in a plant's life cycle which includes sprouting; developing roots, stems, leaves, and flowers; reproducing; and eventually dying.
• Describe the different ways a plant can reproduce and start their life cycle.
	Plant Life Cycles
	• Show a flowering potted plant and identify parts of the plant and determine what part of the plant develops into the fruit/flower.
	• Video: Time Lapse of a Sunflower (From Seed to Flower)
	• Hand out seeds for students to open and make observations. Draw and chart parts of a plant in Journal.
	• Plant one of the seeds: See first Formative Assessment for ongoing activities surrounding this planting activity.
	• Ask students to listen to *The Tiny Seed* and have them make observations on seed dispersal.
	  ○ Optional Activity: Show video of a Spitting Cucumber or video. Exploding Seeds as a form of speed dispersal.
	• Interactive Activity: Prep Needed - Hand out a variety of different seeds for students to make observations with. Make Helicopter Seeds out of paper.
	  ○ Optional Activity: Go for a nature walk and see if students can collect any seeds.
	• Plant Propagation: Ask: All plants do not grow from seeds, what are other ways to form new plants? (bulbs, runners or cutting)
	• Observe the cross section of an onion bulb and identify its parts. Show different examples of bulbs, runners and cutting.
		Plant Life Cycles
		• (Ongoing Assessment) Plant Life Cycle Observation Journal Entry: After planting seeds, make daily observations and determine what stage the plant is currently in.
		  ○ Students can write observations using content specific vocabulary.
		  ○ Students can draw pictures of their observations to match.
		• Students evaluate their journal and create a poster presentation to show the four basic stages of a green plant's life cycle (seed germination, seedling, mature plant, fruit, and seed).

Animal Life Cycles (2 Weeks) • Identify, describe, and sequence life cycles stages common to most frogs.	Animal Life Cycles • KWL chart on frogs, toads, and amphibians and then read about them to avoid any	Animal Life Cycles • (Ongoing Assessment) Frog Life Cycle Observation Journal Entry: Make daily

• Conduct investigations which relate to frog life cycle stages. • Make and record accurate observations, comparisons, and differences regarding the growth of tadpoles and froglets.	misconceptions. • Compare and Contrast Frogs and Toads. Watch a video on their differences. • Present a chart of a frog's life cycle and make observations. Read about it and watch this video. • Egg Observation: Show a diagram of frog eggs and have students look at the real frog eggs to match what they see and what they read about. Discuss observations. • Make a model of how a frog turns into a froglet using cardstock and fasteners to support gained knowledge. Label it's parts. • Select an animal of choice, research that animal, and create a diagram, with labels describing each stage, of that animal's life cycle. ○ Optional Activity: Watch a video of time lapse of animals compared to frogs.	observations and determine what stage the frog is currently in. ○ Students can write observations using content specific vocabulary. ○ Students can draw pictures of their observations to match. • Nearpod quiz • Journal Entry: Compare and contrast the researched animal to the frog's life cycle. • Optional: Combination of Plant and Animal Life Cycle Unit Lessons: Journal Entry - Compare and contrast plant and animal life cycles.
Nature or Nurture - Traits in Animals and Plants (2 Weeks) • Differentiate among inherited, learned, and acquired traits. • Identify physical and behavioral traits that are passed from parent to offspring. • Conduct a structured inquiry survey about inherited human traits. • Explore how nature has influenced human learning and technology. • Explain the role of trait variation in the survival of plants and animals.	Nature or Nurture - Traits in Animals and Plants • Discuss with partners everything they know about dogs (do not prompt students-students are to list what they know about dogs). ○ Then identify if the listed characteristics are learned behavior, acquired or inherited traits. ○ Read about learned traits (behavior), acquired and inherited traits or watch video: Inherited Trait vs Learned Trait/Behavior and Acquired Trait. ○ Sort and identify traits under the correct heading.	Nature or Nurture - Traits in Animals and Plants • Selective Breeding: Humans use selective breeding with animals to help choose a pet. ○ Brainstorm different breeds of dogs and break students into partners or this can be done alone to choose and research a certain breed. ○ Use different resources to do research. Dog Breeds Website Designer Dog Slideshow ○ Use the graphic organizer to take notes on physical traits and behaviors that are special to the breed; the main job

	• Invite students to cross their hands with fingers interlaced and record the # of students whose right thumb is on top and those whose left thumb is on top.
	  ○ Identify other inherited traits and chart them.
	  ○ Optional Activity: Survey other students or family members to gather information about inherited traits.
	• Question whether plants inherit traits and chart traits that plants inherit from their parents.
	  ○ Optional Activity: Draw or create a hybrid plant and explain the trait variations.
	• Identify ways humans learn from nature (example Velcro was inspired by how burdocks stuck to clothing) Prompt students to think of animals with unique adaptations such as bats, dolphins, armadillos or flying squirrels).
	• Identify traits that are needed for survival (giraffe, grasshoppers and dinosaurs).
	  ○ Read and discuss how there are slight variations of traits that are adapted to meet certain basic needs.
	• Explore how scientists learn about how traits change over time.
	  ○ Examine different pictures of fossils or a fossil set and make observations. (Chart what they can determine about the animal based on their observations).
		or purpose of the breed; and some "fabulous facts".
		  ○ Includes all of the details in a written report, a typed report, a slideshow, a poster, or another kind of report.
		  ○ Present project.

Animal Communities (2 Weeks) • Differentiate between types of animal	Animal Communities • Watch Animal Communities or Amazing	Animal Communities

groups and the purposes of each.
• Associate specific animals with each type of group.
• Explain how different senses are used for communication between group members.
	Animal Groups.
	• Discuss and chart the purpose of a family (provide basic needs) and group.
	• Read about family animal groups (families, colonies, schools and migrating groups) and record how they help meet basic needs.
	• Explore ways that animals communicate (smell, sound, sight) Sid the Kid Scientist Hello Doggie (you will need to scroll through) or Animal Communication.
	  ○ Smelly Signals (Find "family members" using only your sense of smell.). PRE-SOAK cotton swabs in extracts. Give swabs to each student and then have them wave the cotton swab in the air as they pass by other students. Use a sense of smell to locate the other members of a family with the same scent (students that have cotton swabs with the same scent as yours).
	  ○ Bird Calls- listen to various bird calls and hold up bird pictures that match sound or make up a bird call using different patterns and find other birds in your group that are making the same sound.
	  ○ Follow the Leader (Copycat Game) Sit or stand in a circle. Choose one person to be the "guesser" and have that person leave the room. Choose someone else to be the "leader." The rest of the group will copy the movements that the leader makes. Movements might include hand claps, pats, dances, or head motions. Be creative! Whenever the leader changes
		• Journal Entry: List different kinds of animal groups and how do animal groups help meet the needs of their members?
		• Provide a list of animals and identify ways they communicate.

	movements, everyone else should change their movements, too. The "guesser" can come back into the room, and they have three chances to pick out the leader.	

Fossils Tell Stories of Prehistoric Life on Earth (2 Weeks)
• Explain what a fossil is.
• Describe how fossils are formed.
• Develop an argument from evidence that Earth's environments/organisms have changed over millions of years.
	Fossils Tell Stories of Prehistoric Life on Earth
	• How do we know what dinosaurs looked like?
	• Show pictures of fossils and define the meaning of extinction. Students will write their observations in their journals from fossil examples.
	• Read about how fossils are formed and where they are found. Watch this video.
	• Create fossils using clay and shell imprints and examine them after a day of harding.
	• Show pictures of footprints/tracing and have students try to determine the animal it is associated with. Make the connection to a Paleontologist.
	  ○ Video: Job of a Paleontologist
	  ○ Have students trace an item at home as their "footprint" and have students guess what the item is.
	  ○ Optional Activity:Examine dinosaur footprints and calculate what dinosaur they would race.
	• Demonstrate how to use a Geological Time Scale.
		Fossils Tell Stories of Prehistoric Life on Earth
		• Show students images of fossils and have them sort the fossils into the correct category; Body Fossil or Trace Fossil.
		  ○ Differentiate by creating a third category of "Non-fossils" and incorporate images that are not fossils.
		• Have students sort images, sequencing the correct order of how fossils are formed.
		• Show students a collection of a variety of fossils, casts, and molds and ask them to match each item to a time period on the Geologic Time Scale.

Instructional Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate		
• Read articles and/or directions to students to help with comprehension • Teacher provided scaffolding for designing investigations, one-on-one or in small groups • Provide access to anchor charts and classroom labels relevant to science concepts		

• Scribe for students or allow students to use talk-to-text feature on Chromebooks when responding to questions • Provide access to articles and books further exploring the topic of study • Any other modification as per student IEP or 504 plan	
Common Assessment(s)	**Assessment Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate**
• Unit 3 Common Assessment • Unit 3 Rubric	• When appropriate, provide verbal directions to assessment questions. • When appropriate, scribe for students or allow typing / talk to text features to assist in recording responses.