

**CURRICULUM**

**FOR  
SCIENCE**

**GRADE 3**

This curriculum is part of the Educational Program of Studies of the Rahway Public Schools.

### **ACKNOWLEDGMENTS**

**Dr. Susan Dube, Program Supervisor of Science & Technology Education**

The Board acknowledges the following who contributed to the preparation of this curriculum.

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Subject/Course Title:  
**Science**  
**Grade 3**

Date of Board Adoption:  
**September 19, 2023**

# RAHWAY PUBLIC SCHOOLS CURRICULUM

Science: Grade 3

## *PACING GUIDE*

<b>Unit</b>	<b>Title</b>	<b>Pacing</b>
1	Earth's Systems: Weather & Climate; Earth & Human Activity: Natural Hazards	15 weeks
2	Motion and Matter	10 weeks
3	Structures of Life	15 weeks

## *ACCOMMODATIONS*

<p><b>504 Accommodations:</b></p> <ul style="list-style-type: none"> <li>● Provide scaffolded vocabulary and vocabulary lists.</li> <li>● Provide extra visual and verbal cues and prompts.</li> <li>● Provide adapted/alternate/excerpted versions of the text and/or modified supplementary materials.</li> <li>● Provide links to audio files and utilize video clips.</li> <li>● Provide graphic organizers and/or checklists.</li> <li>● Provide modified rubrics.</li> <li>● Provide a copy of teaching notes, especially any key terms, in advance.</li> <li>● Allow additional time to complete assignments and/or assessments.</li> <li>● Provide shorter writing assignments.</li> <li>● Provide sentence starters.</li> <li>● Utilize small group instruction.</li> <li>● Utilize Think-Pair-Share structure.</li> <li>● Check for understanding frequently.</li> <li>● Have student restate information.</li> <li>● Support auditory presentations with visuals.</li> <li>● Weekly home-school communication tools (notebook, daily log, phone calls or email messages).</li> <li>● Provide study sheets and teacher outlines prior to assessments.</li> <li>● Quiet corner or room to calm down and relax when anxious.</li> <li>● Reduction of distractions.</li> <li>● Permit answers to be dictated.</li> <li>● Hands-on activities.</li> <li>● Use of manipulatives.</li> <li>● Assign preferential seating.</li> <li>● No penalty for spelling errors or sloppy handwriting.</li> <li>● Follow a routine/schedule.</li> <li>● Provide student with rest breaks.</li> <li>● Use verbal and visual cues regarding directions and staying on task.</li> <li>● Assist in maintaining agenda book.</li> </ul>	<p><b>IEP Accommodations:</b></p> <ul style="list-style-type: none"> <li>● Provide scaffolded vocabulary and vocabulary lists.</li> <li>● Differentiate reading levels of texts (e.g., Newsela).</li> <li>● Provide adapted/alternate/excerpted versions of the text and/or modified supplementary materials.</li> <li>● Provide extra visual and verbal cues and prompts.</li> <li>● Provide links to audio files and utilize video clips.</li> <li>● Provide graphic organizers and/or checklists.</li> <li>● Provide modified rubrics.</li> <li>● Provide a copy of teaching notes, especially any key terms, in advance.</li> <li>● Provide students with additional information to supplement notes.</li> <li>● Modify questioning techniques and provide a reduced number of questions or items on tests.</li> <li>● Allow additional time to complete assignments and/or assessments.</li> <li>● Provide shorter writing assignments.</li> <li>● Provide sentence starters.</li> <li>● Utilize small group instruction.</li> <li>● Utilize Think-Pair-Share structure.</li> <li>● Check for understanding frequently.</li> <li>● Have student restate information.</li> <li>● Support auditory presentations with visuals.</li> <li>● Provide study sheets and teacher outlines prior to assessments.</li> <li>● Use of manipulatives.</li> <li>● Have students work with partners or in groups for reading, presentations, assignments, and analyses.</li> <li>● Assign appropriate roles in collaborative work.</li> <li>● Assign preferential seating.</li> <li>● Follow a routine/schedule.</li> </ul>
<p><b>Gifted and Talented Accommodations:</b></p> <ul style="list-style-type: none"> <li>● Differentiate reading levels of texts (e.g., Newsela).</li> <li>● Offer students additional texts with higher lexile levels.</li> <li>● Provide more challenging and/or more supplemental readings and/or activities to deepen understanding.</li> <li>● Allow for independent reading, research, and projects.</li> <li>● Accelerate or compact the curriculum.</li> <li>● Offer higher-level thinking questions for deeper analysis.</li> <li>● Offer more rigorous materials/tasks/prompts.</li> <li>● Increase number and complexity of sources.</li> <li>● Assign group research and presentations to teach the class.</li> <li>● Assign/allow for leadership roles during collaborative work and in other learning activities.</li> </ul>	<p><b>ML Accommodations:</b></p> <ul style="list-style-type: none"> <li>● Provide extended time.</li> <li>● Assign preferential seating.</li> <li>● Assign peer buddy who the student can work with.</li> <li>● Check for understanding frequently.</li> <li>● Provide language feedback often (such as grammar errors, tenses, subject-verb agreements, etc...).</li> <li>● Have student repeat directions.</li> <li>● Make vocabulary words available during classwork and exams.</li> <li>● Use study guides/checklists to organize information.</li> <li>● Repeat directions.</li> <li>● Increase one-on-one conferencing.</li> <li>● Allow student to listen to an audio version of the text.</li> <li>● Give directions in small, distinct steps.</li> <li>● Allow copying from paper/book.</li> <li>● Give student a copy of the class notes.</li> </ul>

- Provide written and oral instructions.
- Differentiate reading levels of texts (e.g., Newsela).
- Shorten assignments.
- Read directions aloud to student.
- Give oral clues or prompts.
- Record or type assignments.
- Adapt worksheets/packets.
- Create alternate assignments.
- Have student enter written assignments in criterion, where they can use the planning maps to help get them started and receive feedback after it is submitted.
- Allow student to resubmit assignments.
- Use small group instruction.
- Simplify language.
- Provide scaffolded vocabulary and vocabulary lists.
- Demonstrate concepts possibly through the use of visuals.
- Use manipulatives.
- Emphasize critical information by highlighting it for the student.
- Use graphic organizers.
- Pre-teach or pre-view vocabulary.
- Provide student with a list of prompts or sentence starters that they can use when completing a written assignment.
- Provide audio versions of the textbooks.
- Highlight textbooks/study guides.
- Use supplementary materials.
- Give assistance in note taking
- Use adapted/modified textbooks.
- Allow use of computer/word processor.
- Allow student to answer orally, give extended time (time-and-a-half).
- Allow tests to be given in a separate location (with the ESL teacher).
- Allow additional time to complete assignments and/or assessments.
- Read question to student to clarify.
- Provide a definition or synonym for words on a test that do not impact the validity of the exam.
- Modify the format of assessments.
- Shorten test length or require only selected test items.
- Create alternative assessments.
- On an exam other than a spelling test, don't take points off for spelling errors.

## UNIT OVERVIEW

**Unit Title:** Earth's Systems & Earth & Human Activity

**Target Course/Grade Level:** Grade 3

**Unit Summary:** The Earth Science unit is designed to help third-grade students understand the concepts of weather patterns, climates in different regions of the world, and the impact of weather-related hazards. Throughout this unit, students will develop skills in data representation, analysis, and critical thinking as they explore typical weather conditions, climate variations, and potential design solutions for weather-related hazards.

**Approximate Length of Unit:** About 15 Weeks

## LEARNING TARGETS

### NJ Student Learning Standards:

#### Science:

- 3-ESS2-1. Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. *Examples of data could include average temperature, precipitation, and wind direction.*
  - **DCI:** 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)
- 3-ESS2-2. Obtain and combine information to describe climates in different regions of the world.
  - **DCI:** Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3- ESS2-2)
- 3-ESS3-1. Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard. *Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind resistant roofs, and lightning rods.*
  - **DCI:** 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)

### Career Readiness, Life Literacies, and Key Skills:

- **9.4.2.CI.1:** Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1,6.1.2.CivicsCM.2).
- **9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
- **9.4.2.CT.2:** Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
- **9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
- **9.4.2.DC.1:** Explain the differences between ownership and sharing of information.
- **9.4.2.DC.2:** Explain the importance of respecting the digital content of others.

- **9.4.2.IML.3:** Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults (e.g., 6.3.2.GeoGI.2, 6.1.2.HistorySE.3, W.2.6, 1-LSI-2).
- **9.4.2.IML.4:** Compare and contrast the way information is shared in a variety of contexts (e.g., social, academic, athletic) (e.g., 2.2.2.MSC.5, RL.2.9).
- **9.4.2.IML.4:** Compare and contrast the way information is shared in a variety of contexts (e.g., social, academic, athletic) (e.g., 2.2.2.MSC.5, RL.2.9).

#### **Technology:**

- **8.1.5.A.1** Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
- **8.1.5.D.3** Demonstrate an understanding of the need to practice cyber safety, cyber security, and cyber ethics when using technologies and social media.
- **8.1.5.D.4** Understand digital citizenship and demonstrate an understanding of the personal consequences of inappropriate use of technology and social media.

#### **Interdisciplinary Connections and Standards:**

##### **ELA/Literacy**

- **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)
- **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 provided categories. (3-ESS2-2)

##### **Mathematics**

- MP.2 Reason abstractly and quantitatively. (3-ESS2-1), (3-ESS2-2), (3-ESS3-1)
- MP.4 Model with mathematics. (3-ESS2-1), (3-ESS2-2), (3-ESS3-1)
- MP.5 Use appropriate tools strategically. (3-ESS2-1)
- 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)

#### **Unit Understandings:**

*Students will understand that...*

- Data can be represented in tables and graphical displays to describe typical weather conditions expected during a particular season
- information can be obtained and combined to describe climates in different regions of the world.
- Water forms beads on waterproof materials and soaks into absorbent materials.
- Water moves downhill. The angle of the slope and the amount of water affect flow.
- Temperature is a measure of how hot matter is.
- Water expands when heated and contracts when cooled.

- A material that floats in water is less dense than the water; a material that sinks is denser.
- Cold water is denser than warm water.
- Water expands when it freezes; ice is less dense than liquid water.
- Ice melts when heated; water freezes when cooled.
- The Sun's energy drives weather. Weather data in tables and in graphic displays, may show patterns over time.
- Climate is the average or typical weather that can be expected to occur in a region, based on long-term observation and data analysis.
- Weather-related natural hazards include tornadoes, hailstorms, blizzards, lightning, floods, and drought.
- People often modify their homes and their way of life to deal with floods. Wetland protection and restoration is one way to prevent floods.
- Soil is rock particles mixed with organic material called humus.
- Soils retain more water than rock particles alone.
- Water drains more easily through some earth materials than through others.
- The energy of flowing water can be used to do work; waterwheels are machines powered by flowing water.

### **Unit Essential Questions:**

- How is water involved in weather?
- Are weather conditions the same around the world and throughout the year?
- What factors affect daily weather?
- What factors affect an area's climate?
- How can data be used to determine the climate of various regions? What data can we collect to describe typical weather conditions during a particular season, and how can we represent this data in tables and graphical displays?
- How do weather patterns vary across different seasons, and what can we learn from these variations?
- What factors contribute to the climate of different regions around the world, and how do these climates affect the daily lives of people living there?
- How do scientists record and analyze weather patterns over time to make predictions about future weather conditions?
- What are some common weather-related hazards, and how do they impact communities and the environment?
- What design solutions can we propose to reduce the impacts of weather-related hazards, and how do these solutions work to protect people and property?
- How can we use data and evidence to support our claims about the effectiveness of design solutions for weather-related hazards?
- How can understanding weather and climate help us make informed decisions about how we interact with our surroundings and plan for the future?

### **Knowledge and Skills:**

*Students will know...*

- Weather includes temperature, precipitation, and wind on a day to day basis.
- Climate is the typical weather patterns over many years.
- How to use tools such as a thermometer, rain gauge, and wind vane to collect weather data.
- Climates vary around the world due to different amounts of rain, varying temperatures, and wind patterns.
- Weather is measured using observations and tools such as thermometers, wind vanes, and rain gauges.



- Evaporation is the process by which liquid (water) changes into gas (water vapor). High temperatures, greater surface area, and moving air (wind) increase the rate of evaporation.
- Condensation is the process by which gas (water vapor) changes into liquid water; it occurs on a cool surface.
- Evaporation and condensation contribute to the movement of water through the water cycle.

*Students will be able to...*

- Predict weather conditions based on information collected.
- Analyze and interpret data to understand what is the climate in different parts of the world.
- Ask questions about what caused changes in weather patterns.
- Collect data using tools such as thermometers, rain gauge, and a wind vane.
- Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

## **EVIDENCE OF LEARNING**

### **Assessment:**

*What evidence will be collected and deemed acceptable to show that students truly “understand”?*

- **End of Unit Common assessments: see assessment folder for links to common assessments**
- Notebook entries
- Response sheets
- Performance assessments throughout investigations
- Investigation I-Checks

### **Learning Activities:**

*What differentiated learning experiences and instruction will enable all students to achieve the desired results?*

#### **Investigation 2-Hot Water, Cold Water**

- Part 1 Measuring Temperature
- Part 2 Build a Thermometer

#### **Cloud in a Jar Demonstration**

**Convection Demonstration Activity:** [w Convection Demo Activity Grade 3 Science.docx](#)

#### **Investigation 3-Weather and Water**

- Part 1 Measuring Water
- Part 2 Evaporation
- Part 3 Surface Area
- Part 4 Evaporation Locations
- Part 5 Condensation

### **Investigation 4-Season and Climate**

- Part 1 Seasonal Weather
- Part 2 Describing Climate
- Part 3 Weather Related Natural Hazards

## ***RESOURCES***

### **Teacher Resources:**

- NJCTL <https://njctl.org/materials/units/weather-climate-1/?open=Teacher%20Resource>
- Next Generation Science Standards (<https://www.nextgenscience.org/>)
- FOSS Kit Investigations Guide
- FOSS Web Resources
- Assessment Guide
- Generation Genius
- Mystery Science
- Edpuzzle
- Discovery Education
- ThinkLink
- Kahoot
- Legends of Learning
- pbskids.org
- Readworks.org

### **Equipment Needed:**

- SmartBoard or Interactive White Board
- Kit Materials—see materials needed per investigation (See Materials Section in Teachers Guide)
- Mason jar, matches, ice, w
- Safety posters
- Laptops or computers/headphones
- White boards and markers
- Notebook Sheets
- FOSS Web Resources
- Word Wall materials
- Home/School Connections Materials
- Library books as specified in materials section of teachers guide
- Science Notebooks
- Science Resources Book
- Assessment Materials per Investigation

## UNIT OVERVIEW

**Content Area:** Science

**Unit Title:** Motion and Matter

**Target Course/Grade Level:** Grade 3

**Unit Summary:** In this unit of study, students will be able to determine the effects of balanced and unbalanced forces on the motion of an object. Students will examine the effects of balanced and unbalanced forces on the motion of an object and the cause-and-effect relationships of electrical or magnetic interactions to define a simple design problem that can be solved with magnets. The crosscutting concepts of patterns and cause and effect are called out as organizing concepts for these disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in planning and carrying out investigations. Students are also expected to use these practices to demonstrate understanding of the core ideas.

**Approximate Length of Unit:** About 10 Weeks

## LEARNING TARGETS

### NJ Student Learning Standards:

#### Science:

- **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. *Examples could include an unbalanced force on one side of a ball can make it start moving; and, balanced forces pushing on a box from both sides will not produce any motion at all.*
- **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. *Examples of motion with a predictable pattern could include a child swinging in a swing, a ball rolling back and forth in a bowl, and two children on a see-saw.*
  - **DCI: 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 level.) (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 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)

- **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. *Examples of an electric force could include the force on hair from an electrically charged balloon and the electrical forces between a charged rod and pieces of paper; examples of a magnetic force could include the force between two permanent magnets, the force between an electromagnet and steel paperclips, and the force exerted by one magnet versus the force exerted by two magnets. Examples of cause and effect relationships could include how the distance between objects affects strength of the force and how the orientation of magnets affects the direction of the magnetic force.*
- **3-PS2-4.** Define a simple design problem that can be solved by applying scientific ideas about magnets. *Examples of problems could include constructing a latch to keep a door shut and creating a device to keep two moving objects from touching each other.*

#### **Career Readiness, Life Literacies, and Key Skills:**

- **9.4.2.CI.1:** Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
- **9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
- **9.4.2.CT.2:** Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
- **9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
- **9.4.2.DC.1:** Explain the differences between ownership and sharing of information.
- **9.4.2.DC.2:** Explain the importance of respecting the digital content of others.
- **9.4.2.IML.3:** Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults (e.g., 6.3.2.GeoGI.2, 6.1.2.HistorySE.3, W.2.6, 1-LSI-2).
- **9.4.2.IML.4:** Compare and contrast the way information is shared in a variety of contexts (e.g., social, academic, athletic) (e.g., 2.2.2.MSC.5, RL.2.9).
- **9.4.2.IML.4:** Compare and contrast the way information is shared in a variety of contexts (e.g., social, academic, athletic) (e.g., 2.2.2.MSC.5, RL.2.9).

#### **Technology:**

- 8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
- 8.1.5.D.3 Demonstrate an understanding of the need to practice cyber safety, cyber security, and cyber ethics when using technologies and social media.
- 8.1.5.D.4 Understand digital citizenship and demonstrate an understanding of the personal consequences of inappropriate use of technology and social media

#### **Interdisciplinary Connections and Standards:**

##### **ELA/Literacy**

- 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)
- 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)

- SL.3.3 Ask and answer questions about information from a speaker, offering appropriate elaboration and detail. (3- PS2- 3)

**Mathematics**

- MP.2 Reason abstractly and quantitatively. (3-PS2-1)
- MP.5 Use appropriate tools strategically. (3-PS2-1)
- 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)

**Unit Understandings:**

*Students will understand that...*

- Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
- Make observations and/or measurements of an object’s motion to provide evidence that a pattern can be used to predict future motion
- Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other
- Define a simple design problem that can be solved by applying scientific ideas about magnets

**Unit Essential Questions:**

- What causes objects to move?
- What causes change of motion?
- Why is it important to measure accurately?

**Knowledge and Skills:**

*Students will know...*

- Forces are pushes and pulls. Motion occurs in predictable patterns.
- The cause and effect relationships of electric interaction.
- The cause and effect relationships of magnetic interactions.
- Magnets can be used to solve design problems

*Students will be able to...*

- Plan and conduct investigations about forces.
- Make observations and measurements of motion.
- Ask questions about electric and magnetic interactions.
- Define a problem that can be solved with magnets

**EVIDENCE OF LEARNING**

**Common Assessments:**

*What evidence will be collected and deemed acceptable to show that students truly “understand”?*

- Notebook entries

- Response sheets
- Performance assessments throughout investigations
- Investigation I-Checks
- Common Assessment <https://njctl.org/materials/units/motion-and-stability/?open=Presentation>

### Learning Activities:

*What differentiated learning experiences and instruction will enable all students to achieve the desired results?*

### Instructional Presentation: Motion & Stability Unit (Forces) Grade 3.pptx

#### FOSS Investigation 1- Forces

- Part 1 Two Forces
- Part 2 Magnetic-Force Investigation
- Part 3 More about Forces

#### FOSS Investigation 2-Patterns of Motion

- Part 1 Wheel-and-Axle Systems
- Part 2 Predicting Motion of New Systems

#### FOSS Electromagnetic Force Investigation 2

- Part 1 Properties of Magnets
- Part 2 Magnetic Fields

## *RESOURCES*

### Teacher Resources:

- NJCTL <https://njctl.org/materials/units/motion-and-stability/?open=Presentation>
- Next Generation Science Standards (<https://www.nextgenscience.org/>)
- FOSS Kit Investigations Guide
- FOSS Web Resources
- Assessment Guide
- Generation Genius
- Mystery Science
- Edpuzzle
- Discovery Education
- ThinkLink
- Kahoot
- Legends of Learning
- pbskids.org
- Readworks.org

### Equipment Needed:

- SmartBoard or Interactive White Board
- Kit Materials—see materials needed per investigation (See Materials Section in Teachers Guide)
- Safety posters
- Laptops or computers/headphones
- White boards and markers
- Notebook Sheets

- FOSS Web Resources
- Word Wall materials
- Home/School Connections Materials
- Library books as specified in materials section of teachers guide
- Science Notebooks
- Science Resources Book
- Assessment Materials per Investigation

## UNIT OVERVIEW

**Content Area:** Science

**Unit Title:** Structures of Life

**Target Course/Grade Level:** Grade 3

**Unit Summary:** In this unit of study, students develop an understanding of the similarities and differences in organisms' life cycles. Students acquire an understanding that organisms have different inherited traits and that the environment can also affect the traits that an organism develops. In addition, students 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. The crosscutting concepts of patterns and cause and effect are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in developing and using models and constructing explanations and designing solutions. Students are also expected to use these practices to demonstrate understanding of the core ideas.

**Approximate Length of Unit:** About 15 Weeks

## LEARNING TARGETS

### NJ Student Learning Standards:

#### Science:

- 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-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. *Examples of the environment affecting a trait could include normally tall plants grown with insufficient water are stunted; and, a pet dog that is given too much food and little exercise may become overweight.*
- 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. *Examples of cause and effect relationships could be plants that have larger thorns than other plants may be less likely to be eaten by predators; and, animals that have better camouflage coloration than other animals may be more likely to survive and therefore more likely to leave offspring.*
- 3-LS2-1. Construct an argument that some animals form groups that help members survive.
- 3-LS4-1. Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago. *Examples of data could include type, size, and distributions of fossil organisms. Examples of fossils and environments could include marine fossils found on dry land, tropical plant fossils found in Arctic areas, and fossils of extinct organisms..*
- 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. *Examples of evidence could*



*include needs and characteristics of the organisms and habitats involved. The organisms and their habitat make up a system in which the parts depend on each other.*

- 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. *Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.*

### **Career Readiness, Life Literacies, and Key Skills:**

#### **Technology:**

- **8.1.2.A.4** Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
- **8.1.5.A.1** Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
- **8.1.5.D.3** Demonstrate an understanding of the need to practice cyber safety, cyber security, and cyber ethics when using technologies and social media.
- **8.1.5.D.4** Understand digital citizenship and demonstrate an understanding of the personal consequences of inappropriate use of technology and social media.

### **Interdisciplinary Connections and Standards:**

#### **ELA/Literacy**

- **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)
- **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)
- **SL.3.3** Ask and answer questions about information from a speaker, offering appropriate elaboration and detail. (3-PS2-3)

#### **Mathematics**

- **MP.2** Reason abstractly and quantitatively. (3-PS2-1)  
Analyze and Interpret Data: 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-LS4-1)

### **Unit Understandings:**

*Students will understand that...*

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

### Unit Essential Questions:

- How are all the different kinds of plants and animals able to continue to exist on Earth?
- What changes do organisms go through during their life cycle?
- How is a plant life cycle similar to an animal's life cycle? How is it different?
- What are different patterns of animal development?
- What are the advantages and disadvantages of group living?

### Knowledge and Skills:

*Students will know...*

- The pattern of life cycles include birth, growth, reproduction, and death
- Plants and animals reproduce to create more plants and animals
- Solitary organisms have to collect resources and benefit particular organisms.
- Reproduction is necessary for all organisms.
- Variations in grouping affect the survival of organisms.
- Animals are either solitary or live in groups.
- Animal groups vary widely in size, even among the same species.

*Students will be able to...*

- Create a model of flowering plant life cycle
- Create a model of an animal life cycle
- Distinguish the similarities and differences between the life cycles of plants and animals
- Analyze an organism and determine how their social behavior helps their survival
- Ask questions about organisms and why they choose the social behavior they do.
- Understand advantages of group living through experience working in a group.
- Understand disadvantages of group living through experience working in a group or observing others work in a group.
- Explain some animal behavior in relation to group or solitary living.

## EVIDENCE OF LEARNING

### Assessment:

*What evidence will be collected and deemed acceptable to show that students truly "understand"?*

- **Growth & Development Common Assessment: see common assessment folder for links**
- Notebook entries
- Response sheets
- Performance assessments throughout investigations
- Investigation I-Checks

### Learning Activities:

*What differentiated learning experiences and instruction will enable all students to achieve the desired results?*

#### FOSS Investigations:

##### Investigation 1- Origin of Seeds

- Part 1 Seed Search
- Part 4 Seed Dispersal

##### Investigation 2- Growing Further

- Part 1 Germination and Growth
- Part 2 Life Cycle of the Bean

### **Investigation 3- Meet the Crayfish**



- Part 1 Crayfish Structures
- Part 2 Adaptation
- Part 3 Crayfish Territory
- Part 4 Compare Crayfish to Other Animals
- Part 5 Food Chains

### **Investigation 4- Human Body**

- Part 1 Counting Bones
- Part 3 Joints and Muscles
- Part 4 Fingerprints

## ***RESOURCES***

### **Teacher Resources:**

- Growth & Development:  Growth & Development Presentation Grade 3.pptx
- Growth & Development Worksheets:  Growth & Development Worksheets.docx
- NJCTL <https://njctl.org/materials/units/ecosystems-group-behavior/?open=Teacher%20Resource>
- NJCTL <https://njctl.org/materials/units/inheritance-of-traits-1/>
- NJCTL <https://njctl.org/materials/units/growth-and-development-of-organisms/>
- Next Generation Science Standards (<https://www.nextgenscience.org/>)
- FOSS Kit Investigations Guide
- FOSS Web Resources
- Assessment Guide
- Generation Genius
- Mystery Science
- Edpuzzle
- Discovery Education
- ThinkLink
- Kahoot
- Legends of Learning
- pbskids.org
- Readworks.org

### **Equipment Needed:**

- SmartBoard or Interactive White Board
- Kit Materials—see materials needed per investigation (See Materials Section in Teachers Guide)
- Safety posters
- Laptops or computers/headphones
- White boards and markers
- Notebook Sheets
- FOSS Web Resources
- Word Wall materials
- Home/School Connections Materials
- Library books as specified in materials section of teachers guide
- Science Notebooks

- Science Resources Book
- Assessment Materials per Investigation