

COURSE: Science	GRADE(S): 3 rd Grade
UNIT: The Processes of Science	

NATIONAL STANDARDS:
SCIENCE THEMES: Systems and interactions, models, patterns of change, change over time

STATE STANDARDS:	
3.1.4.A	Know that natural and human-made objects are made up of parts.
	<ul style="list-style-type: none"> Identify and describe what parts make up a system. Identify system parts that are natural and human-made (e.g., ball point pen, simple electrical circuits, plant anatomy). Describe the purpose of analyzing systems. Know that technologies include physical technology systems (e.g., construction, manufacturing, and transportation), informational systems and biochemical-related systems.
3.1.4.B	Know models as useful simplifications of objects or processes.
	<ul style="list-style-type: none"> Identify different types of models. Identify and apply models as tools for prediction and insight. Apply appropriate simple modeling tools and techniques. Identify theories that serve as models (e.g., molecules).
3.1.4.C	Illustrate patterns that regularly occur and reoccur in nature.
	<ul style="list-style-type: none"> Identify observable patterns (e.g., growth patterns in plants, crystal shapes in minerals, climate, and structural patterns in bird feathers). Use knowledge of natural patterns to predict next occurrences (e.g., seasons, leaf patterns, lunar phases).
3.1.4.D	Know that scale is an important attribute of natural and human made objects, events and phenomena.
	<ul style="list-style-type: none"> Identify the use of scale as it relates to the measurement of distance, volume and mass. Describe scale as a ration (e.g., map scales). Explain the importance of scale in producing models and apply it to a model.
3.1.4.E	Recognize change in natural and physical systems.
	<ul style="list-style-type: none"> Recognize change as fundamental to science and technology concepts. Examine and explain change by using time and measurement. Describe relative motion. Describe the change to objects caused by heat, cold, light or chemicals.
3.2.4.A	Identify and use the nature of scientific and technological knowledge.
	<ul style="list-style-type: none"> Distinguish between a scientific fact and belief. Provide clear explanations that account for observations and results. Relate how new information can change existing perceptions.
3.2.4.B	Describe objects in the world using the five senses.
	<ul style="list-style-type: none"> Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-rough). Use observations to develop a descriptive vocabulary.
3.2.4.C	Recognize and use the elements of scientific inquiry to solve problems.
	<ul style="list-style-type: none"> Generate questions about objects, organisms and/or events that can be answered through scientific investigations. Design an investigation. Conduct an experiment. State a conclusion that is consistent with the information.

3.2.4.D Recognize and use the technological design process to solve problems.

- Recognize and explain basic problems.
- Identify possible solutions and their course of action.
- Try a solution.
- Describe the solution, identify its impacts and modify if necessary.
- Show the steps taken and the results.

ASSESSMENT ANCHORS:

S4.A.1 Reasoning and Analysis

S4.A.1.1 Identify and explain the pros and cons of applying scientific, environmental, or technological knowledge to possible solutions to problems.

S4.A.2 Processes, Procedures and Tools of Scientific Investigations

S4.A.2.1 Apply skills necessary to conduct an experiment or design a solution to solve a problem.

S4.A.2.2 Identify appropriate instruments for a specific task and describe the information the instrument can provide.

KEY CONCEPTS:

1. Inquiry, problem solving, critical thinking, measurement, communications, and links to real world applications should be integrated throughout science instruction to develop an understanding of the key concepts and content.
2. The use of technology as a tool for investigating, communicating and doing science must also be integrated throughout this instruction.

UNIT OBJECTIVES:

Students will:

1. *Recognize and use the elements of scientific inquiry to solve problems as a group and/or individually (generate questions, design an investigation, conduct an experiment, collect data, draw conclusions).*
 - Use science tools throughout inquiry method (e.g. hand lens, forceps, magnifying box, eye dropper, and thermometer, ruler, measuring tape and cup, spring scale, microscope).
 - Ask questions about objects, organisms, and events in the environment.
 - Plan and conduct a simple investigation.
 - Employ simple equipment and tools to gather data and extend the senses.
 - Use data to construct a reasonable explanation.
 - Communicate investigations and explanations.
2. *Develop understandings about scientific inquiry.*
 - Scientific investigations involve asking and answering a question and comparing the answer with what scientists already know about the world.
 - Scientists use different kinds of investigations depending on the questions they are trying to answer. Types of investigations include describing objects, events, and organisms; classifying them; and doing a fair test (experimenting).
 - Simple instruments, such as magnifiers, thermometers, and rulers, provide more information that scientists obtain only using their senses.
 - Scientists develop explanations using observations (evidence) and what they already know about the world (scientific knowledge). Good explanations are based on evidence from investigations.
 - Scientists make the results of their investigations public; they describe the investigations in ways that enable others to repeat the investigations.
 - Scientists review and ask questions about the results of other scientists' work.

3. *Recognize and use the technological design process to solve problems.*

- By recognizing and explaining basic problems.
- Identifying possible solutions and their course of actions.
- Identifying its impact and modifying if necessary.
- Showing the steps taken and the results.
- Identify a simple problem, propose a solution, implement proposed solution, evaluate product or design, and communicate a problem, design, and solution.

4. *Use Scientific Methods for Science Inquiry.*

- Ask a question, you might have a question about something you observe.
- State your hypothesis. (A hypothesis is a possible answer to your question.)
- Identify and control variables. Variables are things that can change. For a fair test, you choose just one variable to change. Keep all other variables the same.
- Test your hypothesis. Make a plan to test your hypothesis. Collect materials and tools then follow your plan.
- Collect and record your data. Keep good records of what you do and find out. Use tables and pictures to help.
- Interpret your data. Organize your notes and records to make them clear. Make diagrams, charts, or graphs to help.
- State your conclusion. Your conclusion is a decision you make based on your data. Communicate what you found out. Tell whether or not your data supported your hypothesis.
- Go further. Use what you learn. Think of new questions to test or better ways to do a test.

5. *Understand all safety rules for completing science activities.*

- Listen to your teacher's instruction.
- Read each activity carefully.
- Never taste or smell materials unless your teacher tells you to.
- Wear safety goggles when needed.
- Handle scissors and other equipment carefully.
- Clean up spills immediately.
- Tell your teacher immediately about accidents or if you see something that looks unsafe.
- Wash your hands well after every activity.

SUGGESTED ACTIVITIES:

Students will:

1. Labs
2. Experiments
3. Hands on activities

RESOURCES:

Harcourt,
Houghton Mifflin
Scott Foresman
Science Resource Books

ASSESSMENTS:

- ✧ Lab journals
- ✧ Experiment forms
- ✧ Rubrics
- ✧ Formal/Informal observations
- ✧ Projects

REMEDIATION:

- ✧ Peer support
- ✧ Cooperative learning
- ✧ One-on-one assistance

ENRICHMENT:

- ✧ Extension activities related to topic.

COURSE: Science	GRADE(S): 3 rd Grade
UNIT: Earth Science - Unit 1: Weather	

NATIONAL STANDARDS:

SCIENCE THEMES: Systems and interactions, models, patterns of change, change over time.

PROCESS SKILLS: Observing, classifying, analyzing and interpreting data, formulating hypotheses, predicting, experimenting/testing, variable recognition and control.

STATE STANDARDS:

3.5.4.C Know basic weather elements.

- Identify cloud types.
- Identify weather patterns from data charts (including temperature, wind direction and speed, precipitation) and graphs of the data.
- Explain how the different seasons affect plants, animals, food availability and daily human life.

4.1.4.B Explain the difference between moving and still water.

- Explain why water moves or does not move.
- Identify types of precipitation.

4.2.4.A Identify needs of people.

- Identify plants, animals, water, air, minerals and fossil fuels as natural resources.
- Explain air, water and nutrient cycles.
- Identify how the environment provides for the needs of people.

4.6.4.B Understand the concept of cycles.

- Explain the water cycle.
- Explain the carbon dioxide/oxygen cycle (photosynthesis).

ASSESSMENT ANCHORS:

S4.A.3 Systems, Models and Patterns
S4.A.3.2 Use models to illustrate simple concepts and compare the models to what it represents.

S4.D.1 Earth Features and Processes that Change Earth and Its Resources
S4.D.1.3 Describe Earth's different sources of water or describe changes in the form of water.

S4.D.2 Weather, Climate and Atmospheric Processes
S4.D.2.1 Identify basic weather conditions and how they are measured.

KEY CONCEPTS:

- There are cycles and processes that continually reshape the earth.
- The water cycle describes how water changes state and moves between the air and Earth's surface.
- There are factors that influence weather, such as clouds, temperature, precipitation, and wind and these factors can be measured.

UNIT OBJECTIVES:

Students will:

- Identify and label the parts of the water cycle*
 - Water is found in a variety of places on Earth. (e.g., salt water in oceans and seas, fresh water in glaciers or water from rain that flows into rivers, streams, ponds, and lakes.

Groundwater is an underground supply of fresh water)

- The water cycle is water moving from Earth's land through rivers toward the ocean, to the air, and back again. (Precipitation, evaporation, condensation)
- Precipitation is rain, snow, sleet, or hail.
- Evaporation is water that has changed to water vapor.
- Condensation is the process of gas turning into a liquid.
- Water on Earth is in one of three states (e.g. liquid, solid, gas).

2. *Identify appropriate instruments (i.e., thermometer, rain gauge, weather vane, barometer, and anemometer to study weather and what they measure)*

- Weather is what is happening in the atmosphere at a certain time and place.
- Temperature is the measure of how hot or cold something is.
- *An anemometer*; measures wind speed.
- *A rain gauge*; measures the depth of rain which falls in a certain place.
- *A thermometer*; measures temperature.
- *A weather vane*; shows the direction wind is blowing.
- *A barometer*; is used to measure air pressure.

3. *Identify types of clouds (cirrus, cumulus, stratus fog, cumulonimbus)*

- Clouds are made of tiny droplets of liquid water.
- Cirrus clouds are the highest and look like wisps of hair (indicate good weather).
- Cumulus clouds are lower clouds and look puffy (usually indicate good weather).
- Stratus are the lowest and look like a sheet or layer of clouds (indicate light rain).
- Cumulonimbus clouds are heavy and gray (indicate bad weather).

4. *Name and describe different kinds of precipitation (rain, snow, sleet, hail, freezing rain)*

- Rain is in liquid form present during warm weather.
- Snow is found when low temperatures exist.
- Hail forms when liquid water freezes into ice pellets that get larger as they are blown up and down within the clouds.
- Sleet is rain that freezes as it falls from clouds to Earth.
- Freezing rain is liquid rain that freezes as it strikes cold objects or cold ground.

SUGGESTED ACTIVITIES:

Students will:

1. Harcourt InstaLabs and unit activities.
2. Observe different types of clouds at various times throughout the school week, illustrate and label.
3. Design a poster (illustrate or cut pictures from magazines) indicating all types of clouds and detail the weather indicated by each cloud.
4. Describe the processes of evaporation, condensation, and precipitation as they relate to the water cycle.
5. Construct and interpret a model of the water cycle.
6. Identify major water sources for a community, including rivers, reservoirs, and wells. Describe the major water sources for the local community.
7. Write a water cycle fact booklet summarizing important water cycle facts.
8. Demonstrate condensation by filling two empty drinking glasses: one with warm water and the other one with ice cubes and cold water.

ASSESSMENTS:

- ✧ Science Journal
- ✧ Rubrics
- ✧ Tests/Quizzes
- ✧ Labs/Experiments
- ✧ Observations

REMEDICATION:

- ✧ Partner work
- ✧ Group work
- ✧ One-on-one assistance
- ✧ Small group instruction

ENRICHMENT:

- ✧ Web quests
- ✧ Extension projects
- ✧ Develop a game to practice cloud identification.

9. Observe condensation by exhaling onto a mirror held a few inches from your mouth.
10. Demonstrate precipitation: boil water in a tea kettle.
11. Design a water cycle wheel which sequences the events of the water cycle.
12. Differentiate the processes involved with precipitation, condensation, and evaporation.
13. Each student writes five weather facts and five weather opinions. Collect and redistribute: students should correctly sort information into fact and opinion statements.
14. Develop precipitation poems describing favorite activities during wet weather days.

RESOURCES:

Harcourt
Houghton Mifflin
Scott Foresman Science Series

COURSE: Science	GRADE(S): 3 rd Grade
UNIT: Earth Science - Unit 2: Rocks and Minerals	

NATIONAL STANDARDS:

SCIENCE THEMES: Systems and interactions, models, patterns of change, change over time.

PROCESS SKILLS: Observing, classifying, analyzing and interpreting data, formulating hypotheses, predicting, experimenting/testing, variable recognition and control.

STATE STANDARDS:

3.5.4.A Know basic landforms and earth history.

- Describe earth processes (e.g., rusting, weathering, erosion) that have affected selected physical features in students' neighborhoods.
- Identify various earth structures (e.g., mountains, faults, drainage basins) through the use of models.
- Identify the composition of soil as weathered rock and decomposed organic remains.
- Describe fossils and the types of environment they lived in (e.g., tropical, aquatic, desert).

3.5.4.B Know types and uses of earth materials.

- Identify uses of various earth materials (e.g., buildings, highways, fuels, growing plants).
- Identify and sort earth materials according to a classification key (e.g., soil/rock type).

3.5.4.C Know basic weather elements.

- Identify cloud types.
- Identify weather patterns from data charts (including temperature, wind direction and speed, precipitation) and graphs of the data.
- Explain how the different seasons affect plants, animals, food availability and daily human life.

3.5.4.D Recognize the earth's different water resources.

- Know that approximately three-fourths of the earth is covered by water.
- Identify and describe types of fresh and salt water bodies.
- Identify examples of water in the form of solid, liquid and gas on or near the surface of the earth.
- Explain and illustrate evaporation and condensation.
- Recognize other resources available from water (e.g., energy, transportation, minerals, food).

ASSESSMENT ANCHORS:

S4.D.1 Earth Features and Processes that Change and Its Resources.

S4.D.1.1 Describe basic landforms in Pennsylvania.

S4.D.1.3 Describe Earth's different sources of water or describe changes in the form of water.

KEY CONCEPTS:

1. There are cycles and processes that continually reshape the earth.
2. Earth provides a variety of resources.

UNIT OBJECTIVES:

Students will:

1. *Identify certain types of rocks and minerals.*
 - A mineral is a solid formed in nature and has never been alive.
 - Minerals can be identified by hardness and color (Moh's hardness scale, Streak tests for color).
 - A rock is a naturally formed solid made of one or more minerals.
 - Igneous rock was once melted and then cooled and hardened (volcanic rock like obsidian).
 - Sedimentary rock has layers of sediment that were deposited, usually on the bottom of rivers, lakes or oceans then pressed together to form rock (sandstone).
 - Metamorphic rock has been changed by heat and pressure (slate, marble).

2. *Identify changes in the earth's surface, i.e., the rock cycle*
 - The process of rocks changing from one form to another is called the rock cycle. Any rock can become a different type of rock. (e.g., Metamorphic rock can be broken down into bits or sediment to form Sedimentary rock).
 - Fossils are traces or remains of living things that died a long time ago. (Most fossils form in Sedimentary rock).

3. *Describe earth's landforms and how they changed.*
 - Landforms are natural shapes on Earth's surface.
 - Mountains are Earth's highest landform. It is a place on Earth that is much higher than the land around it. (Note: Pennsylvania's Delaware Water Gap mountains are an example of folded mountains.)
 - A valley is a low area between higher landforms such as mountains.
 - A canyon is a valley with steep sides that have been carved out by forces of nature (e.g., The Grand Canyon).
 - A plain is a wide, flat area on Earth's surface covered mostly by grasses.
 - A plateau is a flat area higher than the land around it. They can be wide with steep sides.
 - Landforms can change slowly over time through weathering, erosion, and glaciers.
 - Weathering can be caused by wind or water which breaks down rocks into smaller pieces.
 - After rocks are broken down erosion moves the pieces of weathered rocks.
 - Glaciers form where it is so cold the snow never melts. The snow piles up and turns to ice. When the glaciers move they pick up rocks and soil.
 - Landforms can change quickly over time by earthquakes, volcanoes, or floods.
 - Earthquakes are the shaking of the Earth's surface caused by movement in the Earth's crust. They create cracks in the Earth's surface and uneven ground.
 - Volcanoes are openings in the Earth's surface from which lava flows. When they erupt they change the Earth's surface quickly. Lava, rock, and ash cover the land around them.
 - Floods sweep over land destroying buildings and crops. Soil is carried by flood waters changing the surface of the land.

4. *Identify some types of Earth's resources.*
 - Resources are materials found in nature used by living things (e.g. water, air, soil, trees).
 - Different types of soil are valuable resources.
 - Soil is made up of water, air, humus and tiny pieces of rock.
 - Humus is the part of soil made up of dead plants and animals (e.g. leaves fall to the ground, break down into smaller parts, and become humus).
 - Sand is soil with tiny pieces of rock that you can see with your eyes.
 - Silt is rock with grains too small to see with your eyes.
 - Clay has very, very tiny grains of rock.
 - Loam is a mixture of humus, clay, silt, and sand (e.g., important for farming, very rich soil used for growing fruits and vegetables).

<p>SUGGESTED ACTIVITIES:</p> <p><i>Students will:</i></p> <ol style="list-style-type: none"> 1. Students will create volcanoes using clay or Model Magic. 2. Create rock cycle wheels 3. Students will illustrate landform booklets. 4. Create earthquake rock blocks to show how earthquakes affect the earth. 5. Make a model rock. 6. Conduct rock streak tests for color 7. Conduct rock scratch tests for hardness 8. Create Sedimentary sandwiches to show layers of rock. (peanut butter, jelly, bread, raisins, marshmallow fluff) 9. Create fossils from Plaster of Paris or clay. 10. Create landforms using clay 11. Complete Fading Away activity to demonstrate mechanical and chemical weathering. 12. Complete Inside a volcano booklet. 13. Complete Sedimentary, Igneous, and Metamorphic Rock booklets. 14. Use InstaLabs and Investigation activities from Harcourt Science Series <p>RESOURCES: Harcourt Houghton Mifflin Scott Foresman Science Series The Many Faces of Delaware Water Gap Geology Curriculum</p>	<p>ASSESSMENTS:</p> <ul style="list-style-type: none"> ✧ Science Journal ✧ Checklists ✧ Rubrics ✧ Tests/Quizzes ✧ Observations <p>REMEDIATION:</p> <ul style="list-style-type: none"> ✧ Partner work ✧ Group work ✧ One-on-one assistance ✧ Small group instruction <p>ENRICHMENT:</p> <ul style="list-style-type: none"> ✧ Independent extension activities ✧ Research and present visuals and information on an active volcano.
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COURSE: Science	GRADE(S): 3 rd Grade
UNIT: Physical Science - Unit 1: Forces – Simple Machines	

<p>NATIONAL STANDARDS:</p> <p>SCIENCE THEMES: Systems and interactions, models, patterns of change, stability (constancy), energy, change over time.</p> <p>PROCESS SKILLS: Observing, classifying, measuring, analyzing and interpreting data, formulating hypotheses, predicting, experimenting/testing, and variable recognition.</p>

<p>STATE STANDARDS:</p> <p>3.1.4 A Know that natural and human-made objects are made up of parts.</p> <ul style="list-style-type: none"> • Identify and describe what parts make up a system. • Identify system parts that are natural and human-made (e.g. ball point pen, simple electrical circuits, plant anatomy). • Describe the purpose of analyzing systems. • Know that technologies include physical technology systems (e.g., construction, manufacturing, and transportation), informational systems and biochemical-related systems. <p>3.1.4.B Know models as useful simplifications of objects or processes.</p> <ul style="list-style-type: none"> • Identify different types of models. • Identify and apply models as tools for prediction and insight. • Apply appropriate simple modeling tools and techniques. • Identify theories that serve as models (e.g., molecules). <p>3.1.4.D Know that scale is an important attribute of natural and human made objects, events and phenomena.</p> <ul style="list-style-type: none"> • Identify the use of scale as it relates to the measurement of distance, volume and mass. • Describe scale as a ration (e.g., map scales). • Explain the importance of scale in producing models and apply it to a model. <p>3.1.4.E Recognize change in natural and physical systems.</p> <ul style="list-style-type: none"> • Recognize changes as fundamental to science and technology concepts. • Examine and explain change by using time and measurement. • Describe relative motion. • Describe the change to objects caused by heat, cold, light or chemicals. <p>3.2.4 A Identify and use the nature of scientific and technological knowledge.</p> <ul style="list-style-type: none"> • Identify and use the nature of scientific and technological knowledge. • Provide clear explanations that account for observations and results. • Relate how new information can change existing perceptions. <p>3.2.4.B Describe objects in the world using the five senses.</p> <ul style="list-style-type: none"> • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-rough). • Use observations to develop a descriptive vocabulary. <p>3.2.4.C Recognize and use the elements of scientific inquiry to solve problems.</p> <ul style="list-style-type: none"> • Generate questions about objects, organisms and/or events that can be answered through scientific investigations. • Design an investigation. • Conduct an experiment. • State a conclusion that is consistent with the information. <p>3.2.4.D Recognize and use the technological design process to solve problems.</p> <ul style="list-style-type: none"> • Recognize and explain basic problems. • Identify possible solutions and their course of action. • Try a solution
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- Describe the solution, identify its impacts and modify if necessary.
- Show the steps taken and the results.

3.4.4 C **Observe and describe different types of force and motion.**

- Identify characteristics of sound (pitch, loudness and echoes).
- Recognize forces that attract or repel other objects and demonstrate them.
- Describe various types of motions.
- Compare the relative movement of objects and describe types of motion that are evident.
- Describe the position of an object by locating it relative to another object or the background (e.g., geographic direction, left, up).

ASSESSMENT ANCHORS:

S4.C.3 Principles of Motion and Force

- S4.C.3.1 Identify and describe different types of force and motion, or the effect of the interaction between force and motion.

KEY CONCEPTS:

1. Forces cause objects to move in different ways. Work is done when force moves an object. Simple machines allow us to change the direction of a force or the strength of a force.

UNIT OBJECTIVES:

Students will:

1. *Observe and describe types of force and motion.*
 - Motion is a change of position (e.g. straight line motion, zig-zag motion, back and forth motion).
 - Position is the location of an object.
 - Distance is how far it is from one location to another. It is measured using inches, yards, and miles or centimeters, meters, and kilometers.
 - Speed is the distance an object moves in a certain period of time.
2. *Identify force as any kind of a push or pull.*
 - There are relative amounts of force required to move an object (e.g. smaller, lighter objects require little force: heavier, larger objects require more force).
 - Gravity is a force that pulls two objects toward one another. Gravity acts on all objects whether they are heavy or light.
 - Friction is a force that causes objects to slow down. When two objects rub together they create friction. Most rough surfaces make more friction than smooth surfaces and that is why you can slide farther on ice than on grass.
 - Magnetic force can be used to push or pull an object made of iron or steel.
3. *Observe and describe work.*
 - Work is done when a force is used to move an object. If the object does not move then no work has been done.
 - Work can be measured by the amount of force used and how far an object has moved.
4. *Identify simple machines and the type of work they perform.*
 - Simple machines have few or no moving parts.
 - A lever is a bar that pivots or turns on a fixed point (e.g., a broom, students should know that the higher on the handle they place their lower hand, the greater the distance the broom will sweep).
 - A fulcrum is the fixed point on a lever (e.g., a nutcracker, its fulcrum is where its arms connect).
 - A wheel and axle is made up of a wheel joined to an axle so the parts turn together (e.g.,

toy car).

- A pulley is a wheel with a rope or chain around it. You pull one end of the rope one way and the other moves in the opposite direction (e.g., clothesline, flagpole).
- An inclined plane is a slanted surface which makes moving and lifting things easier (e.g. ramp).
- A wedge consists of two inclined planes back to back. They are used to force two things apart or to split one thing into two (e.g., knife).
- A screw is a machine you turn to lift an object or to hold two or more objects together (e.g., a wood screw). It is a type of inclined plane.

SUGGESTED ACTIVITIES:

Students will:

1. Create a simple inclined plane (a screw) using triangular paper wrapped around a pencil.
2. K'nex sets, Students will construct levers, inclined planes, pulleys, wedges, wheels and axles.
3. Instalabs and Investigation activities in Harcourt Science series.
4. Simple machines scavenger hunt, students look around the classroom to find simple machines and discuss their uses.
5. Gravity ball drop used to demonstrate gravitational pull on two objects of different sizes (golf ball, basketball)).
6. To the point activity to show the point of balance as in a fulcrum.
7. Magnet Man Task cards to explore forces, attraction, repulsion, and poles of a magnet.
8. Marble Motion activity to show direction and distance an object moves.
9. Test common materials to determine which are attracted to a magnet.
10. Perform an experiment to determine the effect the poles of two magnets have on each other.
11. Produce a magnetic force field and create a drawing to illustrate this force.
12. Make a simple compass and demonstrate the relationship between the magnetism and poles of the compass to those of the earth.
13. Test the transfer of magnetic forces through

ASSESSMENTS:

- ✧ Portfolio with all complete labs, results, and conclusions.
- ✧ Student assessment of hands-on Lab Activities.
- ✧ Unit test and quizzes
 - Review – 3 sheets
 - Test – 3 sheets

REMEDICATION:

- ✧ Partner work
- ✧ One-on-one attention
- ✧ Group work
- ✧ Small group instruction

ENRICHMENT:

- ✧ Independent extension activities

various substances. (water, paper, aluminum foil, glass, etc.)

14. Use magnets to move objects made of iron or steel.

RESOURCES:

Harcourt Science

CNIU 20 Videos

- #8165 PIJ "Simple Machines – Inclined Planes (2nd Edition)"
- #8166 PIJ "Simple Machines – Levers (2nd Edition)"
- #8167 PIJ "Simple Machines – Pulleys (2nd Edition)"
- #8168 PIJ "Simple Machines – Wheels and Axles (2nd Edition)"
- #8169 PIJ "Simple Machines – Working Together (2nd Edition)"
- #7096 "Magnets – The Dragon's Secret"
- #9560 "Mechanical Universe-Magnetic Fields"

"Junior Science Magnets", Terry Jennings

"Amazing Magnets", David Adler

Bill Nye

COURSE: Science	GRADE(S): 3 rd Grade
UNIT: Biology - Unit 1: Plants and Animals	

<p>NATIONAL STANDARDS:</p> <p>SCIENCE THEMES: Systems and interactions, models, patterns of change, change over time.</p> <p>PROCESS SKILLS: Observing, classifying, analyzing and interpreting data, and formulating hypotheses, predicting, experimenting/testing, variable recognition and control.</p>

<p>STATE STANDARDS:</p> <p>3.3.4.A Know the similarities and differences of living things.</p> <ul style="list-style-type: none"> • Identify life processes of living things (e.g., growth, digestion, and react to environment). • Know that some organisms have similar external characteristics (e.g., anatomical characteristics; appendages, type of covering, body segments) and that similarities and differences are related to environmental habitat. • Describe basic needs of plants and animals. <p>3.3.4.B Know that living things are made up of parts that have specific functions.</p> <ul style="list-style-type: none"> • Identify examples of unicellular and multi-cellular organisms. • Determine how different parts of a living thing work together to make the organism function. <p>3.3.4.C Know that characteristics are inherited and, thus, offspring closely resemble their parents.</p> <ul style="list-style-type: none"> • Identify characteristics for animal and plant survival in different climates. • Identify physical characteristics that appear in both parents and offspring and differ between families, strains or species. <p>ASSESSMENT ANCHORS:</p> <p>S4.B.1 Structure and Function of Organisms</p> <p>S4.B.1.1 Identify and describe similarities and differences between living things and their life processes.</p> <p>S4.B.2 Continuity of Life</p> <p>S4.B.2.1 Identify and explain how adaptations help organisms to survive.</p> <p>S4.B.2.2 Identify that characteristics are inherited and, thus, offspring closely resemble their parents.</p>

<p>KEY CONCEPTS:</p> <ol style="list-style-type: none"> 1. Organisms can be grouped according to similarities and differences. 2. Living things are made up of parts that have specific functions. 3. Characteristics are passed from parent to offspring. 4. Relationships exist between components of a system. <p>UNIT OBJECTIVES:</p> <p>Students will:</p> <ol style="list-style-type: none"> 1. <i>Identify and describe and compare living things and their life processes (e.g., growth, digestion, respiration).</i> <ul style="list-style-type: none"> • Plants have life cycles. A lifecycle is a series of changes that a living thing goes through during its lifetime. • Green plants use carbon dioxide, water, and sunlight energy to turn minerals and nutrients into food for growth, maintenance, and reproduction (lima beans can be grown in classroom to demonstrate this process).

- Animals have life stages consisting of birth, growth, development, reproduction, and death. Different animals have their young in different ways but all animals grow and change during their life cycle (mealworms or butterflies can be raised in the classroom to demonstrate this process).
2. *Compare similar functions of external characteristics of organisms (e.g., anatomical characteristics: appendages, type of covering, body segments).*
 - There are common and distinguishing characteristics of groups or vertebrates (animals with backbones), as well as, invertebrates (animals without backbones).
 - Vertebrates can have from zero to four appendages, may be covered by hair or fur, feathers, scales, moist skin, or dry scaly skin.
 - Invertebrates can have a variety of external characteristics, such as: an earthworm with soft tube like bodies, a sea urchin with spiny coverings, or arthropods (our largest group of invertebrates) which have jointed legs, a body with two or more sections, and a hard outer covering called an exoskeleton. Arthropods include insects and spiders.
 3. *Describe plant structures and explain their roles (such as, leaves and photosynthesis).*
 - Plants cannot move from place to place to find food and water like animals can so they have parts that help them get the things they need to stay alive.
 - Roots take in water and nutrients and provide support for the plant.
 - Stems carry water and nutrients through the plant.
 - Leaves collect sunlight and gases from the air to make food.
 - Plants make sugar (their food) by a process called photosynthesis. Plants need light from the sun for photosynthesis. Chlorophyll (the green substance in leaves) helps plants use sunlight. Air is made up of different gases. One type is called carbon dioxide. Plants need this to make sugar. Water soaks into the soil where the roots take it in. Stems carry the water to the leaves. Plants need this water to make sugar. Oxygen is another kind of gas. It is made during photosynthesis. We need to breathe oxygen to stay alive.
 4. *Describe and compare animal structures and their functions.*
 - Vertebrates can be classified into several smaller groups: mammals, birds, fish, reptiles, amphibians.
 - Mammals are animals that have hair or fur to provide warmth. They produce milk for their young. They breathe through lungs, even mammals that live underwater (e.g. humans, whales, bears).
 - Birds have feathers for protection, coloration, and to help with flying. They breathe through lungs, have wings and two legs. Birds have hollow bones to make them lightweight to help with flying.
 - Fish live in water and most have long narrow bodies that make it easy for them to swim. Most fish are covered with scales that have a layer of slime to keep the fish waterproof. Fish breathe through gills.
 - Reptiles have dry scaly skin and breathe through lungs. Reptiles may have no legs (snakes) or four legs (tortoises).
 - Amphibians start life in the water and then lives on land as an adult. When they are young they breathe through gills but as they grow their bodies change and they develop lungs.
 5. *Identify physical characteristics (e.g. height, hair, ability to roll tongue) that appear in both parents and could be passed on to offspring.*
 - Animals have special body parts, features, or ways of doing things that help them survive in their environment.
 - Physical characteristics that help animals survive are passed down or inherited from parents to their young (e.g. webbed feet, bills).
 - Describe the basic needs of animals and components of their habitats.
 - All animals need oxygen, water, food, shelter, and space in order to survive.
 - Describe specific adaptations (for protection and survival) and characteristics for living in a certain area.

- Camouflage helps and protects animals by allowing them to blend into their environment (e.g. the arctic fox changes color to white during the snowy season).
 - Animals use mimicry to copy another animal. The animal being copied is usually more dangerous (a king snake looks similar to a deadly coral snake).
 - Animals may use poison to protect themselves (e.g. skunks, rattlesnakes).
 - Migration is an instinctive behavior where animals move when the seasons change. (Robins, monarch butterflies).
 - Hibernation is an instinctive behavior where the body systems of animals slow down to save energy during the cold winter (e.g., bats).
6. *Explain the relationship between living and non-living components in a system (food chain and food web).*
- All living things need energy from the sun in order to survive.
 - Energy in a food chain flows from the sun to producers and from producers to consumers.
 - A food chain shows the path of food from one living thing to another (e.g. corn plants which make their own food, a chicken eats the corn, the chicken lays an egg, and you eat the egg.) A food chain always begins with a producer.
 - Within a food chain there will be predators (an animal that hunts other animals, e.g., wolf) and prey (an animal that is hunted for food. e.g. rabbits).
 - Most animals eat many different things so most animals (including humans) are part of many food chains. Overlapping food chains are called food webs.
 - Within a food chain animals can be carnivores (meat eaters), herbivores (plant eaters), or omnivores (eating both plants and animals).
7. *Categorize parts of an ecosystem as either living or non-living and describe their rolls in the system.*
- Each living thing needs a certain environment. The environment includes living and non-living parts such as plants and animals and the sun's rays, water, air, and soil. All of these components of an environment interact with one another to form an ecosystem. The living parts depend on non-living parts. (e.g., trees need sunlight, air, soil, water). Living parts also depend on other living parts to survive (e.g., sea birds eat fish and then use trees to make their nests). An example of an ecosystem would be a desert.
 - A population is a group of organisms of the same kind that live in an ecosystem.
 - The place in an ecosystem where a population lives is called a habitat (e.g. canopy of the rainforest).
 - Ecosystems change over time by nature (floods, fires) and by people (building, cutting trees).

SUGGESTED ACTIVITIES:

Students will:

1. Compare/contrast living things and their processes (T-chart).
2. Use Venn diagram to compare and contrast life processes of living things.
3. Creative journal writing.
4. Art activity using clay to recreate the body parts of animals.
5. Grow plants in several areas of the classroom.
6. Celery Experiment; place celery in colored water and observe.
7. Illustrate and label plant parts.
8. Invent an animal, describing lifestyles
9. Complete home survey of inherited traits (develop into a pictograph).

ASSESSMENTS:

- ✧ Observations
- ✧ Diagrams
- ✧ Science journal
- ✧ Tests and quizzes
- ✧ Trivia games
- ✧ Rubrics
- ✧ Checklist

REMEDIATION:

- ✧ Partner work
- ✧ One-on-one attention
- ✧ Group work
- ✧ Small group instruction

ENRICHMENT:

- ✧ Independent animal research project
- ✧ Model various leaves through leaf rubbings and group by similarities.

10. Design comic strip of lifecycle of an amphibian.
11. Observe life cycle of a meal worm.
12. Monarch Migration Game.
13. Make a backbone using pipe cleaners, wagon wheel pasta, and soft life saver jelly rings. Alternate pasta and jelly rings on pipe cleaner.
14. Design a mural or diorama displaying habitats or ecosystems near school.
15. Make leaf rubbings and compare rubbings with other various leaves.
16. Use photos of animals and their young to discuss inherited traits.
17. Observe the life cycles of Painted Lady or Monarch butterflies.
18. Create food chains.
19. Dissect lima beans to explore what is inside a seed.
20. Explore animal adaptations with a mammal match-up activity.
21. PA animal scavenger hunt (use Yahoo!igans).
22. Explore food chains and predator/prey with a hawks and rabbits game.
23. Explore animal adaptations with Best Beak activity.
24. InstaLabs and Investigation activities in Harcourt Science series.

RESOURCES:

Harcourt

COURSE: Science	GRADE(S): 3 rd Grade
UNIT: Environment and Ecology (To be used in conjunction with Kettle Creek and Social Studies Units)	

<p>NATIONAL STANDARDS:</p> <p>SCIENCE THEMES: Systems and interactions, models, patterns of change, change over time.</p> <p>PROCESS SKILLS: Observing, classifying, measuring, analyzing and interpreting data, formulating hypotheses, predicting, experimenting/testing.</p>
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<p>STATE STANDARDS:</p> <p>3.3.4.D Identify changes in living things over time.</p> <ul style="list-style-type: none"> • Compare extinct life forms with living organisms. <p>4.1.4.A Identify various types of water environments.</p> <ul style="list-style-type: none"> • Identify the lotic system (e.g., creeks, rivers, streams). • Identify the lentic system (e.g., ponds, lakes, swamps). <p>4.1.4.B Explain the differences between moving and still water.</p> <ul style="list-style-type: none"> • Explain why water moves or does not move. • Identify types of precipitation. <p>4.1.4.C Identify living things found in water environments.</p> <ul style="list-style-type: none"> • Identify fish, insects and amphibians that are found in fresh water. • Identify plants found in fresh water. <p>4.1.4.D Identify a wetland and the plants and animals found there.</p> <ul style="list-style-type: none"> • Identify a wetland and the plants and animals found there. • Identify plants and animals found in wetlands. • Explain wetlands as habitats for plants and animals. <p>4.1.4.E Recognize the impact of watersheds and wetlands on animals and plants.</p> <ul style="list-style-type: none"> • Explain the role of watersheds in everyday life. • Identify the role of watersheds and wetlands for plants and animals. <p>4.2.4.A Identify needs of people.</p> <ul style="list-style-type: none"> • Identify plants, animals, water, air, minerals and fossil fuels as natural resources. • Explain air, water and nutrient cycles. • Identify how the environment provides for the needs of people. <p>4.2.4.B Identify products derived from natural resources.</p> <ul style="list-style-type: none"> • Identify products derived from natural resources. • Identify by-products of plants and animals. • Identify the sources of manmade products (e.g., plastics, metal, aluminum, fabrics, paper, and cardboard). <p>4.2.4.C Know that some natural resources have limited life spans.</p> <ul style="list-style-type: none"> • Identify renewable and nonrenewable resources used in the local community. • Identify various means of conserving natural resources. • Know that natural resources have varying life spans. <p>4.2.4.D Identify by-products and their use of natural resources.</p> <ul style="list-style-type: none"> • Understand the waste stream. • Identify those items that can be recycled and those that can not. • Identify use of reusable products. • Identify the use of compost, landfills and incinerators. <p>4.4.4.A Know the importance of agriculture to humans.</p> <ul style="list-style-type: none"> • Identify people's basic needs. • Explain the influence of agriculture on food, clothing, shelter and culture from one area to another.

- 4.4.4.B **Identify the role of the sciences in Pennsylvania agriculture.**

 - Know how people depend on agriculture.
 - Identify common animals found on Pennsylvania farms.
 - Identify common plants found on Pennsylvania farms.
 - Identify the parts of important agriculture related plants (i.e., corn, soybeans, barley).
- 4.4.4.C **Know that food and fiber originate from plants and animals.**

 - Define and identify food and fiber.
 - Identify what plants and animals need to grow.
 - Identify agricultural products that are local and regional.
 - Identify an agricultural product based on its origin.
 - Describe several products and tell their origins.
 - Describe the journey of a local agricultural product from production to the consumer.
- 4.4.4.D **Identify technology and energy use associated with agriculture.**

 - Identify the various tools and machinery necessary for farming.
 - Identify the types of energy used in producing good and fiber
 - Identify tools and machinery used in the production of agricultural products.
- 4.5.4.A **Know types of pests.**

 - Identify classifications of pests.
 - Identify and categorize pests.
 - Know how pests fit into a food chain.
- 4.5.4.B **Explain pest control.**

 - Know reasons why people control pests.
 - Identify different methods for controlling specific pests in the home, school and community.
 - Identify chemical labels (e.g., caution, poison, and warning).
- 4.5.4.C **Understand society's need for integrated pest management.**

 - Identify integrated pest management practices in the home.
 - Identify integrated pest management practices outside the home.
- 4.7.4.A **Identify differences in living things.**

 - Explain why plants and animals are different colors, shapes and sizes and how these differences relate to their survival.
 - Identify characteristics that living things inherit from their parents.
 - Explain why each of the four elements in a habitat is essential for survival.
 - Identify local plants or animals and describe their habitat.
- 4.7.4.B **Know that adaptations are important for survival.**

 - Explain how specific adaptations can help a living organism to survive.
 - Explain what happens to a living thing when its food, water, shelter or space is changed.
- 4.7.4.C **Define and understand extinction.**

 - Identify plants and animals that are extinct.
 - Explain why some plants and animals are extinct.
 - Know that there are local state laws regarding plants and animals.
- 4.8.4.A **Identify the biological requirements of humans.**

 - Explain how a dynamically changing environment provides for sustainability of living systems.
 - Identify several ways that people use natural resources.
- 4.8.4.B **Know that environmental conditions influence where and how people live.**

 - Identify how regional natural resources influence what people use.
 - Explain the influence of climate on how and where people live.
- 4.8.4.C **Explain how human activities may change the environment.**

 - Identify everyday human activities and how they affect the environment.
 - Identify examples of how human activities within a community affect the natural environment.
- 4.8.4.D **Know the importance of natural resources in daily life.**

 - Identify items used in daily life that come from natural resources.
 - Identify ways to conserve our natural resources.
 - Identify major land uses in the community.

4.9.4.A Know that there are laws and regulations for the environment.

- Identify local and state laws and regulations regarding the environment.
- Explain how the recycling law impacts the school and home.
- Identify and describe the role of a local or state agency that deals with environmental laws and regulations.

ASSESSMENT ANCHORS:

S4.B.3 Ecological Behavior and Systems

- S4.B.3.1 Identify and describe living and nonliving things in the environment and their interaction.
- S4.B.3.2 Describe, explain, and predict change in natural or human-made systems and the possible effects of those changes on the environment.
- S4.B.3.3 Identify or describe human reliance on the environment at the individual or the community level.

KEY CONCEPTS:

1. Agriculture plays a role in our society.
2. Pests affect our environment.
3. Humans are dependent upon and affect our environment.

UNIT OBJECTIVES:

1. *Identify types of pests.*
 - Types of biological plants and animals that compete with humans for resources (e.g., plants, such as, foxtail, mold, and purple loosestrife; animals such as zebra mussels, starlings, gypsy moth caterpillars, grubs).
2. Understand the importance of agriculture to humans.
 - Humans are dependent on the food and fiber systems from production to consumption for many products. (e.g., food, clothing, shelter products).
3. *Understand the role of sciences in improving agricultural practices.*
 - Science along with advances in technology has increased production and improved the quality and safety of products that consumers use.
 - People can use natural resources responsibly by practicing good conservation methods. Conservation is the wise use of natural resources. This includes the 3 R's; *Recycling, Reusing, Reducing.*
4. *Identify individual and community needs that are dependent on and impact the environment (driving, eating, industry, farming, littering).*
5. *Explain the impact of pollution on humans and the environment.*
 - There are many types of pollution including water, air, noise, and land (littering).
 - Pollution can cause a number of health concerns as well as global warming.
 - Humans can help protect the survival of species by conservation measures.
6. *Identify examples of environmental laws and regulations that exist to regulate the impact of humans on the environment.*
 - Local zoning regulations mandate land development standards.
 - State laws protect our area watersheds.
 - Hunting and fishing in Pennsylvania is regulated to promote a healthy and balanced ecosystem.

- The Clean Air Act, Clean Water Act, Recycling and Waste Reduction Act are examples of federal environmental laws and regulation.
- Incentives such as tax credits are used to encourage conservation of natural resources (e.g., the purchase of a hybrid car, using energy efficient building products when constructing homes).
- Anti-littering laws
- Emissions control laws
- Recycling regulations

7. *Participate in Kettle Creek classroom visit and follow up Kettle Creek field trip.*

- During the classroom visit and field trip the students will be introduced to a variety of local habitats that exist in the Pocono Mountain area. These include; forests, wetlands, and fields.
- Students will be given the opportunity to explore these habitats and discuss and discover some local plants and animals found there.
- Students will discuss a variety of ways which can be used to maintain a healthy, clean environment.

SUGGESTED ACTIVITIES:

Students will:

1. Pick up litter.
2. Class discussions, debates on environmental issues.
3. Write to government officials.
4. Kettle Creek classroom visit and field trip.
5. Recycling projects (making birdfeeders out of plastic soda bottles).
6. Discussion of the 3Rs.
7. Pollution Dilution activity to show effect of pollution on water.

RESOURCES:

Harcourt
Monroe County Conservation District

ASSESSMENTS:

- ✧ Teacher observations
- ✧ Journals
- ✧ Projects

REMEDIATION:

- ✧ Partner/Group Work
- ✧ One-on-one assistance
- ✧ Small group instruction

ENRICHMENT:

- ✧ Independent extension activities
- ✧ Webquests