

COURSE: Science	GRADE(S): 2 nd Grade
UNIT: Biology - Unit 1: Living Things	

<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, formulating hypotheses, predicting, experimenting/testing, variable recognition and control.</p>

<p>STATE STANDARDS:</p> <p><i>Indicated under Key Concepts In Column two of framework</i></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, 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"> Determine how different parts of a living thing work together to make the organism function. <p>4.6.4.A Understand that living things are dependent on nonliving things in the environment for survival.</p> <ul style="list-style-type: none"> Identify and categorize living and nonliving things. Describe the basic needs of an organism. Identify basic needs of plant and an animal and explain how their needs are met. Identify plants and animals with their habitat and food sources. Identify environmental variables that affect plant growth. Describe how animals interact with plants to meet their needs for shelter. Describe how certain insects interact with soil for their needs. Understand the components of a food chain. Identify a local ecosystem and its living and nonliving components. Identify a simple ecosystem and its living and nonliving components. Identify common soil textures. Identify animals that live underground. <p>4.7.4.A Identify differences in living things.</p> <ul style="list-style-type: none"> 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. <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>

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.

KEY CONCEPTS:

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. Living things change over time.

UNIT OBJECTIVES:

Students will:

1. *Differentiate between living, nonliving and extinct things*
 - Living things are alive.
 - Living things need food, water and oxygen, a gas in air and in water.
 - Living things grow and change.
 - Living things can also reproduce.
 - Animals and plants are living things.
 - Nonliving things do not need food, water and oxygen.
 - Water, air and rocks are nonliving things.
 - Extinct animals and plants were not able to survive in their environments and/or reproduce.
2. *Recognize the similarities and differences of living things.*
 - Plants need air, water, light from the Sun, and space to live and grow. Plants do not move from place to place.
 - Plants make their own food.
 - Plants get water from the ground.
 - Plants need space to grow.
 - Animals need food, water, air, space and shelter. Animals can move around.
 - Some animals eat plants, others eat other animals and many eat both plants and animals.
 - Some animals get water from the food they eat, others get water by drinking.
 - Animals need space for a home and to find food.
 - Animals need a shelter
3. *Identify parts of a plant and their roles.*
 - The root is the part of the plant that grows into the ground.
 - The root not only anchors the plant into the soil, but it also absorbs water and minerals.
 - The stem transports water and nutrients to the rest of the plant and also holds up the plant.
 - The leaves are the parts of the plant that are responsible for both converting sunlight into food through photosynthesis and respiration.
 - Flowers are structures responsible for producing seeds.
 - After flowers are pollinated, the flower turns into a fruit.
 - The fruit protects the seeds inside.
 - After the fruit ripens, it falls to the ground and the seeds inside have the opportunity to grow into new plants.
 - Fruit can decay and release the seeds or animals can eat the fruit and leave the seeds behind in a new place.
4. *Understand how plants change during their life cycle.*
 - Throughout their lives, plants and animals undergo a series of orderly and identifiable changes.

- All living things grow, change and die.
- The number of changes that a living thing goes through is its life cycle.
- All plants are not the same; they may have different life cycles.
- In many plant life cycles, a seed grows into a new plant that forms seeds. Then the new seeds repeat the life cycle.

5. *Understand how animals change during their life cycle.*

- Different kinds of animals grow in different ways. Their life cycles are different.
- Some animals, such as frogs and butterflies, go through distinct stages as they mature to adults. Other animals, such as deer, resemble their parents from birth to maturity and do not have distinct stages.
- An animal's life cycle shows that it hatches or it is born, grows into an adult, and has its own young, to begin the pattern again. For example, frogs begin as eggs in water. The eggs grow into tadpoles, tadpoles eventually become frogs, and adult frogs lay eggs to start the life cycle over again.

6. *Identify physical characteristics of animals and their functions and group by their external characteristics.*

- One group of animals is called mammals. Most mammals have hair or fur. They have lungs which help them breathe. Almost all mammals give birth to live young. The young drink milk from their mother's body.
- Birds are the only kind of animals that have feathers. They have wings to fly and lungs to breathe.. Birds have their young by laying eggs. They find food to feed their young.
- Reptiles such as snakes, lizards and turtles have scaly, dry skin.
- Many amphibians have smooth wet skin. Young amphibians hatch from eggs that are laid in the water. As adults they live on land.
- Fish live in water, have scales and gills. Gills help fish breathe.

SUGGESTED ACTIVITIES:

1. Illustrate five living things and five nonliving things on index cards.
2. Mix up index cards and redistribute having student classify by sorting into two groups- living things and nonliving things.
3. Provide students with a list of ten animals. Working in groups, students should identify the attributes that are common to the animals. Have students explain how they are different.
4. Using a Venn diagram compare and contrast the life cycles of different animals.
5. Students should summarize what they know about living, nonliving and extinct things.
6. Lab activity- place beans and gravel in a cup. Add water and observe for several days. Observe and explain what occurred.
7. Compare living things within a classroom to nonliving things.
8. Create a sequence chart illustrating the life cycle of an animal and/or plant.
9. Create a model of a plant
10. Observe the role of plant roots by placing a white carnation in water colored with food dye. Have students explain what was

ASSESSMENTS:

- ✧ Textbook series assessment
- ✧ Projects and participation in activities
- ✧ Supplemental assessments
- ✧ Journals
- ✧ Teacher quizzes and tests
- ✧ Observations
- ✧ Rubrics

REMEDIATION:

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

ENRICHMENT:

- ✧ Independent extension activities
- ✧ Invent an Animal/Plant (Teacher's Handbook – National Geographic Society)
- ✧ Prime Habitat (Teacher's Handbook – National Geographic Society)
- ✧ Investigating Endangered Species (Teacher's Handbook – National Geographic Society)
- ✧ Select an animal and illustrate the stages

<p>observed.</p> <ol style="list-style-type: none"> 11. Create a classroom mural of plants and animals in their natural habitat. 12. Label the parts of a plant 13. Identify and describe changes in a plant from flower (blossom) to fruit. 14. Compare and contrast life cycles of a frog and a butterfly. 15. Construct and interpret models/diagrams of animal and plant life cycles. 16. Describe the non-living components of an organism's surroundings, including water, space, and shelter. (Shelter may be living or non-living.) <p>RESOURCES:</p> <p>Harcourt Science 2006</p> <p><i>Websites:</i></p> <p>www.nationalgeographic.com/kids/activities http://animal.discovery.com www.animalplanet.com www.timeforkids.com www.discovery.com www.fi.edu www.kidsplanet.org www.kidsgowild.com</p> <p>RESOURCES:</p> <ul style="list-style-type: none"> • Animal Babies Series (by Rod Theodorou) • Heinemann Read and Learn Series Plants • Cycles of Life (by Carolyn Scrace) • Animals in Their Habitats (by Francine Galko) • Project Learning Tree • American Forest Foundation • Project Wild • Exploring Habitats – Creative Teaching Press • In a Nutshell by Joseph Anthony • Under One Rock by Anthony D. Fredericks • If You Were My Baby by Fran Hodgkins 	<p>of its life cycle.</p>
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COURSE: Science	GRADE(S): 2 nd Grade
UNIT: Biology - Unit 2: Environment	

<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, 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, react to environment). Describe basic needs of plants and animals. <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.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>4.2.4.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 and natural resources. Know that natural resources have varying life spans. <p>4.6.4.A Understand that living things are dependent on nonliving things in the environment for survival.</p> <ul style="list-style-type: none"> Identify and categorize living and nonliving things. Describe the basic needs of an organism. Identify basic needs of a plant and an animal and explain how their needs are met. Identify plants and animals with their habitat and food sources. Identify environmental variables that affect plant growth. Describe how animals interact with plants to meet their needs for shelter. Describe how certain insects interact with soil for their needs. Understand the components of a food chain. Identify a local ecosystem and its living and nonliving components. Identify a simple ecosystem and its living and nonliving components. Identify common soil textures. Identify animals that live underground. <p>4.6.4.C Identify how ecosystems change over time.</p> <p>4.7.4 A Identify differences in living things.</p> <ul style="list-style-type: none"> Explain why plants and animals are different colors, shapes and sizes and how these differences relate to their survival. <p>4.7.4.B Know that adaptations are important for survival.</p> <ul style="list-style-type: none"> 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. <p>4.9.4.A Know that there are laws and regulations for the environment.</p> <ul style="list-style-type: none"> 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.
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ASSESSMENT ANCHORS:

S4.B.1 Structure and Function of Organisms

S4.B.1.1 Identify and describe similarities and differences between living things and their life processes.

S4.B.2 Continuity of Life

S4.B.2.1 Identify and explain how adaptations help organisms to survive.

S4.B.2.2 Identify that characteristics are inherited and, thus, offspring closely resemble their parents.

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 affects 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.

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

S4.D.1.2 Identify the types and uses of Earth's resources.

ELIGIBLE CONTENT:

S4.D.1.2.2 Identify the types and uses of Earth materials for renewable nonrenewable, and reusable products (e.g., human-made products; concrete, paper, plastics, metal, fabrics, buildings, highways).

KEY CONCEPTS:

1. The Earth consists of a variety of ecosystems.
2. Humans are dependent upon and affect the environment.

UNIT OBJECTIVES:

Students will:

1. *Describe what makes up an environment.*
 - An environment is made up of all the things in a place. An environment has living things, such as plants and animals. An environment also has nonliving things, such as rocks and water.
 - The world has many kinds of environments. Different plants and animals live in each one.
 - Animals and plants may adapt to the environment where they live.
2. *Identify animal habitats*
 - A habitat is the part of an environment where a plant or an animal lives.
 - A habitat has everything a living thing needs to survive.
3. *Explain how an environment can change over time.*
 - Many things can change an environment.
 - The changes can be slow or fast- they can be good or bad. Fires, flooding, and/or droughts can cause changes to the environment.
 - Plants can change the environment by blocking light other plants need.
 - Insects can change the environment by causing harm to the resources of other animals.
 - People change the environment by building homes and roads.
 - People often change environments. Homes and roads are built within an environment. Some changes to the environment cause pollution.
4. *Identify types of pollution*

- Air pollution happens when harmful things, such as smoke and dust get into the air.
- Water pollution happens when harmful things, such as trash and oil get into the water.

5. *List ways to help the environment.*

- Reuse-resources last longer when you reuse.
- Recycle-A new object is made from old materials when you recycle.
- Reduce-You can use less of something.

SUGGESTED ACTIVITIES:

Students will:

1. Go on a nature walk and observe the environment. List the living and nonliving things observed during the walk.
2. Create a picture that shows what you need to live. Share all of the pictures in the class to identify the main needs of living things (food, water, shelter, space, and air).
3. Have student visualize a place where plants and animals live. Discuss what would the environment look, sound and smell like.
4. Have children find pictures of animals and ask them to describe the animals' habitat.
5. View before and after pictures indicating environmental change. Have students explain whether the change was good or bad.
6. Construct and interpret simple models of different kinds of habitats, including a forest and a stream.
7. Predict and describe seasonal changes in habitat and their effects on plants and animals. For example, how trees change through the seasons, and how animals respond to changes in the seasons?
8. Describe how animals are dependent on their surroundings. For example, how are squirrels and other animals affected by the loss of forest habitat?
9. Create posters promoting the three R's reduce, reuse and recycle.

RESOURCES:

Harcourt Science 2006

Websites:

- www.nationalgeographic.com/kids/activities
- <http://animal.discovery.com>
- www.animalplanet.com
- www.timeforkids.com
- www.discovery.com
- www.fi.edu

ASSESSMENTS:

- ✧ Textbook series assessment.
- ✧ Projects and participation in activities.
- ✧ Supplemental assessments.
- ✧ Journals
- ✧ Teacher quizzes and tests.
- ✧ Observations
- ✧ Rubrics

REMEDIATION:

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

ENRICHMENT:

- ✧ Independent extension activities.
- ✧ Prepare a presentation describing a habitat for a given animal.
- ✧ Create a booklet describing major types of local habitats.

www.kidsplanet.org
www.kidsgowild.com

RESOURCES:

"Animals in Their Habitats", by Francine Galko
Project Learning Tree
Project Wild
Exploring Habitats – Creative Teaching Press
"In a Nutshell", by Joseph Anthony
"Under One Rock", by Anthony D. Fredericks
"If You Were My Baby", by Fran Hodgkins

COURSE: Science	GRADE(S): 2 nd 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:

3.1.4.C Illustrate patterns that regularly occur and reoccur in nature.

- 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).

3.2.4.B Describe objects in the world using the five senses.

- Recognize observational descriptors from each of the five senses.
- Use observations to develop a descriptive vocabulary.

3.2.4.C Recognize and use the elements of scientific inquiry to solve problems.

- 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.

3.5.4.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.

4.2.4.A Identify needs of people.

- Identify how the environment provides for the needs of people.

ASSESSMENT ANCHORS:

S4.A.3 Systems, Models and Patterns
S4.A.3.3 Identify and make observations about patterns that regularly occur and reoccur in nature.

S4.B.3 Ecological Behavior and Systems
S4.B.3.3 Identify or describe human reliance on the environment at the individual or the community level.

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

ELIGIBLE CONTENT:

S4.A.3.3.1 Identify and describe observable patterns (e.g., growth patterns in plants, weather, water cycle).

S4.A.3.3.2 Predict future conditions/events based on observable patterns (e.g., day/night, seasons,

sunrise/sunset, lunar phases).

KEY CONCEPTS:

1. Weather changes in patterns over time.
2. The Sun's heat causes water to change form and move.
3. Weather conditions can be measured and predicted.

UNIT OBJECTIVES:

Students will:

1. *Recognize that the Earth's weather changes continuously, from day to day.*
 - We live and breathe in a blanket of air known as the atmosphere.
 - The atmosphere is constantly moving and changing all around the earth.
2. *Explain that changes in the weather are characterized by daily differences in wind, temperature, and precipitation.*
 - Precipitation is water that falls from the clouds in the sky. It is part of a continuous cycle of water that falls to the earth, and then is heated by the sun and evaporates into the air again to form clouds.
 - Wind is moving air. It can move in different directions.
 - Temperature is how warm or cool something is.
3. *Illustrate how precipitation occurs when water, previously evaporated, condenses out of the air and changes state from a gas to a liquid (rain), or to a solid (snow and sleet).*
 - The process of water moving from the Earth to the sky and back again is known as the Water Cycle.
4. *Identify that too little or too much precipitation, can result in droughts or floods.*
 - During a drought the weather may be hotter than usual. The land may get very dry with streams and ponds drying up. Soil may blow away with the wind.
 - Floods can result from a lot of rain. Rivers and streams may overflow.
5. *Know that storms have powerful winds, which may be accompanied by rain, snow, or other kinds of precipitation.*
 - Storms are a kind of weather that can be harmful.
6. *Describe how weather data is collected and recorded using instruments. This information is very useful for predicting weather and determining weather patterns.*
 - Scientists use tools to measure the weather.
 - A thermometer measures temperature
 - An anemometer measures the speed of wind.
 - Precipitation can be measured with a rain gauge.
7. *Give examples of how weather influences human activity.*

SUGGESTED ACTIVITIES:

1. Harcourt – Investigates and InstaLabs
2. Observe and describe types of precipitation including rain, snow, and ice (sleet and hail).
3. Observe and describe precipitation in terms of evaporation and condensation of water.
4. Observe and record daily weather conditions, such as sunny, cloudy, windy, rainy, or snowy.

ASSESSMENTS:

- ✧ Textbook series assessment.
- ✧ Projects and participation in activities.
- ✧ Supplemental assessments.
- ✧ Journals
- ✧ Teacher test/quizzes.

5. Describe weather in terms of temperature, wind, and precipitation.
6. Measure and record weather data using weather instruments including a thermometer, rain gauge, and weather vane (standard English and metric measures).
7. Record and interpret daily temperature using a graph with numbered axes.
8. Observe and describe seasonal weather patterns and local variations.
9. Illustrate/make a model of the stages of the water cycle.
10. Create a booklet that indicates human activities during different weather.

RESOURCES:

Harcourt Science 2006

Websites:

www.fi.edu

www.weatherwizkids.com

www.echokids.ca

www.edheads.org

RESOURCES:

- Rookie Read-About Science Weather Series Children's Press
- Heinemann, "What is Weather?"
- Project Wild
- Pest Patrol Penn State University
- Dig In! NSTA press
- Aims Activities

REMEDIATION:

- ✧ Peer support.
- ✧ Modified instruction.
- ✧ Small group instruction.

ENRICHMENT:

- ✧ Harcourt Independent Inquiry Unit – Going in Circles
- ✧ Leveled Independent Science Books
- ✧ Oral Presentations
- ✧ Develop a weather newscast

COURSE: Science	GRADE(S): 2 nd Grade
UNIT: Earth Science - Unit 2: Seasonal Changes	

<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, formulating hypotheses, predicting, experimenting/testing, variable recognition and control.</p>

<p>STATE STANDARDS:</p> <p>3.1.4.C Illustrate patterns that regularly occur and reoccur in nature.</p> <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). <p>3.5.4.C Know basic weather elements.</p> <ul style="list-style-type: none"> Explain how the different seasons affect plants, animals, food availability and daily human life. <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>4.4.4.C Know that food and fiber originate from plants and animals.</p> <ul style="list-style-type: none"> 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. <p>ASSESSMENT ANCHORS:</p> <p>S4.A.3 Systems, Models and Patterns S4.A.3.3 Identify and make observations about patterns that regularly occur and reoccur in nature.</p> <p>S4.B.2 Continuity of Life S4.B.2.1 Identify and explain how adaptations help organisms to survive.</p> <p>S4.D.2 Weather, Climate and Atmospheric Processes. S4.D.2.1 Identify basic weather conditions and how they are measured.</p> <p>ELIGIBLE CONTENT:</p> <p>S4.A.3.3.1 Identify and describe observable patterns (e.g., growth patterns in plants, weather, water cycle).</p> <p>S4.A.3.3.2 Predict future conditions/events based on observable patterns (e.g., day/night, seasons, sunrise/sunset, lunar phases).</p> <p>S4.B.2.1.1 Identify characteristics for plant and animal survival in different environments (e.g., wetland, tundra, desert, prairie, deep ocean, forest).</p> <p>S4.B.2.1.2 Explain how specific adaptations can help a living organism survive (e.g., protective coloration, mimicry, leaf sizes and shapes, ability to catch or retain water).</p>

UNIT OBJECTIVES:

Students will:

1. *Describe how weather in many places changes with the seasons and that the seasons repeat every year.*
 - The year is divided into seasons, or sets of consecutive months that have similar weather patterns and length of days.
 - There are four seasons in many parts of the world: winter, spring, summer, and fall (also called autumn).
 - Other parts of the world have two seasons: wet and dry.
 - Seasons happen in the same cycles year after year and that different types of weather occur during different seasons.
 - Winter is the coldest season.
 - Though temperatures and amount of precipitation varies across different areas, winter typically has lower temperatures than the rest of the year.
 - Snow, sleet, hail, and rain are common forms of precipitation in the winter.
 - December, January, and February are considered winter months in the northern hemisphere, though some countries acknowledge November to be part of winter.
 - As the winter ends, spring begins and temperatures slowly rise as the days get longer.
 - Snow and ice melt and more rain tends to fall during this season.
 - The United States marks the beginning of spring with the vernal equinox in March and the end of spring with the summer solstice in June.
 - After spring, is summer, which begins in June and ends around September in the United States.
 - Summer is the warmest season and has the longest days.
 - Most areas receive the least amount of precipitation during this season.
 - As summer ends, the weather gets cooler again and the days get shorter.
 - Fall (autumn) begins in September and ends in November in the United States.
2. *Explain how living things respond to weather and seasonal changes.*
 - In snowy areas, many animals have difficulties finding food and some will even hibernate to conserve energy.
 - During winter they may wear different clothing like coats, hats, and scarves and participate in different activities, such as, sledding or skiing.
 - Changes in the seasons cause living things to change.
 - During the spring, flowers and plants grown and bloom and animals become active again. Many animals will have their young in the spring when food is plentiful. Furthermore, their young will have time to grow before experiencing a cold winter themselves.
 - During the summer months, food is often abundant due to the growth of a wide variety of plants, vegetables and fruits and berries.
 - In the fall, leaves of some trees will turn colors and fall off.
 - Some plants bear fruit, such as, apple trees.
 - Some animals will begin to migrate, or move to warmer areas for the coming winter. Other animals will store and eat food to prepare for hibernation or dormancy.
 - In the winter, food may be hard to find in some areas.
 - In snowy areas, many animals have difficulties finding food and some will even hibernate to conserve energy.
 - Some animals may change how they look by growing thicker coats in the fall and the winter. Some may have a change in color of their fur to provide them with protection from predators.
3. *Understand how adverse conditions of weather may slow the growth and development of plants and animals (**dormancy**), whereas optimal weather conditions may accelerate the growth and development of plants and animals.*
 - Droughts, flooding, and extreme heat or cold can negatively affect the growth of plants.

- Poor vegetation can cause animals to experience health problems related to poor nutrition.
4. *Identify how seasonal changes affect the activities of people within the local community.*
- During winter people may wear different clothing like coats, hats, and scarves and participate in different activities, such as, sledding or skiing.
 - In spring, people may wear lighter coats, rain gear and begin outdoor activities like baseball, softball, or gardening.
 - In summer, people may wear shorts, skirts, shirts, hats, and sunglasses and go swimming or take a vacation. The sun stays high in the sky during the summer and it may be necessary to use a sunscreen and stay covered and cool.
 - Football is a common fall sport in many schools and community programs during the fall, In fall, people may wear coats and sweaters.

SUGGESTED ACTIVITIES:

Students will:

1. Harcourt unit lab activities.
2. Identify growth and behavioral responses of plants and animals to weather and seasonal changes. Examples of responses that are adaptive include migration, hibernation, and dormancy.
3. Research animals that migrate, hibernate, or show other changes throughout the seasons or in the presence of adverse environmental conditions.
4. Evaluate the usefulness of camouflage in an animal's habitat (for example, coloration patterns in frogs).
5. Compare and contrast the responses of plants and animals to weather and seasonal changes.
6. Children can engage in many different types of art activities that focus on the seasons. They can draw or paint various pictures of a single scene, showing how it changes with the seasons. They can do pictures or paintings of their favorite activities during each season or of different seasonal holidays.
7. Write poems and stories about the seasons. One possible topic is "My Favorite Season." Children could also write about the different types of things they do as the seasons change
8. Describe how the weather changes with the seasons and how these changes affect what they wear.
9. Make a list of the different flowers that appear in spring, in summer, and in autumn.

RESOURCES:

Harcourt Science 2006

ASSESSMENTS:

- ✧ Textbook series assessment.
- ✧ Projects and participation in activities.
- ✧ Supplemental assessments.
- ✧ Journals
- ✧ Teacher tests/quizzes.

REMEDIATION:

- ✧ Peer Support
- ✧ Modified Instruction
- ✧ Small Group Instruction

ENRICHMENT:

- ✧ Harcourt independent inquiry unit.
- ✧ Leveled independent science books.
- ✧ Oral Presentations on topic.
- ✧ Develop a travel brochure illustrating local seasonal attractions.

Websites:

<http://www.unitedstreaming.com/search/assetDetail.cfm?guidAssetID=333BED24-C0CB-4CF5-BD56-32B183CB73AE>

Magical Mother Nature: The Four Seasons

From the snows of winter to the first flowers of spring, from joyous summer days to cool autumn nights, children see the wonder and magic of our changing seasons. Youngsters will gain a better understanding of how important the changing of the seasons are to their world. They will see that weather changes occur each season and how these changes affect their lives and community. Animals and plants have to adapt to each season and this aspect of seasonal change is also explored. Best of all, each season brings its own special holidays. Beautiful imagery captures all this wonder and magic

www.fi.edu

www.weatherwizkids.com

www.echokids.ca

www.edheads.org

COURSE: Science	GRADE(S): 2 nd Grade
UNIT: Earth Science - Unit 3: Earth's Natural Resources	

<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, formulating hypotheses, predicting, experimenting/testing, variable recognition and control.</p>

<p>STATE STANDARDS:</p> <p>3.5.4.A Know basic landforms and earth history.</p> <ul style="list-style-type: none"> 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 type of environment they lived in (e.g., tropical, aquatic, desert). <p>3.5.4.B Know types and uses of earth materials.</p> <ul style="list-style-type: none"> 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). <p>3.5.4.D Recognize the earth's different water resources.</p> <ul style="list-style-type: none"> 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). <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 made from trees. 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>4.4.4.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. Know how people depend on agriculture. <p>4.4.4.B Identify the role of the sciences in Pennsylvania agriculture.</p> <ul style="list-style-type: none"> Identify common animals found on Pennsylvania farms. Identify common plants found on Pennsylvania farms. Identify the parts of important agricultural related plants (i.e., corn, soybeans, barley) Identify a fiber product from Pennsylvania farms.
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- 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 food 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, 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.

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.B.3 Ecological Behavior and Systems**
- S4.B.3.2 Describe, explain, and predict change in natural or human-made systems and the possible affects 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.
- S4.D.1 Earth Features and Processes that Change Earth and Its Resources**
- S4.D.1.1 Describe basic landforms in Pennsylvania.
- S4.D.1.2 Identify the types and uses of Earth's resources.
- S4.D.1.3 Describe Earth's different sources of water or describe changes in the form of water.

ELIGIBLE CONTENT:

- S4.A.3.2.1** Identify what different models represent (e.g., maps show physical features, directions, distances; globes represent Earth; drawings of watersheds depict terrain; dioramas show ecosystems; concept maps show relationships of ideas).
- S4.A.3.2.2** Use models to make observations to explain how systems work (e.g., water cycle, sun-Earth-moon system).
- S4.A.3.2.3** Use appropriate, simple modeling tools and techniques to describe or illustrate a system (e.g., two cans and string to model a communications system, terrarium to model an ecosystem).
- S4.B.3.2.1** Describe what happens to a living thing when its habitat is changed.
- S4.B.3.2.2** Describe and predict how changes in the environment (e.g., fire, pollution, flood, building dams) can affect systems.
- S4.B.3.2.3** Explain and predict how changes in seasons affect plants, animals, or daily human life (e.g., food availability, shelter, mobility).

KEY CONCEPTS:

1. Earth provides a variety of resources.
2. Resources are renewable and nonrenewable.
3. Agriculture plays a role in society.
4. Pests affect our environment.

UNIT OBJECTIVES:

Students will:

1. *Identify water, land, and air as natural resources.*
 - Natural resources are useful materials that come from Earth.
 - Water, both fresh and salt, is a natural resource that covers most of the Earth. Water is a natural resource that plants, animals and people need to live.
 - Land is a natural resource that includes soil, rocks and sand. Soil is used for growing plants (crops). Rocks can be used to make buildings. Sand is used to make glass.
 - Air is a natural resource needed for all living things. People and animals breathe air.
2. *Understand that the surface of the Earth is composed of different materials that are also natural resources.*
 - Rocks are natural resources that can have many shapes, sizes and colors.
 - Sand is made up of tiny pieces of rock broken off larger rocks by wind, rain and ice.
 - Rocks are made of minerals.
 - Soil is a natural resource which covers most of the land. Soil is a mixture of clay, sand, and humus. Soil is a naturally occurring mixture of organic matter. (Dirt is soil that is out of place, such as mud on shoes tracked on the kitchen floor.) Soil can be different, and plants need the right kind of soil to grow.
3. *Classify which products can be reused or recycled.*
 - Some natural resources, such as oil and coal, cannot be replaced. Others, such as trees, can be replaced.
 - Sunlight, water and air can never be used up.
4. *Understand conservation of resources.*
 - People cut down trees, and new trees can be replanted to replace cut trees.
 - Forests are always changing; wind and fire can kill trees, which grow back over time.
 - When people build on land, plants and animals lose their homes.
 - A refuge is a safe place for plants and animals to live.
5. *Identify agricultural products and processes.*
 - Plants are natural resources
 - Machines improve what people get from crops by helping in planting and harvesting.
 - Plants are used to build homes, to make clothes, to make food, and to make paper.
 - Most food come from farms either directly as crops or as the animals that eat the crops
 - Local agricultural products include plants such as corn, tomatoes, pumpkins and many other vegetables. Tree farming is also popular with farmers planting and selling pine trees for Christmas. Cotton is a plant grown in warmer climates.
 - To grow well, plants need enough warmth, light and water. Crop must be protected from weeds and pests.
 - A crop that is fine when harvested may spoil before it gets to consumers.
6. *Identify types of pests.*
 - Pests are living things that damage or destroy many natural resources. For instance, Gypsy moths destroy the leaves on trees and can be responsible for the death of a large number of trees. Other insects cause extreme damage to farm crops. This results in a loss of

agricultural products for people to purchase/consume. Mice are pests that can get into people's homes. Once in a home they can cause problems by eating and soiling food items. Some pests take over a habitat and make it unlivable for other plants or animals.

SUGGESTED ACTIVITIES:

Students will:

1. Create posters/collages/booklets of natural resources.
2. Collect and investigate samples of clay, silty and sandy soil.
3. Differentiate between soil and dirt.
4. Conduct an experiment with growing conditions by planting seeds in various types of soil.
5. Extend the over activity to include experiment variables such as light and water.
6. Classify natural resources as renewable or nonrenewable.
7. Research and present information on a self selected agricultural product.
8. Brainstorm ways to protect farmer's crops from pests.

RESOURCES:

Harcourt Science

Websites:

<http://www.unitedstreaming.com/search/assetDetail.cfm?guidAssetID=09F468A8-095F-475A-A077-0A1CA7DDB3E4>

When I Grow Up I Want To Be a Farmer

What do fruits and vegetables, trees, cows, and fish all have in common? Farmers produce them all! Through the experiences of a 10-year-old spending a day with a farmer, children will gain a better understanding of all the different skills needed to become a successful farmer, including the science and math behind planting crops and keeping animals healthy; how good reading and writing skills help farmers stay organized; and the important part teamwork plays in the processes of planting, harvesting, and finally selling their product. Children will also learn different vocabulary terms, including agriculture, cultivation, and farming. At the end of this program, children will not only have a greater appreciation of the hard work and dedication of the farmer, they will also learn what a vital role farmers play in providing us with food, shelter, and clothing.

What do fruits and vegetables, trees, cows, and fish all have in common? Farmers produce them

ASSESSMENTS:

- ✧ Textbook series assessment.
- ✧ Teacher tests/quizzes.
- ✧ Projects and participation in activities.
- ✧ Supplemental assessments.
- ✧ Journals

REMEDIATION:

- ✧ Peer support.
- ✧ Modified instruction.
- ✧ Weather rhythm.
- ✧ Small group instruction.

ENRICHMENT:

- ✧ Harcourt independent inquiry unit.
- ✧ Leveled independent science books.
- ✧ Create and present a newscast alerting the public of the problems associated with an agricultural pest.

all! Through the experiences of a 10-year-old spending a day with a farmer, children will gain a better understanding of all the different skills needed to become a successful farmer, including the science and math behind planting crops and keeping animals healthy; how good reading and writing skills help farmers stay organized; and the important part teamwork plays in the processes of planting, harvesting, and finally selling their product. Children will also learn different vocabulary terms, including agriculture, cultivation, and farming. At the end of this program, children will not only have a greater appreciation of the hard work and dedication of the farmer, they will also learn what a vital role farmers play in providing us with food, shelter, and clothing.

- Pest Patrol Penn State University
- Dig In! NSTA press
- Aims Activities

COURSE: Science	GRADE(S): 2 nd Grade
UNIT: Physical Science - Unit 1: Chemistry	

<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, formulating hypotheses, predicting, experimenting/testing, variable recognition and control.</p>

<p>3.4.4.A Recognize basic concepts about the structure and properties of matter.</p> <ul style="list-style-type: none"> • Describe properties of matter (e.g., hardness, reactions to simple chemical tests). • Know that combining two or more substances can make new materials with different properties. • Know different material characteristics (e.g., texture, state of matter, solubility). <p>ASSESSMENT ANCHORS:</p> <p>S4.C.1 Structure, Properties, and Interaction of Matter and Energy. S4.C.1.1 Describe observable physical properties of matter.</p>
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<p>KEY CONCEPTS.</p> <p>1. Matter is identified by specific properties.</p> <p>UNIT OBJECTIVES:</p> <p><i>Students will:</i></p> <ol style="list-style-type: none"> 1. <i>Understand that all common substances are made of matter.</i> <ul style="list-style-type: none"> • Matter is anything that has mass and takes up space. 2. <i>Recognize that matter most commonly occurs in three states: solids, liquids, and gases.</i> <ul style="list-style-type: none"> • Matter can be a solid, liquid or gas. These kinds of matter are called the states of matter. • A solid has its own size and shape, takes up space and has mass. • A liquid does not have its own shape. A liquid takes the shape of its container. Liquids take up space and have mass. • Gas does not have its own shape; it takes the size and shape of its container and always fills the space inside its container. • Matter can change from one state to another. 3. <i>Explain that matter can be changed and different matter changes in different ways.</i> <ul style="list-style-type: none"> • Matter can be changed in many ways, including its size and shape. • Molding, folding, tearing, and bending can change solid matter. • Matter can be changed through heating and cooling. • Heat can change solids to liquids through a process called melting. • Heat can change liquids to gases through a process called evaporation. • Liquids can turn to solids through a process called freezing. • Gases can turn to liquid through a process condensation. 4. <i>Describe properties of objects (e.g., hardness, size, texture, color)</i> <ul style="list-style-type: none"> • A property is something that can be observed with the senses. • Properties of matter include color, shape, size, weight, and feel.
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- Objects can be described, classified, and compared their physical properties.

SUGGESTED ACTIVITIES:

Students will:

1. Harcourt Unit Insta- Labs and Activities
2. Classify materials as to whether they are liquids, solids, or gases.
3. Explore physical changes of matter through various activities designed to allow students to change the shape, size and/or color of a substance such as modeling clay.
4. Examine and describe the transformation of matter from one state to another.
5. Demonstrate the effect of heating and cooling on various substances- water, ice cream, chocolate bars.
6. Describe and identify example of condensation, evaporation, melting, freezing of water.
7. Describe the physical properties of displayed objects.

RESOURCES:

Harcourt Science 2006

Websites:

<http://www.chemistry.org/portal/a/c/s/1/wondernetdisplay.html?DOC=wondernet\index.html>

<http://www.chemistry.org/portal/a/c/s/1/acsdisplay.html?DOC=education%5Cwande%5Cresourcechem.html>

<http://www.chemistry.org/portal/a/c/s/1/acsdisplay.html?DOC=kids\index.html>

United Streaming Videos

<http://www.unitedstreaming.com/search/assetDetail.cfm?guidAssetID=83A4FF97-57E2-4073-96C5-ED75AC5223CD>

Properties of Matter, Part 2: Liquids, Solids and Gases

Description:

Matter is everywhere—in everything! Appropriate examples and experiments make learning about matter fun and easy to follow. Learn that all matter has mass and takes up space, use the five senses to discover the properties of matter, and see how matter changes form. A catchy tune helps solidify important concepts.

ASSESSMENTS:

- ✧ Teacher tests and quizzes.
- ✧ Textbook series assessment.
- ✧ Projects and participation in activities.
- ✧ Supplemental assessments.
- ✧ Journals

REMEDICATION:

- ✧ Peer mediation
- ✧ Small group instruction
- ✧ Modified instruction

ENRICHMENT:

- ✧ Leveled independent science books.
- ✧ Design, complete and present the results of an experiment indicating the time needed for frozen substances to melt at room temperature.

COURSE: Science	GRADE(S): 2 nd Grade
UNIT: Physical Science - Unit 2: Energy	

<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, formulating hypotheses, predicting, experimenting/testing, variable recognition and control.</p>
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<p>STATE STANDARDS:</p> <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.E Recognize change in natural and physical systems.</p> <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. <p>3.4.4.B Know basic energy types, sources and conversions.</p> <ul style="list-style-type: none"> Identify energy forms and examples (e.g., sunlight, heat, stored, motion). Know the concept of the flow of energy by measuring flow through an object or system. Describe static electricity in terms of attraction, repulsion and sparks. Apply knowledge of the basic electrical circuits to design and construct simple direct current circuits. Classify materials as conductors and nonconductors. Know and demonstrate the basic properties of heat by producing it in a variety of ways. Know the characteristics of light (e.g., reflection, refraction, absorption) and use them to produce heat, color or virtual image. <p>3.4.4.C Observe and describe different types of force and motion.</p> <ul style="list-style-type: none"> 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). <p>ASSESSMENT ANCHORS:</p> <p>S4.C.1 Structure, Properties, and Interaction of Matter and Energy S4.C.1.1 Describe observable physical properties of matter.</p> <p>S4.C.2 Forms, Sources, Conservation, and Transfer of Energy S4.C.2.1 Recognize basic energy types and sources, or describe how energy can be changed from one form to another.</p> <p>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.</p>
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KEY CONCEPTS:

1. Energy has different forms and comes from a variety of sources

UNIT OBJECTIVES:

Students will:

1. *Define Energy*
 - Anything that can do work and cause change has energy
 - Energy is neither made nor destroyed, but can be changed from one form to another and back.
2. *Identify basic forms of energy*
 - Energy comes in a lot of different forms and one type of energy often gets changed into another.
 - Heat, light, and sound are three forms of energy.
 - Heat is energy that makes things warmer.
 - Light is energy that lets you see.
 - Sound is energy that you can hear.
3. *Recognize sources of energy*
 - Almost all energy on Earth comes from the Sun.
 - Energy from the sun is call solar energy.
 - Energy can also come from the wind, and moving water.
 - Fuels, such as coal and oil are sources of energy.
 - Wind, water, fuel and solar energy are used to produce electricity which is another form of energy.

SUGGESTED ACTIVITIES:

1. Create a poster illustrating a form of energy.
2. Compare and contrast different energy sources (flashlight, lamp, fire, sun).
3. Energy in the form of electricity is used to do all kinds of work. Ask students to identify some of the work electricity enables us to do. List students' answers on the chalkboard.
4. Make wind socks designed with illustrations of energy sources.
5. Demonstrate how wind moves items by directing and releasing the air in a blown up balloon into a pile of torn paper scraps.

RESOURCES:

Harcourt Science 2006

WEBSITES:

United Streaming Videos
<http://www.unitedstreaming.com/search/assetDetail.cfm?guidAssetID=84205544-D458-491F-9DBA-DD72854571E6>

ASSESSMENTS:

- ✧ Teacher tests/quizzes.
- ✧ Textbook series assessment.
- ✧ Projects and participation in activities.
- ✧ Supplemental assessments.
- ✧ Journals

REMEDIATION:

- ✧ Peer mediation.
- ✧ Small group instruction.
- ✧ Modified instruction.

ENRICHMENT:

- ✧ Leveled independent science books.
- ✧ Oral presentations.
- ✧ Create a poem describing the importance of a source of energy.
- ✧ Create a 10 question quiz covering the important facts found in the unit.

Exploring Electricity and Magnetism

Exploring Science Series "Exploring Science" is a six-video series that follows the exploits of Bo and Vincent, frequently joined by their friends, Celeste and Charlene, as they learn about the world around them. Exploring Electricity and Magnetism -- Bo, Vincent and Charlene explore uses of electricity and characteristics of magnets, demonstrating the north and south poles and how they attract and repel one another.

<http://www.unitedstreaming.com/search/assetDetail.cfm?guidAssetID=1A80881B-9024-492A-AD73-A9B5DF81E60D>

Exploring Heat and Light

Exploring Science Series "Exploring Science" is a six-video series that follows the exploits of Bo and Vincent, frequently joined by their friends, Celeste and Charlene, as they learn about the world around them. Exploring **Heat** and **Light** -- The young scientists look at the concepts of **Heat** and **Light**, as well as the parts of our bodies that sense these phenomena. They also learn about reflection, shadows, and temperature.

COURSE: Science	GRADE(S): 2 nd Grade
UNIT: Physical Science - Unit 3: Force, Motion, and Magnetism	

<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, formulating hypotheses, predicting, experimenting/testing, variable recognition and control.</p>

<p>STATE STANDARDS:</p> <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.E Recognize change in natural and physical systems.</p> <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. <p>3.4.4.C Observe and describe different types of force and motion.</p> <ul style="list-style-type: none"> • 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). <p>ASSESSMENT ANCHORS:</p> <p>S4.C.3 Principles of Motion and Force</p> <p>S4.C.3.1 Identify and describe different types of force and motion, or the effect of the interaction between force and motion</p>

<p>KEY CONCEPTS:</p> <ol style="list-style-type: none"> 1. Forces cause objects to move in different ways. 2. Tools, simple machines and materials can be used safely to solve problems. <p>UNIT OBJECTIVES:</p> <p><i>Students will:</i></p> <ol style="list-style-type: none"> 1. <i>Explain how objects exhibit different kinds of motion (straight, circular, back and forth).</i> <ul style="list-style-type: none"> • <i>An object is in motion when it is moving.</i> • <i>Objects can move in different ways.</i> 2. <i>Describe how the amount and direction of the force exerted on an object (for example, push, pull, friction, and gravity) determines how much the object will move.</i> <ul style="list-style-type: none"> • <i>A force is a push or a pull that makes something move.</i> • <i>An object's motion can be changed by a force.</i>
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- A stronger force makes an object move farther.
- More force is needed to make a heavier object move as far as a lighter object.
- A force changes the way an object moves.
- An object moves faster when you apply more force.
- Gravity is a force that pulls things down.
- Gravity keeps you on Earth's surface.
- The force that makes objects slow down and stop is called friction.
- Friction causes heat.

3. *Recognize that work is done when force moves an object.*

- Work is done when a force is used to move an object.
- No work is done if an object does not move.

4. *Explain how machines can make work easier.*

- A tool that makes work easier is a machine.
- A simple machine has few or no moving parts.

5. *Summarize that objects may be moved by being pushed and pulled with magnets.*

- Magnets are object that can push or pull some metals.
- A magnet attracts metal when it pulls the metal toward itself.
- A magnet repels metal when it pushes the metal away.

SUGGESTED ACTIVITIES:

Students will:

1. Describe or compare motions of common objects in terms of speed and direction using appropriate terms such as speed words: *fast, slow, faster, slower* and direction words: *east, west, north, south, right, left, up, down*.
2. Demonstrate how forces (pushes or pulls) are needed to speed up, slow down, stop, or change the direction of a given object.
3. Observe simple machines within the classroom (pencil sharpener, stapler, and paper dispenser) and describe how they change the effort needed to complete a task.
4. Predict which materials will be attracted to magnets, test the predictions, and create a chart that shows the results.
5. Classify materials as to whether they are attracted to magnets or not.
6. Compare natural magnets (lodestone or magnetite) and artificial magnets.
7. Identify the north and south magnetic poles of magnets.
8. Conduct an investigation to determine how the different poles of magnets react to the poles of other magnets.
9. Use magnetic compasses to determine directions of north and south poles.
10. Identify important applications of magnets in everyday life such as, refrigerator magnets and chalkboard letters, toys, door latches,

ASSESSMENTS:

- ✧ Teacher test and quizzes.
- ✧ Textbook series assessment.
- ✧ Projects and participation in activities.
- ✧ Supplemental assessments.
- ✧ Journals

REMEDIATION:

- ✧ Peer mediation
- ✧ Small group instruction
- ✧ Modified instruction

ENRICHMENT:

- ✧ Leveled independent science books.
- ✧ Research the history of the magnet and create a timeline.

paper clip holder.

11. Create a new application for using a magnet.

RESOURCES:

Harcourt Science 2006

WEBSITES:

United Streaming Videos

<http://www.unitedstreaming.com/search/assetDetail.cfm?guidAssetID=CD98BCE9-269E-4E88-9BCC-3111A0178509>

Junior Electrician: Magnetism

Magnets are shown, discussed, and demonstrated. The relationship between magnets and electricity are presented. The program traces the history of the magnet from early Greeks discovering the lodestone to the use of magnetism in the generation of electricity. Properties of magnetism are demonstrated. The relationship between magnetism and electricity is explored.

K-nex