

# **Tri-District Science Curriculum 2011 Grades K - 5**



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# SCIENCE CURRICULUM

## KINDERGARTEN - FIVE SENSES

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### STATE STANDARD

- 5.1.P.A.1** Display curiosity about science objects, materials, activities, and longer term investigations in progress.
- 5.1.P.B.1** Observe, question, predict and investigate materials, objects, and phenomena (e.g. using simple tools to crack a nut and look inside) during indoor and outdoor classroom activities and during any longer term investigations.
- 5.1.P.B.2** Using basic science terms, and topic related science vocabulary.
- 5.1.P.B.3** Identify and use basic tools and technology to extend exploration in conjunction with science investigations.
- 5.1.P.C.1** Communicate with other children and adults to share observations, pursue questions, and make predictions, and/or conclusions.
- 5.1.P.D.1** Represent observations and work through drawing, recording data, and “writing”.

### BIG IDEAS/COMMON THREADS

Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.

### ENDURING UNDERSTANDINGS

Scientific exploration requires an understanding of skills and strategies.

### ESSENTIAL QUESTIONS

What skills and strategies are needed for scientific exploration?

### MODULE ASSESSMENT

Identify basic scientific tools and what they're used for.

Use appropriate vocabulary words.

Make observations to generate predictions, and conclusions.

### LESSON OBJECTIVES

Students will be able to...

- identify the five senses.
- use simple tools for scientific exploration.
- make observations and predictions using scientific vocabulary.
- generate observations using pictures, words and data.
- participate in discussions about observations, ideas and conclusions.

## **MODULE SKILLS**

Students will be able to...

- use basic science terms and appropriate vocabulary to communicate ideas.
- utilize basic tools and technology.
- use their senses to make detailed and accurate observations.

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# SCIENCE CURRICULUM

## KINDERGARTEN – SOLIDS AND LIQUIDS

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### STATE STANDARD

- 5.2.P.A.1** Observe, manipulate, sort and describe objects and materials (e.g. water, sand, clay, paint, glue, various types of blocks, collections of objects, simple household items that can be taken apart or objects made of wood, metal, or cloth) in the classroom and outdoor environment based on size, shape, color, texture, and weight.
- 5.2.P.B.1** Explore changes in liquids and solids when substances are combined, heated, or cooled (e.g. mix sand or clay with various amounts of water; mix different colors of tempura paints; freeze and melt water and other liquids).

### BIG IDEAS/COMMON THREADS

All objects and substances in the natural world are composed of matter. Substances can undergo physical or chemical changes to form new substances.

### ENDURING UNDERSTANDINGS

Substances such as liquids and solids can be changed.

### ESSENTIAL QUESTIONS

PRIMARY: What are the differences between a solid and a liquid?  
SECONDARY: How can substances be changed?

### MODULE ASSESSMENT

Sort and classify objects by different properties  
Investigate and make assertions about changes in properties during experiments  
Be able to predict outcomes and possible changes  
Record data with illustrations and simple terms

### LESSON OBJECTIVES

Students will be able to...

- develop a curiosity and interest in the objects that make up their world.
- explore a variety of solid objects.
- identify the properties of solid objects.
- sort solid objects by properties.
- explore a variety of liquids.
- identify the properties of liquids.
- sort liquids by properties.

- recognize differences between solids and liquids.
- sort materials according to properties.
- observe and describe what happens when properties are changed. (e.g. heating, cooling, and mixing)
- explore changes in state of solids and liquids.

## **MODULE SKILLS**

Students will be able to...

- acquire and use vocabulary associated with solids and liquids.
- communicate observations in oral form.
- sort objects by properties.
- take part in experiments that explore changes in matter.

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# SCIENCE CURRICULUM

## KINDERGARTEN – ENERGY AND MOTION

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### STATE STANDARD

- 5.2.P.C.1** Investigate sound, heat, and light energy (e.g. the pitch and volume of sound made by commercially made and homemade instruments, looking for shadows on the playground over time and under different weather conditions) through one or more of the senses.
- 5.2.P.E.1** Investigate how and why things move (e.g. slide blocks, balance structures, push structures over, use ramps to explore how far and how fast different objects move or roll).

### BIG IDEAS/COMMON THREADS

Knowing the characteristics of familiar forms of energy, including potential and kinetic energy, is useful in coming to the understanding that, for the most part, the natural world can be explained and is predictable.

### ENDURING UNDERSTANDINGS

The motion of objects change as a result of Potential and Kinetic energies. We understand the physical world of sound, heat, light, and energy through our observations.

### ESSENTIAL QUESTIONS

PRIMARY: How can you make something move?  
SECONDARY: How can energy affect motion?

### MODULE ASSESSMENT

Investigate how things move  
Manipulate objects to observe motion  
Use other objects to affect motion  
Experiment with sound, heat and light energy  
Verbalize the investigative process  
Illustrate concepts on paper with simple terms

### LESSON OBJECTIVES

Students will be able to...

- explore objects and materials through the guided discovery mode.
- develop the vocabulary to describe various types of motion.
- demonstrate different ways to produce motion.
- compare and contrast the various types of motion.
- explore the variables that affect motion.

- explain how force, push or pull must be exerted to make an object move.
- observe how their shadows move in relation to the movement of the Earth.
- explore motion and energy through a constructivist approach.

## **MODULE SKILLS**

Students will be able to...

- make accurate and detailed observations.
- communicate observations in oral and pictorial forms.
- make predictions.
- work effectively in small groups.
- apply and transfer knowledge to new situations.

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# **SCIENCE CURRICULUM KINDERGARTEN – ANIMALS – LIVING THINGS**

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## **STATE STANDARD**

- 5.3.P.A.1** Observations and discussions about the natural world form a basis for young learners' understanding of life science.
- 5.3.P.A.2** Observations and discussions form a basis for young learners' understanding of the similarities and differences among living and nonliving things.
- 5.3.P.B.1** Investigations form a young learners' understanding of how a habitat provides for an organism's energy needs.
- 5.3.P.C.1** Investigations and observations of the interactions between plants and animals form a basis for young learners' understanding of interdependence in life science.
- 5.3.P.D.1** Observations of developmental changes in a plant or animal over time form a basis for young learners' understanding of heredity and reproduction.

## **BIG IDEAS/COMMON THREADS**

The world of a young scientist consists of observations of living organisms and what they need to survive and thrive.

## **ENDURING UNDERSTANDINGS**

Physical characteristics of plants, humans, and other animals are observable through their habitat (food, shelter, water, air, light) and observing life cycles. Similarities and differences exist in the needs of living things, and the role of non-living things is important in their world.

## **ESSENTIAL QUESTIONS**

**PRIMARY:** What are the physical characteristics of plants, humans, and other animals? (Habitat and life cycle)

**SECONDARY:** What are the differences between living and non-living things?

## **MODULE ASSESSMENT**

Sequence the order of plants and animals in their life cycle.

Match animals to specific habitat needs.

Sort living and non-living things.

Label the physical characteristics of plants and animals.

Be able to differentiate between living and non living things

Verbalize an understanding of concepts and illustrate concepts on paper with simple words.

## **LESSON OBJECTIVES**

Students will be able to...

- identify the needs of plants and animals.
- identify the parts of plants and animals.
- observe differences between living and non-living things.
- observe the growth and development of plants and animals in their habitat.
- describe and discuss how habitats provide the needs for plants and animals.

## **MODULE SKILLS**

Students will be able to...

- compare and contrast plants and animals.
- make accurate and detailed observations.
- observe plant growth using standards and non-standard measurements.
- record the change of plants and animals over time.
- communicate information in oral, written and pictorial forms.

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# **SCIENCE CURRICULUM**

## **KINDERGARTEN - EARTH MATERIALS NON-LIVING**

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### **STATE STANDARD**

- 5.4.P.C.1** Observations and investigations form a basis for young learners' understanding of properties of Earth materials.
- 5.4.P.E.1** Observations and investigations form the basis for young learners' understanding of energy in Earth systems.
- 5.4.P.F.1** Observations and investigations form the basis for young learners' understanding of weather and climate.
- 5.4.P.G.1** Investigations in environmental awareness activities form a basis for young learners' understanding of biogeochemical changes.

### **BIG IDEAS/COMMON THREADS**

Earth and environment are impacted and influenced by sunlight, weather and climate changes. Our ability to conserve and recycle is an important step in respecting both Earth and environment.

### **ENDURING UNDERSTANDINGS**

Earth materials are made up of soil, rocks etc. Earth systems are affected by the sun, weather and climate. We preserve earth through recycling, conservation and respect for the environment.

### **ESSENTIAL QUESTIONS**

PRIMARY: Why is it important to learn about the natural world?

SECONDARY: How can we describe the things in the natural world?

### **MODULE ASSESSMENT**

Label the characteristics of Earth materials.

Record the changes the sunlight has on living and non-living things.

Chart/graph/tally the weather climate throughout the year.

Participate in recycling and conservation activities.

### **LESSON OBJECTIVES**

Students will be able to...

- ask questions about the natural world.
- describe the weather conditions for a given day.
- describe the weather conditions associated with each season.
- observe and describe how seasons affect plants and animals.
- describe characteristics of soil, rocks, water, and air.
- explore the effects of sunlight on living and nonliving things.
- recycle and conserve classroom materials.

## **MODULE SKILLS**

Students will be able to...

- demonstrate awareness for conservation, recycling, and respect for the environment.
- compare weather conditions.
- take parts in experiments with sunlight.
- recycle in the classroom and at home.
- conserve energy and water.

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# SCIENCE CURRICULUM

## FIRST GRADE – INSECTS

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### STATE STANDARD

- 5.1.P.A.1 Display curiosity about science objects, materials, activities, and long term investigations in progress.
- 5.1.P.B.1 Observe, question, predict, and investigate materials, objects, and phenomena during indoor and outdoor classroom activities and during any long-term investigations.
- 5.1.P.B.2 Use basic science terms and topic related science vocabulary.
- 5.1.P.C.1 Communicate with other children and adults to share observations, pursue questions, and make predictions and/or conclusions.
- 5.1.P.D.1 Represent observations and work through drawing, recording, data and writing.
- 5.3.2.A.1 Group living and nonliving things according to the characteristics that they share.
- 5.3.2.B.2 Compare how different animals obtain food and water.
- 5.3.2.D.1 Record the observable characteristics of plants and animals to determine the similarities and differences between parents and their offspring.
- 5.3.2.D.2 Determine the characteristic changes that occur during the life cycle of plants and animals by examining a variety of species, and distinguish between growth and development.
- 5.3.2.E.1 Describe similarities and differences in observable traits between parents and offspring.
- 5.3.2.E.2 Describe how similar structures found in different organisms (e.g., eyes, ears, mouths) have similar functions and enable those organisms to survive in different environments.
- 5.4.2.G.3 Identify and use water conservation practices.
- 5.1.4.D.1 Actively participate in discussions about student data, questions, and understandings.

### BIG IDEAS/COMMON THREADS

Living organisms carry out functions required for life. They reproduce, develop, have predictable life cycles.

### ENDURING UNDERSTANDINGS

Living things need food, water to survive. They also reproduce and grow and develop in predictable ways. Organisms reproduce, develop, have predictable life cycles, and pass on some traits to their offspring  
Sometimes differences between individual organisms give them a better chance of survival than another.

## **ESSENTIAL QUESTIONS**

PRIMARY: What are the needs of all living things? What would your world be like without insects?

SECONDARY: How do the structure and behavior of insects enable them to survive?

## **MODULE ASSESSMENT**

Sequence the lifecycle of a butterfly

Use symmetry to draw butterfly

Keep an observation journal (caterpillar/butterfly)

Label insect body parts

Observe a complete life cycle of a butterfly in the classroom by recognizing, recording and communicating changes observed in the organism over time.

Use records from their own observations to discriminate between the changes that are due to growth (size, weight, etc.) and which are due to development (structural changes).

## **LESSON OBJECTIVES**

Students will be able to...

- explain how to care for caterpillars.
- identify the body parts of a caterpillar.
- describe the function of each body part of a caterpillar.
- list the characteristics that all living things share.
- list the needs of living things.
- identify the needs of the caterpillar.
- observe how caterpillars and butterflies develop.
- explain how caterpillars produce and use silk.
- describe the life cycle of a butterfly.
- identify what a butterfly needs to survive: air, food, water, and open space.
- identify the body parts of butterflies.
- describe the function of each body part of a butterfly.
- compare the painted lady butterfly to other butterflies.
- list the characteristics that all insects share.
- explain that some butterflies migrate.
- read about the life cycle of insects.
- examine the anatomy of an insect.
- develop a curiosity and interest in insects and a respect for them as living things.
- experience some of the great diversity of insects in the animal kingdom.

## **MODULE SKILLS**

Students will be able to...

- make accurate and detailed observations.
- compare and contrast objects.
- select and use metric and English measuring tools.
- communicate information and observations in oral, written and pictorial forms.
- compare and contrast animals.
- demonstrate how to use a hand magnifier.
- organize information in a calendar.
- develop a timeline.
- organize data and information in calendars, graphs, and charts.

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# SCIENCE CURRICULUM

## FIRST GRADE – ECOSYSTEMS

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### STATE STANDARD

- 5.1.P.A.1 Display curiosity about science objects, materials, activities, and long term investigations in progress.
- 5.1.P.B.2 Use basic science terms and topic related science vocabulary.
- 5.1.P.C.1 Communicate with other children and adults to share observations, pursue questions, and make predictions and/or conclusions.
- 5.1.P.D.1 Represent observations and work through drawing, recording, data and writing.
- 5.3.2.C.1 Describe the ways in which organisms interact with each other and their habitats in order to meet basic needs.
- 5.3.2.C.2 Identify the characteristics of a habitat that enable the habitat to support the growth of many different plants and animals.
- 5.3.2.C.3 Communicate ways that humans protect habitats and/or improve conditions for the growth of the plants and animals that live there, or ways that humans might harm habitats.
- 5.3.2.E.2 Describe how similar structures found in different organisms (e.g., eyes, ears, mouths) have similar functions and enable those organisms to survive in different environments.
- 5.1.4.D.1 Actively participate in discussions about student data, questions, and understandings.

### BIG IDEAS/COMMON THREADS

Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.

### ENDURING UNDERSTANDINGS

Sometimes differences between individual organisms give them a better chance of survival than another

### ESSENTIAL QUESTIONS

PRIMARY: What are specific attributes of a particular ecosystem?

SECONDARY: What features do plants and animals have to survive in a particular ecosystem?

### MODULE ASSESSMENT

Record observations on charts and graphs.

Your class has been asked by a local Nature Society to choreograph and present a unique dance illustrating how animals meet their energy needs

in nature. Create costumes that highlight animals' unique physical features (trunks, beaks, claws, feet, coloring etc.) and develop a dance to demonstrate those unique behaviors animals display to obtain their food. At the end of the presentation, discuss with the audience which animals were included and how they obtain food in nature.

Create a rainforest scene. Have students illustrate rainforest animals and place their illustration in the appropriate rainforest layer (emergent, canopy, understory, and forest floor) Illustrate simple food chains and the terms producer and consumer

## **LESSON OBJECTIVES**

Students will be able to...

- recognize the ecosystem as an environment that receives precipitation and evaporation.
- develop an understanding that animals adapt to survive.
- recognize that ecosystems are different within themselves.
- identify some plants and animals found in the ecosystem studied.
- identify different layers or parts of the rain forest, forest floor, emergent under story, and canopy.
- understand that the rain forest holds half of all plant and animal species on Earth.
- understand that the rain forest provides many products including tropical timber, fruits, spices, nuts, coffee, tea, bamboo, rubber latex, and drugs for the treatment of diseases.
- understand that the rain forest influences the weather and atmosphere.
- identify the different layers or parts of the ecosystem studied.

## **MODULE SKILLS**

Students will be able to...

- make accurate and detailed observations.
- compare and contrast objects.
- communicate information and observations in oral, written and pictorial forms.
- compare and contrast animals.
- organize information in a calendar.

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# SCIENCE CURRICULUM

## FIRST GRADE – BALANCE AND MOTION

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### STATE STANDARD

- 5.1.P.A.1** Display curiosity about science objects, materials, activities, and long term investigations in progress.
- 5.1.P.B.2** Use basic science terms and topic related science vocabulary.
- 5.1.P.C.1** Communicate with other children and adults to share observations, pursue questions, and make predictions and/or conclusions.
- 5.1.P.D.1** Represent observations and work through drawing, recording, data and writing.
- 5.2.2.E.1** Investigate and model the various ways that inanimate objects can move.
- 5.2.2.E.2** Predict an object's relative speed, path, or how far it will travel using various forces and surfaces.
- 5.2.2.E.3** Distinguish a force that acts by direct contact with an object (e.g., by pushing or pulling) from a force that can act without direct contact (e.g., the attraction between a magnet and a steel paper clip).
- 5.1.4.D.1** Actively participate in discussions about student data, questions, and understandings.

### BIG IDEAS/COMMON THREADS

It takes energy to change the motion of objects. The energy change is understood in terms of forces.

### ENDURING UNDERSTANDINGS

Motion requires forces of energy. Balance requires certain variables for stability.

### ESSENTIAL QUESTIONS

PRIMARY: How do you know if something is stable?

SECONDARY: How many ways can you make something move?

### MODULE ASSESSMENT

Observation

Student participation

Written assessment

Activity sheets

Observe, record, and describe the parts that make up common classroom objects using hand lenses. Use writing and drawing to communicate observations and descriptions of how parts come together to make a whole system that functions.

Model different pathways of movement and have classmates describe or name the movement. Switch roles.  
Identify objects that only move in one way and others that may move in many ways.

## **LESSON OBJECTIVES**

Students will be able to...

- explore the variables necessary to create a stable system.
- use counterweights to create a stable system.
- demonstrate that different objects with varied shapes can be made to balance.
- explore objects and materials through the guided discovery mode.
- operationally define balance, balance point, counterweight, and stability.
- demonstrate ways to balance cardboard shapes and objects.
- construct mobiles.
- observe systems that are unstable and modify them so they are stable.
- develop the vocabulary to describe various types of motion.
- demonstrate different ways to produce rotational motion.
- compare and contrast the various types of motion.
- explore the variables that affect motion.
- compare and contrast rolling systems with different-sized wheels.
- observe rolling systems with weights attached. (optional)
- identify the six simple machines including the lever, wheel-and-axle, pulley, inclined plane, wedge, and screw.
- explain how each machine makes work easier.
- explain how force, push or pull must be exerted to make a simple machine work.

## **MODULE SKILLS**

Students will be able to...

- make accurate and detailed observations.
- communicate observations in oral and pictorial forms.
- make predictions.
- work effectively in small groups.
- apply and transfer knowledge to new situations.

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# **SCIENCE CURRICULUM FIRST GRADE – WEATHER AND SEASONS**

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## **STATE STANDARD**

- 5.1.P.A.1** Display curiosity about science objects, materials, activities, and long term investigations in progress.
- 5.1.P.B.1** Observe, question, predict, and investigate materials, objects, and phenomena during indoor and outdoor classroom activities and during any long-term investigations.
- 5.1.P.B.2** Use basic science terms and topic related science vocabulary.
- 5.1.P.B.3** Identify and use basic tools and technology to extend exploration in conjunction with science investigations.
- 5.1.P.C.1** Communicate with other children and adults to share observations, pursue questions, and make predictions and/or conclusions.
- 5.1.P.D.1** Represent observations and work through drawing, recording, data and writing.
- 5.4.2.A.1** Determine a set of general rules describing when the Sun and Moon are visible based on actual sky observations.
- 5.4.2.F.1** Observe and document daily weather conditions and discuss how the weather influences your activities for the day.
- 5.4.2.G.1** Observe and discuss evaporation and condensation.
- 5.1.4.D.1** Actively participate in discussions about student data, questions, and understandings.

## **BIG IDEAS/COMMON THREADS**

Earth's weather and climate systems are the result of complex interactions or cycles between land, ocean, ice, and atmosphere.

## **ENDURING UNDERSTANDINGS**

Temperature, wind, and precipitation influence our daily activities.  
The Earth is a system, continuously moving resources from one part of the system to another?

## **ESSENTIAL QUESTIONS**

PRIMARY: How does the weather, or changes in weather, affect our lives?  
SECONDARY: How do we observe and record the weather?

## **MODULE ASSESSMENT**

Interpret and create weather graphs  
Read and record thermometer readings  
Record temperature and weather patterns Have students journal weather over a period of time

Have students explain how weather influences the way we dress and our daily experiences during each season  
Students can illustrate seasonal activities and environmental changes over a year.  
Show students various clouds. Ask them to explain how cloud patterns are indicators of weather conditions.

## **LESSON OBJECTIVES**

Students will be able to...

- observe the weather conditions outside the school; observations will include temperature, precipitation, and sky conditions.
- graph the observations; record and evaluate for patterns.
- explain how the conditions affect our daily experiences.
- explain how weather changes according to the seasons.
- identify words to describe weather.
- observe and record weather conditions.
- use symbols to represent weather conditions.
- use a thermometer to measure temperature.
- graph weather data.

## **MODULE SKILLS**

Students will be able to...

- build upon the skills set forth for kindergarten.
- select tools and materials for a task.
- design testable questions.
- make accurate and detailed observations.
- record data and information in words, charts, graphs, and pictures.
- communicate observations orally.
- ask questions.
- design simple experiments.

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# SCIENCE CURRICULUM

## FIRST GRADE – OBJECTS IN THE SKY

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### STATE STANDARD

- 5.1.P.A.1** Display curiosity about science objects, materials, activities, and long term investigations in progress.
- 5.1.P.B.1** Observe, question, predict, and investigate materials, objects, and phenomena during indoor and outdoor classroom activities and during any long-term investigations.
- 5.1.P.B.2** Use basic science terms and topic related science vocabulary.
- 5.1.P.C.1** Communicate with other children and adults to share observations, pursue questions, and make predictions and/or conclusions.
- 5.1.P.D.1** Represent observations and work through drawing, recording, data and writing.
- 5.4.2.A.1** Determine a set of general rules describing when the Sun and Moon are visible based on actual sky observations.
- 5.1.4.D.1** Actively participate in discussions about student data, questions, and understandings.

### BIG IDEAS/COMMON THREADS

Our universe has been expanding and evolving for 13.7 billion years under the influence of gravitational and nuclear forces. As gravity governs its expansion, organizational patterns, and the movement of celestial bodies, nuclear forces within stars govern its evolution through the processes of stellar birth and death.

### ENDURING UNDERSTANDINGS

The moon and sun operate on cycles creating night and day.

### ESSENTIAL QUESTIONS

PRIMARY: How do objects in the sky affect our lives?  
SECONDARY: How do we observe and record data?

### MODULE ASSESSMENT

Observation

Activity sheets

Recording data

Have students answer the following questions:

Does the moon's position change as the night progresses?

What are two reasons why the Moon can sometimes be seen during the day as well as at night?

Does the sun move across the sky? If so, how?

Why do things in space look so small?

## **LESSON OBJECTIVES**

Students will be able to...

- explain how naturally occurring events (day/night, etc.) on Earth are related to the positions of the sun, Earth and moon.
- relate the motions of the Earth, sun and moon system to units of time including days, months, years and seasons.
- recognize that the sun appears to rise in the East and sets in the West.
- identify and compare a solar eclipse (eclipse of the sun) and a lunar eclipse (eclipse of the moon).

## **MODULE SKILLS**

Students will be able to...

- build upon the skills set forth for kindergarten.
- select tools and materials for a task.
- design testable questions.
- describe a system in terms of it's parts.

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# SCIENCE CURRICULUM

## SECOND GRADE – PLANTS

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### STATE STANDARD

- 5.1.4.A.1 Demonstrate understanding of the interrelationships among fundamental concepts in the physical, life, and Earth systems sciences.
- 5.1.4.D.1 Actively participate in discussions about student data, questions, and understandings.
- 5.1.4.D.4 Handle and treat organisms humanely, responsibly, and ethically.
- 5.3.2.A.1 Group living and non-living things according to the characteristics that they share.
- 5.3.2.B.1 Describe the requirements for the care of plants and animals related to meeting their energy needs.
- 5.3.2.B.3 Explain that most plants get water from soil through their roots and gather light through their leaves.
- 5.3.2.C.3 Communicate ways that humans protect habitats and/or improve conditions for the growth of the plants and animals that live there, or ways that humans might harm habitats.
- 5.3.2.D.1 Record the observable characteristics of plants and animals to determine the similarities and differences between parents and their offspring.
- 5.3.2.D.2 Determine the characteristic changes that occur during the life cycle of plants and animals by examining a variety of species, and distinguish between growth and development.
- 5.3.2.E.1 Describe similarities and differences in observable traits between parents and offspring.
- 5.3.2.E.2 Describe how similar structures found in different organisms (e.g., eyes, ears, mouths) have similar functions and enable those organisms to survive in different environments.
- 5.4.2.G.3 Identify and categorize the basic needs of living organisms as they relate to the environment.

### BIG IDEAS/COMMON THREADS

Plants have basic needs and parts that contribute to their existence.

### ENDURING UNDERSTANDINGS

Without plants there would be no life on earth. The knowledge of plant life cycles provides the ability to create optimum plant life.

### ESSENTIAL QUESTIONS

PRIMARY: What would your world be like without plants?

SECONDARY: How does knowledge of plant life cycles allow us to be better caretakers of plants?

## **MODULE ASSESSMENT**

Quizzes, narratives, illustrations (such as diagrams)

## **LESSON OBJECTIVES**

Students will be able to...

- operationally define germinate.
- measure and record the growth of a plant.
- discuss what a seed needs to germinate.
- identify the properties of seeds.
- compare and contrast seeds.
- identify the needs of plants.
- discuss the care of plants.
- observe and describe the changes that occur as plants grow and develop.
- identify the parts of plants [stem, root, leaf, bud, flower, seed, seed pod].
- explain the function of each plant part.
- describe various ways to make new plants. [stem cuttings, roots, bulbs, runners]
- describe the life cycle of a plant from seed to plant.
- identify ways we use plants.
- experiment with factors that affect plant growth.
- identify that soil is made up of tiny grains of rock and minerals.
- explain that soil becomes fertile when humus the remains of animals and plants is added to it describe the different soil layers, types and properties.

## **MODULE SKILLS**

Students will be able to...

- make accurate and detailed observations.
- communicate information in oral, written and pictorial forms.
- measure lengths using metric rulers.
- ask scientific questions.
- use the scientific method to find answers to questions.
- sequence events.
- compare and contrast materials.

## **RESOURCES** [Page 63](#)

# SCIENCE CURRICULUM

## SECOND GRADE – MATTER

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### STATE STANDARD

- 5.1.4.A.2 Use outcomes of investigations to build and refine questions, models, and explanations.
- 5.1.4.C.3 Present evidence to interpret and/or predict cause-and-effect outcomes of investigations.
- 5.1.4.D.1 Actively participate in discussions about student data, questions, and understandings.
- 5.2.2.A.1 Sort and describe objects based on the materials of which they are made and their physical properties.
- 5.2.2.A.2 Identify common objects as solids, liquids, or gases.
- 5.2.2.B.1 Generate accurate data and organize arguments to show that not all substances respond the same way when heated or cooled, using common materials, such as shortening or candle wax.

### BIG IDEAS/COMMON THREADS

By observing the properties of solids, liquids and gases students will develop the vocabulary to describe these properties and responses.

### ENDURING UNDERSTANDINGS

Matter is anything that takes up space. Solids have weight, take up space and hold their shape. Liquids have weight and take the shape of their container. Gases are usually invisible and take the shape of their container. Matter can change states.

### ESSENTIAL QUESTIONS

PRIMARY: What is matter?

SECONDARY: What are the characteristics of each substance of matter and what are their responses to a change in environment?

### MODULE ASSESSMENT

Quiz for each state of matter

Experiment Lab Sheet

Observe, record, and describe the parts that make up common classroom objects using hand lenses. Use writing and drawing to communicate observations and descriptions of how parts come together to make a whole. Identify all the parts and wholes they observe while eating their lunch. Identify the changes of state from liquid to gas in evaporation and gas to liquid in condensation using water as an example.

Describe the changes in the properties of water as it changes from solid to gas.

## LESSON OBJECTIVES

Students will be able to...

- develop a curiosity and interest in the objects that make up their world.
- explore a variety of solid objects.
- identify the properties of solid objects.
- sort solid objects by properties.
- identify the characteristic properties of solids.
- combine and separate solid materials of different particle size.
- explore a variety of liquids.
- identify the properties of liquids.
- sort liquids by properties.
- identify the characteristic properties of liquids.
- explore the existence of different gases.
- identify the properties of gases.
- recognize differences between solids, liquids, and gases.
- sort materials according to properties.
- observe and describe what happens when solids are mixed with water.
- observe and describe what happens when liquids are mixed with water.
- determine if Oobleck (Dr. Seuss) is a solid or a liquid.
- explore changes in state of solids, liquids and gases.

## MODULE SKILLS

Students will be able to...

- acquire the vocabulary associated with solids and liquids.
- organize information in various ways.
- communicate observations in oral and written form.
- transfer knowledge to new situations.
- sort objects by properties.
- accurately collect, record, interpret data.
- ask questions and seek ways to answer them.
- access information through various resources.
- work effectively with classmates.

## RESOURCES [Page 63](#)

# SCIENCE CURRICULUM

## SECOND GRADE – LIGHT

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### STATE STANDARD

- 5.1.4.A.3** Use scientific facts, measurements, observations, and patterns in nature to build and to critique scientific arguments.
- 5.1.4.C.2** Revise predictions or explanations on the basis of learning new information
- 5.2.2.C.1** Compare, citing evidence, the heating of different colored objects placed in full sunlight.
- 5.2.2.C.2** Apply a variety of strategies to collect evidence that validates the principle that if there is no light, objects cannot be seen.
- 5.2.2.C.3** Present evidence that represents the relationship between a light source, solid object, and the resulting shadow.
- 5.2.2.D.1** Predict and confirm the brightness of a light, the volume of sound, or the amount of heat when given the number batteries, or the size of batteries.

### BIG IDEAS/COMMON THREADS

Students will explore the behavior of light and its importance.

### ENDURING UNDERSTANDINGS

An object can only be seen when light strikes it and it is reflected to the viewer's eye. Shadows result when light cannot pass through a given object. Light is responsible for warming the land, air, and water.

### ESSENTIAL QUESTIONS

PRIMARY: What is the importance of light?

SECONDARY: How does light interact with its surroundings?

### MODULE ASSESSMENT

Quiz

Experiment Lab Sheet

Comprehensive assessment of unit content

Give students several colored objects and have them explain which would heat up faster or slower.

Set up a heat lab with an incandescent lamp and liquids and solids. Have students predict the heating outcomes.

With a flashlight and board eraser, have students illustrate how short and long shadows are made.

## **LESSON OBJECTIVES**

Students will be able to...

- understand that light is a form of energy.
- explain that the sun warms the land, air, and water.
- observe the sun's heat as a form of energy.
- compare (by citing evidence) the heating of different colored objects placed in full sunlight.
- understand that an object can be seen only when light strikes it.
- understand that in the absence of light, objects cannot be seen.
- explain that when light strikes a substance that it cannot pass through, a shadow results.
- explore shadows using different light sources, different objects, and transparent, translucent, and opaque objects.

## **MODULE SKILLS**

Students will be able to...

- acquire the vocabulary associated with light and reflection.
- organize information in various ways.
- communicate observations in oral and written form.
- transfer knowledge to new situations.
- create a scenario in which a shadow will result.
- accurately collect, record, and interpret data.
- ask questions and seek ways to answer them.
- access information through various resources.
- work effectively with classmates.

## **RESOURCES** [Page 63](#)

# SCIENCE CURRICULUM SECOND GRADE – SOIL

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## STATE STANDARD

- 5.1.4.A.1** Demonstrate understanding of the interrelationships among fundamental concepts in the physical, life, and Earth systems sciences.
- 5.1.4.B.2** Measure, gather, evaluate, and share evidence using tools and technologies.
- 5.1.4.D.1** Actively participate in discussions about student data, questions, and understandings.
- 5.4.2.C.1** Describe earth materials using appropriate terms, such as hard, soft, dry, wet, heavy, and light.
- 5.4.2.G.4** Identify the natural resources used in the process of making various manufactured products.

## BIG IDEAS/COMMON THREADS

The earth operates as a part of the all- encompassing system.

## ENDURING UNDERSTANDINGS

Soil has many different properties and a variety of living organisms existing in this environment. Composting helps the environment by reducing the amount of solid waste that ends up in landfills.

## ESSENTIAL QUESTIONS

PRIMARY: What are the properties of soil and what types of living organisms can you find in soil?

SECONDARY: How does composting help the environment?

## MODULE ASSESSMENT

Quizzes

Pictorial forms

Written and oral narratives

Identify two ways that dirt and soil are different.

Determine the characteristics of soil that they would look for when planning a vegetable garden and explain why this information is useful.

After discussing “ percolation” have students predict and test various soils for percolation rates.

## LESSON OBJECTIVES

Students will be able to...

- state the properties of soil.

- identify everyday manufactured products such as paper and cans can be traced back to natural resources.
- identify living organisms in soils.
- identify the attributes and properties of soil such as moisture, kind, and size of particles living/organic elements vary depending on location.
- state how composting helps the environment.

## **MODULE SKILLS**

Students will be able to...

- create and establish a functional composting center.
- identify what is in soil.
- compare soil to dirt.
- sort and compare different kinds of soil.
- explore organisms living in the dirt.
- compare how different soils hold water.
- make soil using natural resources.

## **RESOURCES** [Page 63](#)

# SCIENCE CURRICULUM

## THIRD GRADE – ECOSYSTEMS

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### STATE STANDARD

- 5.1.4.A.1 Demonstrate understanding of the interrelationships among fundamental concepts in the physical, life, and Earth systems sciences.
- 5.1.4.A.2 Use outcomes of investigations to build and refine questions, models, and explanations.
- 5.1.4.A.3 Use scientific facts, measurements, observations, and patterns in nature to build and critique scientific arguments.
- 5.1.4.B.3 Formulate explanations from evidence.
- 5.1.4.C.2 Revise predictions or explanations on the basis of learning new information.
- 5.1.4.D.4 Handle and treat organisms humanely, responsibly, and ethically.
- 5.3.4.A.1 Develop and use evidence-based criteria to determine if an unfamiliar object is living or nonliving.
- 5.3.4.B.1 Identify sources of energy (food) in a variety of settings (farm, zoo, ocean, forest).
- 5.3.4.C.1 Predict the biotic and abiotic characteristics of an unfamiliar organism's habitat.
- 5.3.4.C.2 Explain the consequences of rapid ecosystem change (e.g., flooding, wind storms, snowfall, volcanic eruptions), and compare them to consequences of gradual ecosystem change (e.g., gradual increase or decrease in daily temperatures, change in yearly rainfall).
- 5.3.4.D.1 Compare the physical characteristics of plants and animals to determine the similarities and differences between parents and their offspring
- 5.3.4.E.1 Model an adaptation to a species that would increase its chances of survival, should the environment become wetter, dryer warmer, or colder over time.
- 5.3.4.E.2 Evaluate similar populations in an ecosystem with regard to their ability to thrive and grow.

### BIG IDEAS/COMMON THREADS

Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life.

Matter and Energy Transformations: Food is required for energy and building cellular materials.

Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.

Heredity and Reproduction: Organisms reproduce, develop, and have predictable life cycles.

Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments.

## **ENDURING UNDERSTANDINGS**

Organisms reproduce, develop, have predictable life cycles, and pass on some traits to their offspring.

Living organisms have a variety of observable features that enable them to obtain food and reproduce.

All organisms transfer matter and convert energy from one form to another.

All animals and most plants depend on both other organisms and their environments for their basic needs.

## **ESSENTIAL QUESTIONS**

PRIMARY: How is matter transformed, and energy transferred/transformed in living systems?

SECONDARY: What do all living things have in common?

In what ways do organisms interact within ecosystems?

How do organisms change as they go through their life cycle?

In what ways are organisms of the same kind different from each other?

How does this help them reproduce and survive?

Why is the food chain important to all living things?

## **MODULE ASSESSMENT**

Teacher made test using the following:

Word banks, matching, fill in the blanks

Teacher observation

Create a food web for a specific habitat

Vocabulary quizzes

## **LESSON OBJECTIVES**

Students will be able to...

- determine that animals are living things; some animals only eat animals for their food and some of these animals may become food for other animals, resulting in a food chain.
- explain that plants in a food chain are producers and animals are consumers.
- understand that animals can be classified as herbivores, carnivores or omnivores.
- explain the direction of arrows on a food chain illustrating the flow of energy through a food chain.
- know every food chain begins with the sun as its source of energy.

- identify sources of energy (food) in a variety of settings ( farm, zoo, ocean, forest).

## **MODULE SKILLS**

Students will be able to...

- manipulate materials.
- communicate observations in oral, written, and pictorial forms.
- graph data.
- ask scientific questions.
- use the scientific method to answer questions.

## **RESOURCES** [Page 63](#)

# SCIENCE CURRICULUM

## THIRD GRADE - MAGNETS

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### STATE STANDARD

- 5.1.4.C.2 Revise predictions or explanations on the basis of learning new information.
- 5.1.4.D.1 Actively participate in discussions about student data, questions, and understandings.
- 5.1.4.D.2 Work collaboratively to pose, refine, and evaluate questions, investigations, models, and theories
- 5.1.4.D.3 Demonstrate how to safely use tools, instruments, and supplies.
- 5.2.4.E.3 Investigate and categorize materials based on their interaction with magnets.

### BIG IDEAS/COMMON THREADS

Forces and Motion: It takes energy to change the motion of objects. The energy change is understood in terms of forces.

Energy Transfer and Conservation: The conservation of energy can be demonstrated by keeping track of familiar forms of energy as they are transferred from one object to another.

### ENDURING UNDERSTANDINGS

Changes take place because of the transfer of energy.

Energy is transferred to matter through the action of forces.

Different forces are responsible for the transfer of the different forms of energy.

### ESSENTIAL QUESTIONS

PRIMARY: How can energy be transferred from one material to another?

SECONDARY: What happens to a material when energy is transferred to it?

### MODULE ASSESSMENT

Teacher made test using the following:

Word banks, matching, fill in the blanks

Teacher observation

Vocabulary quizzes

Magnet lab: categorize what is magnetic and what is not.

## LESSON OBJECTIVES

Students will be able to...

- discover that magnets display forces of attraction and repulsion.
- observe the interaction of permanent magnets with a variety of common materials.
- test and classify objects as magnetic or non-magnetic.
- understand that magnets are attracted to objects that contain iron, nickel, and cobalt.
- measure the change in force between two magnets as the distance between them changes.
- observe and explain repulsion and attraction of magnetic poles of two or more magnets.
- describe a magnetic field.
- observe and describe the line of force surrounding a magnet using iron filings.
- compare the arrangements of iron particles in magnetized and non-magnetized pieces of iron.
- discuss ways in which magnets can be used to cause motion, as in a motor.
- describe how magnetism can be used to produce electricity.
- describe the interrelationship between electricity and magnetism.
- construct an electromagnet.

## MODULE SKILLS

Students will be able to...

- manipulate materials.
- devise a method to test their predictions, test their predictions, and discuss results.
- communicate information in oral, written, and pictorial form.
- record observations and measurements in written, oral, pictorial, and graphical forms.

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# SCIENCE CURRICULUM

## THIRD GRADE - EARTH SUN MOON

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### STATE STANDARD

- 5.1.4.B.2 Measure, gather, evaluate, and share evidence using tools and technologies.
- 5.1.4.C.2 Revise predictions or explanations on the basis of learning new information.
- 5.1.4.D.1 Actively participate in discussions about student data, questions, and understandings.
- 5.1.4.D.2 Work collaboratively to pose, refine, and evaluate questions, investigations, models, and theories.
- 5.4.4.A.1 Formulate a general description of the daily motion of the Sun across the sky based on shadow observations. Explain how shadows could be used to tell the time of day.
- 5.4.4.A.2 Identify patterns of the moon's appearance and make predictions about its future appearance based on observational data.
- 5.4.4.A.3 Generate a model with explanatory value that explains both why objects roll down ramps as well as why the Moon orbits Earth.
- 5.4.4.A.4 Analyze and evaluate evidence in the form of data tables and photographs to categorize and relate solar system objects (e.g., planets, dwarf planets, moons, asteroids, and comets).
- 5.4.4.E.1 Develop a general set of rules to predict temperature changes of Earth materials, such as water, soil, and sand, when placed in the Sun and in the shade.

### BIG IDEAS/COMMON THREADS

Objects in the Universe: Our Universe has been expanding and evolving for 13.7 billion years under the influence of gravitational and nuclear forces. Energy in Earth Systems: Internal and external sources of energy drive the Earth system.

### ENDURING UNDERSTANDINGS

Observable, predictable patterns in the solar system occur because of gravitational interactions and energy from the Sun, which impact on Earth.

### ESSENTIAL QUESTIONS

PRIMARY: To what extent are the properties of objects in our solar system predictable?

SECONDARY: What causes these patterns?

## **MODULE ASSESSMENT**

Teacher made test using the following:  
Word banks, matching, fill in the blanks  
Teacher observation  
Star Lab observations and journal entries  
Record of the phases of the moon  
Vocabulary quizzes

## **LESSON OBJECTIVES**

Students will be able to...

- visit a planetarium to set the stage for this unit – Star lab.
- distinguish between rotation and revolution.
- explain the affect of motion of bodies in space on the Earth.
- explain the cause of day and night.
- explain what causes eclipses.
- demonstrate why bodies in space look so small.
- identify the characteristics of the planets.
- compare and contrast the planets.
- identify the inner and outer planets.
- define orbit.
- observe and record the phases of the Moon.
- explain how the Sun warms the Earth.
- define constellation.
- make a model of a constellation.
- make a model of the solar system.

## **MODULE SKILLS**

Students will be able to...

- access, evaluate, and organize information from a variety of sources including computer materials.
- work effectively in cooperative groups.
- construct models.
- communicate information and data in charts and graphs.

## **RESOURCES** [Page 63](#)

# SCIENCE CURRICULUM THIRD GRADE – MATTER

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## STATE STANDARD

- 5.1.4.C.2 Revise predictions or explanations on the basis of learning new information.
- 5.1.4.C.3 Present evidence to interpret and/or predict cause-and-effect outcomes of investigation.
- 5.1.4.B.1 Design and follow simple plans using systematic observations to explore questions and predictions.
- 5.1.4.D.1 Actively participate in discussions about student data, questions, and understandings
- 5.1.4.D.2 Work collaboratively to pose, refine, and evaluate questions, investigations, models, and theories.
- 5.1.4.D.3 Demonstrate how to safely use tools, instruments, and supplies.
- 5.2.4.A.2 Plan and carry out an investigation to distinguish among solids, liquids, and gasses.
- 5.2.4.A.1 Identify objects that are composed of a single substance and those that are composed of more than one substance using simple tools found in the classroom.
- 5.2.4.A.3 Determine the weight and volume of common objects using appropriate tools.
- 5.2.4.B.1 Predict and explain what happens when a common substance, such as shortening or candle wax, is heated to melting and then cooled to a solid.

## BIG IDEAS/COMMON THREADS

Properties of Matter: All objects and substances in the natural world are composed of matter.

Changes in Matter: Substances can undergo physical or chemical changes to form new substances.

## ENDURING UNDERSTANDINGS

Each state of matter has unique properties, solids, liquids and gases possess unique characteristics which can be altered. The structures of materials determine their properties.

## ESSENTIAL QUESTIONS

PRIMARY: How do the properties of materials determine their use?

SECONDARY: How does conservation of mass apply to the interaction of materials in a closed system?

## MODULE ASSESSMENT

Teacher made test using the following:

Word banks, matching, fill in the blanks

Teacher observation

Vocabulary quizzes

Lab on changing matter in a chemical or physical change

## LESSON OBJECTIVES

Students will be able to...

- recognize properties of matter (color, size, shape, texture, composition, mass, hardness, etc.).
- define and compare mass and weight.
- classify and identify states of matter; their arrangement and motion of particles ( solid, liquid, gases ).
- define terms: atom and molecule.
- identify changes in size, shape, and state as physical changes.
- recognize changes in temperature can cause changes of state.
- define terms: freezing point, boiling point, evaporation, and condensation.
- identify changes in matter forming different matter as chemical changes.
- explore activities involving physical and chemical changes.
- identify mass as the amount of matter in an object.
- combine two or more materials and show that the new material may have properties that are different from the original material.

## MODULE SKILLS

Students will be able to...

- identify units of measurement as gram, kilogram, etc., when measuring mass.
- identify length as a measurement of matter.
- identify units of measurement as centimeter, meter, kilometer when measuring length.
- identify volume as a measurement of the amount of space an object takes up.
- identify units of measurement as milliliter, liter, etc. when measuring liquids and cubes when measuring solids.

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# SCIENCE CURRICULUM

## THIRD GRADE - ROCKS AND MINERALS

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### STATE STANDARD

- 5.4.4.B.1 Use data gathered from observations of fossils to argue whether a given fossil is terrestrial or marine in origin.
- 5.4.4.C.1 Create a model to represent how soil is formed.
- 5.1.4.C.1 Monitor and reflect on one's own knowledge regarding how ideas change over time.
- 5.1.4.C.2 Revise predictions or explanations on the basis of learning new information.
- 5.1.4.D.1 Actively participate in discussions about student data, questions, and understandings .
- 5.1.4.D.2 Work collaboratively to pose, refine, and evaluate questions, investigations, models, and theories.
- 5.1.4.D.3 Demonstrate how to safely use tools, instruments, and supplies.
- 5.4.4.C.2 Categorize unknown samples of rocks and minerals.

### BIG IDEAS/COMMON THREADS

History of Earth: It has been evolving as a result of geologic, biological, physical and chemical processes.

Properties of Earth Materials: The Earth's composition is unique, related to the origin of our solar system, and provides us with the raw resources needed to sustain life.

### ENDURING UNDERSTANDINGS

Earth's components form systems. These systems continually interact at different rates of time, affecting the shape of the Earth's surface regionally and globally.

Earth materials in nature include rocks, minerals, soils, water, and the gases of the atmosphere. Attributes of rocks and minerals assist in their identification.

### ESSENTIAL QUESTIONS

PRIMARY: How do geologic events occurring today provide insight Earth's past?

SECONDARY: How do Earth Systems interact to create soil?

How do we use observable characteristics of Earth materials to identify different parts of the Earth System?

## **MODULE ASSESSMENT**

Teacher made test using the following:

Word banks, matching, fill in the blanks

Teacher observation

Classify rocks in three categories (sedimentary, metamorphic, igneous)

## **LESSON OBJECTIVES**

Students will be able to...

- define earth material and gain experience with rocks and minerals.
- understand the process of taking apart and putting together to find out about materials.
- explain the relationship between rocks and minerals.
- operationally define mineral.
- observe, describe, order, and record properties of minerals: luster, hardness, cleavage and fracture, color and streak.
- carry out standard tests on various minerals.
- explain what geologists do.
- describe ways rocks and minerals are used.
- explain in simple terms how igneous rocks are formed.
- explain in simple terms how sedimentary rocks are formed.
- explain in simple terms how metamorphic rocks are formed.
- explain earth surface changes – slow processes – erosion, and rapid changes – volcanoes and landslides, effects of moving water, sources of water - oceans, rivers, lakes, underground springs, and glaciers, and identification of physical features with maps.

## **MODULE SKILLS**

Students will be able to...

- make inferences, and make and record accurate observations.
- serial order materials based on one property.
- compare and contrast materials.
- select and use metric measurement tools and demonstrate the proper use of a balance.
- carry out controlled studies and collect and organize data and share results.
- provide evidence for analysis and conclusions.
- recognize constants and replications.
- utilize instrumentation and measurement.

## **RESOURCES** [Page 63](#)

# **SCIENCE CURRICULUM**

## **FOURTH GRADE - HUMAN BODY SYSTEMS**

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### **STATE STANDARD**

- 5.1.4.A.1** Demonstrate understanding of the interrelationships of fundamental concepts in the physical, life and Earth systems sciences.
- 5.1.4.A.2** Use outcomes of investigations to build and refine questions, models and explanations.
- 5.1.4.A.3** Use scientific facts, measurements, observations, and patterns in nature to build and critique scientific arguments.
- 5.1.4.C.1** Monitor and reflect on one's own knowledge regarding how ideas change over time.
- 5.1.4.C.3** Present evidence to interpret and/or predict cause & effect outcomes of investigations.
- 5.1.4.B.1** Building and refining models and explanations requires generation and evaluation of evidence.
- 5.1.4.B.3** Formulate explanations from evidence
- 5.1.4.B.4** Communicate and justify explanations with reasonable & logical arguments
- 5.1.4.C.1** Monitor and reflect on one's own knowledge regarding how ideas change over time.
- 5.1.4.C.2** Revise predictions or explanations on the basis of learning new information.
- 5.1.4.D.2** Work collaboratively to pose, refine, and evaluate questions, investigations, models, and theories.
- 5.3.4.A.2** Compare and contrast structures that have similar functions in various organisms, and explain how those functions may be carried out by structures that have different physical appearances. Essential functions of the human body are carried out by specialized systems:
- Digestive
  - Circulatory
  - Respiratory
  - Nervous
  - Skeletal
  - Muscular
  - Reproductive
- 5.3.4.A.3** Describe the interactions of systems involved in carrying out everyday life activities.
- 5.3.4.B.1** Almost all energy (food) and matter can be traced to the Sun.

## **BIG IDEAS/COMMON THREADS**

Organization and Development: Living organisms are composed of cellular units (structures composed of molecules)

Matter and Energy Transformations: Food is required for energy and building cellular materials.

Life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth.

## **ENDURING UNDERSTANDINGS**

Humans have systems that function together to make the body work.

Living organisms have a variety of observable features that enable them to obtain food and reproduce.

## **ESSENTIAL QUESTIONS**

PRIMARY: What are the body's essential systems and how do they work?

SECONDARY: What do all living things have in common?

How is matter transformed, and energy transferred/transformed in living systems?

## **MODULE ASSESSMENT**

Identify what body parts belong to what system.

## **LESSON OBJECTIVES**

Students will be able to...

- identify parts of the nervous system: brain, spinal cord, nerves, sensory organs.
- explain how the parts of the nervous system function together.
- understand how the body reacts to changes in the environment.
- identify parts of the skeletal system: cranium, rib cage, pelvis, etc.
- explain how the skeletal system protects and supports the body.
- understand how the skeletal system connects(hinge joints and ball and socket.)
- identify parts of the respiratory system: lungs, windpipe, nose and mouth.
- explain how the respiratory system transports air into and out of the body.
- understand the exchange of gases.
- identify parts of the digestive system: mouth, tongue, teeth, esophagus, stomach, liver, kidney and intestine.
- explain how the digestive breaks down food.
- understand how the body absorbs food for energy.
- identify parts of the circulatory system: heart, blood, blood vessels.
- explain how blood transports materials throughout the body.

## **MODULE SKILLS**

Students will be able to...

- place major body parts in proper positions in a life size model of the body.
- write a short constructive response explaining how each system works.
- identify inter-relationships of body parts.

## **RESOURCES** [Page 63](#)

# SCIENCE CURRICULUM

## FOURTH GRADE – ENERGY

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### STATE STANDARD

- 5.1.4.A.1 Demonstrate understanding of the interrelationships of fundamental concepts in the physical, life and Earth systems sciences.
- 5.1.4.A.2 Use outcomes of investigations to build and refine questions, models and explanations.
- 5.1.4.A.3 Use scientific facts, measurements, observations, and patterns in nature to build and critique scientific arguments.
- 5.1.4.C.1 Monitor and reflect on one's own knowledge regarding how ideas change over time.
- 5.1.4.C.3 Present evidence to interpret and/or predict cause & effect outcomes of investigations.
- 5.1.4.B.1 Building and refining models and explanations requires generation and evaluation of evidence.
- 5.1.4.C.2 Revise predictions or explanations on the basis of learning new information.
- 5.2.4.A.4 Categorize objects based on the ability to absorb or reflect light and conduct heat or electricity.
- 5.2.4.C.1 Heat (thermal energy), electricity, light, and sound are forms of energy.
- 5.2.4.C.2 Heat (thermal energy) results when substances burn, when certain kinds of material rub against each other, and when electricity flows through wires. Metals are good conductors of heat (thermal energy) and electricity. Increasing the temperature of any substance requires the addition of energy.
- 5.2.4.C.3 Energy can be transferred from one place to another. Heat energy is transferred from warmer things to colder things.
- 5.2.4.C.4 Light travels in straight lines. When light travels from one substance to another (air and water), it changes direction.
- 5.2.4.D.1 Electrical circuits require a complete loop through conducting materials in which an electrical current can pass.

### BIG IDEAS/COMMON THREADS

Properties of Matter: All objects and substances in the natural world are composed of matter. Matter has two fundamental properties: matter takes up space, and matter has inertia.

Forms of Energy: The characteristic of familiar forms of energy, including potential and kinetic energy, is a useful explanation of the predictable natural world.

Energy Transfer and Conservation: The conservation of energy can be demonstrated by keeping track of familiar forms of energy as they are transferred from one object to another.

## **ENDURING UNDERSTANDINGS**

Energy takes many forms.

## **ESSENTIAL QUESTIONS**

PRIMARY: How do we know that things have energy?

SECONDARY: How can energy be transferred from one material to another?

What happens to a material when energy is transferred to it?

## **MODULE ASSESSMENT**

Lab experiments

Teacher created assessments/quizzes

Homework assignments

## **LESSON OBJECTIVES**

Students will be able to...

- identify static and current electricity and how each is produced.
- identify the parts of electric circuit.
- discover how to light a bulb with a battery, piece of wire, and a light bulb.
- construct various types of simple circuits with a battery, wire, a switch, and a light bulb.
- identify various sources of electricity they encounter in their everyday life.
- describe the interrelationship between electricity and magnetism.
- describe and compare the sounds as they travel through different matter.
- explain the relationship between the length of a vibrating nail and the pitch of the sounds produced.
- explore and describe the sounds made by vibrating rulers.
- relate the length of a vibrating ruler to the pitch of the sound produced.
- observe, describe, and compare the frequencies produced by different lengths of a vibrating ruler.
- describe the relationship among pitch, frequency, and length of a vibrating object.
- relate what they have learned about sound to musical instruments.
- explore the effect of tension by varying pitch on the sound produced by a vibrating string.
- demonstrate how to amplify sounds produced.
- explain how vocal cords produce sounds.

- understand that everything in the universe is either matter or energy.
- explain that light, heat, and sound are three forms of energy.
- explain the relationship between light and vision.
- explore how light interacts with matter (reflection and absorption).
- operationally define reflection and absorption of light.
- classify materials by the relative amounts of light that passes through them (opaque, transparent, translucent).
- observe the interaction of light with a mirror.
- explore the angle of incidence and angle of reflection of light on a plane mirror.
- apply their knowledge of angle of incidence and reflection to move a light beam across the room to strike a target.
- discuss images produced in concave and convex mirrors.
- define white light.
- observe the behavior of white light through a prism (refraction).
- describe how a rainbow is produced when light passes through a prism.
- construct a color wheel to demonstrate the mixing of light.
- explain that the thermometer is the tool for measuring temperature.
- compare the effect of color on heat absorption.
- demonstrate that heat moves from hot objects to cold objects.
- demonstrate that heat can be transferred through radiation, conduction, and convection.
- identify various sources of heat.

## **MODULE SKILLS**

Students will be able to...

- manipulate materials.
- devise a method to test their predictions, test their predictions, and discuss results - write a scientific lab report.
- record observations and measurements in written, oral, pictorial, and graphical forms.
- make accurate and detailed observations.
- design and carry out experiments.
- compare and contrast sounds.
- select and use appropriate metric measurement tools to measure temperature.
- communicate information and data in oral, written and pictorial forms including diagrams, charts, tables, and graphs.
- interpret and analyze graphical information.
- classify data and information.

## **RESOURCES** [Page 63](#)

# SCIENCE CURRICULUM

## FOURTH GRADE – WATER CYCLE

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### STATE STANDARD

- 5.1.4.A.1 Demonstrate understanding of the interrelationships of fundamental concepts in the physical, life and Earth systems sciences.
- 5.1.4.A.2 Use outcomes of investigations to build and refine questions, models and explanations.
- 5.1.4.A.3 Use scientific facts, measurements, observations, and patterns in nature to build and critique scientific arguments.
- 5.1.4.C.1 Monitor and reflect on one’s own knowledge regarding how ideas change over time.
- 5.1.4.C.3 Present evidence to interpret and/or predict cause & effect outcomes of investigations.
- 5.1.4.B.1 Building and refining models and explanations requires generation and evaluation of evidence.
- 5.1.4.B.3 Formulate explanations from evidence
- 5.1.4.B.4 Communicate and justify explanations with reasonable & logical arguments
- 5.1.4.C.1 Monitor and reflect on one’s own knowledge regarding how ideas change over time.
- 5.1.4.C.2 Revise predictions or explanations on the basis of learning new information.
- 5.1.4.D.2 Work collaboratively to pose, refine, and evaluate questions, investigations, models, and theories.
- 5.4.4.F.1 Identify patterns in data collected from basic weather instruments.
- 5.4.4.G.1 Explain how clouds form
- 5.4.4.G.2 observe daily cloud patterns, types of precipitation, and temperature, and categorize the clouds by the conditions that form precipitation.
- 5.4.4.G.3 Trace a path a drop of water might follow through the water cycle.
- 5.4.4.G.4 Model how the properties of water can change as water moves through the water cycle.

### BIG IDEAS/COMMON THREADS

Weather and Climate: Earth’s weather and climate system are the result of complex interactions between land, ocean, ice and atmosphere.

### ENDURING UNDERSTANDINGS

The Earth is a system, continuously moving resources from one part of the system to another.

## **ESSENTIAL QUESTIONS**

PRIMARY: How do changes in one part of an Earth system affect other parts of the system?

SECONDARY: Why will the Earth never run out of rain?

What factors affect weather?

How does the water cycle affect your daily life?

## **MODULE ASSESSMENT**

Teacher made assessments/quizzes

Homework assessments

Projects

Lab experiments

## **LESSON OBJECTIVES**

Students will be able to...

- describe the stages in the water cycle and explain its affect on weather.
- construct simple weather instruments: thermometer, rain gauge, wind vane, anemometer.
- explain how each instrument works and what it measures.
- discuss different types of precipitation.
- identify how water circulates through different states of matter – condensation, precipitation, evaporation.
- demonstrate the affect of changing temperature on the behavior of air.
- collect and record weather data daily.
- access weather data from multiple sources including the internet.
- analyze weather data and look for patterns.
- identify the major cloud types and their relationship to weather patterns.

## **MODULE SKILLS**

Students will be able to...

- measure weather conditions using appropriate instruments and record results.

## **RESOURCES** [Page 63](#)

# SCIENCE CURRICULUM

## FOURTH GRADE – FORCES AND MOTION

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### STATE STANDARD

- 5.1.4.A.1 Demonstrate understanding of the interrelationships of fundamental concepts in the physical, life and Earth systems sciences.
- 5.1.4.A.2 Use outcomes of investigations to build and refine questions, models and explanations.
- 5.1.4.A.3 Use scientific facts, measurements, observations, and patterns in nature to build and critique scientific arguments.
- 5.1.4.C.1 Monitor and reflect on one's own knowledge regarding how ideas change over time.
- 5.1.4.C.3 Present evidence to interpret and/or predict cause & effect outcomes of investigations.
- 5.1.4.B.1 Building and refining models and explanations requires generation and evaluation of evidence.
- 5.1.4.B.3 Formulate explanations from evidence
- 5.1.4.B.4 Communicate and justify explanations with reasonable & logical arguments
- 5.1.4.C.1 Monitor and reflect on one's own knowledge regarding how ideas change over time.
- 5.1.4.C.2 Revise predictions or explanations on the basis of learning new information.
- 5.1.4.D.2 Work collaboratively to pose, refine, and evaluate questions, investigations, models, and theories.
- 5.2.4.E.1 Demonstrate through modeling that motion is a change in position over a period of time.
- 5.2.4.E.2 Identify the force that starts something moving or changes its speed or direction of motion.
- 5.2.4.C.1 Compare various forms of energy as observed in everyday life and describe their applications.
- 5.2.4.C.3 Draw and label diagrams showing several ways that energy can be transferred from one place to another.

### BIG IDEAS/COMMON THREADS

Forms of Energy: The characteristic of familiar forms of energy, including potential and kinetic energy, is a useful explanation to the predictable natural world.

### ENDURING UNDERSTANDINGS

Energy takes many forms (kinetic and potential) which can be transferred and cause change.

## **ESSENTIAL QUESTIONS**

PRIMARY: How is energy transferred to matter and what changes are caused as a result?

SECONDARY: How does energy affect how machines work?

## **MODULE ASSESSMENT**

Teacher made assessments/quizzes

Homework assessments

Projects

Lab experiments

## **LESSON OBJECTIVES**

Students will be able to...

- discuss the nature of motion and how and why things move.
- describe some ways in which objects move.
- observe that objects move at different speeds.
- describe Newton's Laws of Motion (action/reaction, once in motion stays in motion until acted upon by an outside force).
- define energy as the ability to do work.
- distinguish between kinetic energy and potential energy.
- describe how people use simple machines to move things.
- identify the following simple machines that make work easier (lever, pulley and gear, incline plane, screw, wheel and axle).
- describe how machines make work easier.
- demonstrate how simple machines can move an object.
- define and give examples of some compound machines ( can opener, wheelbarrow, bicycle).
- describe how compound machines use energy.
- understand that compound machines are just two or more simple machines combined.

## **MODULE SKILLS**

Students will be able to...

- select and use appropriate metric measurement tools to measure temperature.
- write a scientific lab report.
- communicate information and data in oral, written and pictorial forms including diagrams, charts, tables, and graphs.
- interpret and analyze graphical information.
- classify data and information.

## **RESOURCES** [Page 63](#)

# SCIENCE CURRICULUM

## FIFTH GRADE – BIOSPHERE

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### STATE STANDARD

- 5.1.8.A.3** Use scientific principles and models to frame and synthesize scientific arguments and pose theories
- 5.1.8.C.1** Monitor one's own thinking as understandings of scientific concepts are refined.
- 5.1.8.C.2** Revise predictions or explanations on the basis of discovering new evidence, learning new information, or using models.
- 5.1.8.C.3** Generate new and productive questions to evaluate and refine core explanations.
- 5.1.8.D.1** Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
- 5.1.8.D.2** Engage in productive scientific discussion practices during conversations with peers, both face-to-face and virtually, in the context of scientific investigations and model-building.
- 5.3.6.A.2** Model and explain ways in which organelles work together to meet the cells needs.
- 5.3.6.B.1** Describe the sources of the reactants of photosynthesis and trace the pathway to the products.
- 5.3.6.B.2** Illustrate the flow of energy (food) through a community.
- 5.3.6.C.1** Explain the impact of meeting human needs and wants on local and global environments.
- 5.3.6.C.2** Predict the impact that altering biotic and abiotic factors has on an ecosystem.
- 5.3.6.C.3** Describe how one population of organism may affect other plants and/or animals in an ecosystem.
- 5.3.6.D.1** Predict the long term effect of interference with normal patterns of reproduction.
- 5.3.6.D.2** Explain how knowledge of inherited variations within and between generations is applied to farming and animal breeding.
- 5.3.6.D.3** Distinguish between inherited and acquired traits/characteristics.
- 5.3.6.E.1** Describe the impact on the survival of species during specific times in geologic history when environmental conditions changed.
- 5.4.6.G.2** Create a model of ecosystems in two different locations, and compare/contrast the living and nonliving components.
- 5.4.6.G.3** Describe ways that humans can improve the health of ecosystems around the world.

## **BIG IDEAS/COMMON THREADS**

Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life.

Matter and Energy Transformations: Food is required for energy and building cellular materials.

Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.

Heredity and Reproduction: Organisms reproduce, develop, and have predictable life cycles.

Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments.

Biogeochemical Cycles: The biogeochemical cycles in the Earth System include the flow of microscopic and macroscopic resources from one reservoir in hydrosphere, geosphere, atmosphere, or biosphere to another.

## **ENDURING UNDERSTANDINGS**

Cells are made up of many organelles.

Humans impact the local and global environment and improve the health of ecosystems

The process of natural selection means survival fittest. Heredity explains the differences between inherited and acquired traits (nature vs. nurture)

## **ESSENTIAL QUESTIONS**

PRIMARY: How do organisms develop and carry out the functions of the life cycle?

SECONDARY: How do organisms interact with each other in the ecosystem?

## **MODULE ASSESSMENT**

Teacher made test using the following:

Word banks, matching, fill in the blanks

Teacher observation

Biome quilt

Vocabulary quizzes

Circle of Life text and comprehension quiz

## **LESSON OBJECTIVES**

Students will be able to...

- compare living vs. nonliving things.
- create a flowchart of the process of photosynthesis.
- create a flowchart of how energy is transferred through a community.
- judge the impact of human effect on the environment.

- judge the impact that altering biotic and abiotic factors on the environment.
- explain how organisms affect other organisms.
- explain interference of normal patterns on reproductions.
- describe the process of natural selection.
- apply the survival of the fittest to farming and animal breeding.
- judge how organisms survive over time.
- compare and contrast biomes.

## **MODULE SKILLS**

Students will be able to...

- access, evaluate, and organize information from a variety of sources.
- including computer materials.
- work effectively in cooperative groups.
- construct models.
- communicate information and data in charts and graphs.

## **RESOURCES** [Page 63](#)

# SCIENCE CURRICULUM

## FIFTH GRADE – ATMOSPHERE

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### STATE STANDARD

- 5.1.8.A.3** Use scientific principles and models to frame and synthesize scientific arguments and pose theories.
- 5.1.8.B.2** Gather, evaluate and represent evidence using scientific tools, technologies, and computational strategies.
- 5.1.8.B.3** Use qualitative and quantitative evidence to develop evidence based arguments.
- 5.1.8.B.4** Use quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
- 5.1.8.C.2** Revise predictions or explanations on the basis of discovering evidence, learning new information, or using models.
- 5.1.8.C.3** Generate new and productive questions to evaluate and refine core explanations.
- 5.4.6.A.1** Generate and analyze evidence (through simulations) that the sun's apparent motion across the sky changes over the course of a year.
- 5.4.6.A.2** Construct and evaluate models demonstrating the rotation of Earth on its axis and the orbit of Earth around the Sun.
- 5.4.6.F.1** Explain the interrelationships between daily temperature, air pressure, and relative humidity data.
- 5.4.6.F.2** Create climatographs for various locations around Earth and categorize the climate based on the yearly patterns of temperature and precipitation.
- 5.2.6.C.1** Predict the path of reflected or refracted light using reflecting and refracting telescopes as examples.
- 5.2.6.C.2** Describe how prisms can be used to demonstrate that visible light from the Sun is made up of different colors.
- 5.2.6.C.3** Relate the transfer of heat from oceans and land masses to the evolution of a hurricane.
- 5.4.6.E.1** Generate a conclusion about energy transfer and circulation by observing a model of convection currents.

### BIG IDEAS/COMMON THREADS

**Objects in the Universe:** Our Universe has been expanding and evolving for 13.7 billion years under the influence of gravitational and nuclear forces.

**Weather and Climate:** Earth's weather and climate system are the result of complex interactions between land, ocean, ice and atmosphere.

**Forms of Energy:** Including potential and kinetic energy are useful to explain predictable outcomes.

**Energy in Earth Systems:** Internal and external sources of energy drive the Earth system.

## **ENDURING UNDERSTANDINGS**

The change in the Sun's motion during the year.  
The Earth's process of rotation and revolving around the Sun..  
The interrelationship between temperature, air pressure and humidity.  
The yearly patterns of temperature and precipitation in various locations across the Earth.  
The layers of the atmosphere

## **ESSENTIAL QUESTIONS**

PRIMARY: How does the position of the Sun affect the Earth?  
SECONDARY: What is the interrelationship between temperature, air pressure and humidity?

## **MODULE ASSESSMENT**

3-D View labs and evaluation questions  
Teacher created comprehension tests  
Quizzes  
Create a model of the causes of seasons.  
Webquests

## **LESSON OBJECTIVES**

Students will be able to...

- compare and contrast rotation and revolution of the Earth.
- judge how the Sun's motion changes during the year.
- describe the effect of gravity on an orbiting object.
- explain the characteristics of objects in the Solar System.
- evaluate the interrelationship between temperature, air pressure and humidity.
- compare and contrast the various climates on Earth based on the Sun's position.

## **MODULE SKILLS**

Students will be able to...

- access, evaluate, and organize information from a variety of sources including computer materials.
- work effectively in cooperative groups.
- construct models.
- communicate information and data in charts and graphs.

## **RESOURCES** [Page 63](#)

# SCIENCE CURRICULUM

## FIFTH GRADE – CHEMISTRY

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### STATE STANDARD

- 5.1.8.A.1 Demonstrate understanding and use interrelationships among central scientific concepts to revise explanations and to consider alternative explanations.
- 5.1.8.A.2 Use mathematical, physical, and computational tools to build conceptual-based models and to pose theories.
- 5.1.8.A.3 Use scientific principles and models to frame and synthesize scientific arguments and pose theories.
- 5.1.8.B.1 Design investigations and use scientific instrumentation to collect, analyze, and evaluate evidence as part of building and revising models and explanations.
- 5.1.8.B.2 Gather, evaluate, and represent evidence using scientific tools, technologies, and computational strategies.
- 5.1.8.B.3 Use qualitative and quantitative evidence to develop evidence-based arguments.
- 5.1.8.B.4 Use quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations
- 5.1.8.C.1 Monitor one's own thinking as understandings of scientific concepts are refined.
- 5.1.8.C.2 Revise predictions or explanations on the basis of discovering new evidence, learning new information, or using models
- 5.1.8.C.3 Generate new and productive questions to evaluate and refine core explanations.
- 5.1.8.D.1 Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
- 5.1.8.D.2 Engage in productive scientific discussion practices during conversations with peers, both face-to-face and virtually, in the context of scientific investigations and model-building
- 5.1.8.D.3 Demonstrate how to safely use tools, instruments, and supplies.
- 5.2.6.A.1 Determine the volume of common objects using water displacement methods.
- 5.2.6.A.2 Calculate the density of objects of substances after determining volume and mass.
- 5.2.6.A.3 Determine the identity of an unknown substance using data about intrinsic properties.
- 5.2.6.B.1 Compare the properties of reactants with the properties of the products when two or more substances are combined and react chemically.
- 5.2.6.E.4 Predict if an object will sink or float using evidence and reasoning.

## **BIG IDEAS/COMMON THREADS**

Properties of Matter: All objects and substances in the natural world are composed of matter.

Changes in Matter: Substances can undergo physical or chemical changes to form new substances.

Forces and Motion: It takes energy to change the motion of objects.

## **ENDURING UNDERSTANDINGS**

When materials interact within a closed system, the total mass of the system remains the same.

Changes take place because of the transfer of energy.

Energy is transferred to matter through the action of forces.

Different forces are responsible for the transfer of the different forms of energy.

The structures of materials determine their properties.

## **ESSENTIAL QUESTIONS**

PRIMARY: How does energy effect the three states of matter?

SECONDARY: How does matter undergo physical and chemical changes?

## **MODULE ASSESSMENT**

Teacher created tests

Hands-on labs

Quizzes

## **LESSON OBJECTIVES**

Students will be able to...

- describe matter by determining its physical properties including mass, volume and density.
- judge whether matter is made up of tiny particles in constant motion.
- compare and contrast between an element and a compound.
- separate mixtures into their component parts.
- compare and contrast between a solution and an alloy.
- differentiate between physical and chemical changes.
- work with indicators to identify acids and bases.
- observe and analyze chemical reactions.

## **MODULE SKILLS**

Students will be able to...

- access, evaluate, and organize information from a variety of sources including computer materials.
- work effectively in cooperative groups.
- construct models.
- communicate information and data in charts and graphs.

## **RESOURCES** [Page 63](#)

# SCIENCE CURRICULUM

## FIFTH GRADE – ASTRONOMY

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### STATE STANDARD

- 5.1.8.A.1 Demonstrate understanding and use interrelationships among central scientific concepts to revise explanations and to consider alternative explanations.
- 5.1.8.B.2 Gather, evaluate, and represent evidence using scientific tools, technologies, and computational strategies
- 5.1.8.C.1 Monitor one's own thinking as understandings of scientific concepts are refined.
- 5.1.8.C.2 Revise predictions or explanations on the basis of discovering new evidence, learning new information, or using models.
- 5.1.8.C.3 Generate new and productive questions to evaluate and refine core explanations.
- 5.1.8.D.1 Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences
- 5.1.8.D.2 Engage in productive scientific discussion practices during conversations with peers, both face-to-face and virtually, in the context of scientific investigations and model-building.
- 5.4.6.A.1 Generate and analyze evidence (through simulations) that the sun's apparent motion across the sky changes over the course of a year.
- 5.4.6.A.2 Construct and evaluate models demonstrating the rotation of Earth on its axis and the orbit of Earth around the Sun.
- 5.4.6.A.3 Predict what would happen to an orbiting object if gravity were increased, decreased, or taken away.
- 5.4.6.A.4 Compare and contrast the major physical characteristics (including size and scale) of solar system objects using evidence in the form of data tables and photographs.
- 5.2.6.C.1 Predict the path of reflected or refracted light using reflecting and refracting telescopes as examples.
- 5.2.6.C.2 Describe how prisms can be used to demonstrate that visible light from the Sun is made up of different colors.
- 5.2.6.E.1 Model and explain how the description of an object's motion from one observer's view may be different from a different observer's view.

### BIG IDEAS/COMMON THREADS

Forms of Energy: Knowing the characteristics of familiar forms of energy, including potential and kinetic energy, is useful in coming to the understanding that, for the most part, the natural world can be explained and is predictable.

Forces and Motion: It takes energy to change the motion of objects. The energy change is understood in terms of forces.

Objects in the Universe: Our Universe has been expanding and evolving for 13.7 billion years under the influence of gravitational and nuclear forces.

## **ENDURING UNDERSTANDINGS**

Change in the Sun's motion during the year affect seasons, weather, climate, day/night.

Gravity has an effect on orbiting objects.

The Solar System contains objects, each having unique characteristics.

## **ESSENTIAL QUESTIONS**

PRIMARY: What are the main components of the solar system?

SECONDARY: How does the position of the Sun affect the Earth?

## **MODULE ASSESSMENT**

3-D View labs and evaluation questions

Teacher created comprehension tests

Quizzes

Create a model of the causes of seasons.

Webquests

## **LESSON OBJECTIVES**

Students will be able to...

- compare and contrast rotation and revolution of the Earth.
- judge how the Sun's motion changes during the year.
- describe the effect of gravity on an orbiting object.
- explain the characteristics of objects in the Solar System.
- compare and contrast the various climates on Earth based on the Sun's position.

## **MODULE SKILLS**

Students will be able to...

- access, evaluate, and organize information from a variety of sources including computer materials.
- work effectively in cooperative groups.
- construct models.
- communicate information and data in charts and graphs.

## **RESOURCES** [Page 63](#)

# RESOURCES

## KINDERGARTEN

### FIVE SENSES

SUPPLIES: thermometer, magnifying glasses, rocks, sand, water, music, scales, sugar, salt, measuring cups/spoons

VIDEO: “An Alphabet of Science” dvd set (Phoenix Learning Group)

WEBSITES: <http://www.brainpopjr.com/science/scienceskills/>  
[http://www.internet4classrooms.com/kplus\\_subjects\\_science.htm](http://www.internet4classrooms.com/kplus_subjects_science.htm)

LITERATURE: *My Five Senses* by Alikei, *The Five Senses* by Nuria Roca and Rosa M. Curto, *What is a Scientist?* By Barbara Lehn, *How to Think Like a Scientist* by Stephen Kramer and Felicia Bond

PROFESSIONAL REFERENCES: *Taking Science to School: Learning and Teaching Science to grades K-8* Robert A Duschl

### SOLIDS AND LIQUIDS

SUPPLIES: Measuring cups/spoons, scales, various materials for experimenting properties of matter (rocks, sand, oil, vinegar, heat lamps, water, hot plate, paint)

VIDEO: What are Solids Liquids and Gases

WEBSITES: <http://www.education.com/worksheet/article/solid-liquid-gas/>  
<http://www.neok12.com/States-of-Matter.htm>  
[http://www.internet4classrooms.com/kplus\\_subjects\\_science.htm](http://www.internet4classrooms.com/kplus_subjects_science.htm)  
<http://www.brainpopjr.com/science/matter/>

TECHNOLOGY: use Kidspiration to make a web

LITERATURE: *Snowballs* by Lois Ehlert, *Melting* by Faye Bolton, *What is Matter* by Lisa Trumbauer, *From Peanuts to Peanut Butter* by Melvin Berger, *Solid Liquid or Gas* by Fay Robinson, *The Snowy Day* by Ezra Jack Keats

### ENERGY AND MOTION

SUPPLIES: ramp, blocks, musical instruments, magnets, scales, magnifying glasses, heat lamps, marbles, pan balance

VIDEO: How Things Move

WEBSITES: <http://www.brainpopjr.com/science/energy/>  
<http://classroom.jc-schools.net/sci-units/force.htm>  
[http://www.internet4classrooms.com/kplus\\_subjects\\_science.htm](http://www.internet4classrooms.com/kplus_subjects_science.htm)

LITERATURE: *Motion and Speed, Pushing and Pulling, Back And Forth- The Way Things Move Series* by Lola M. Scafer

### ANIMALS – LIVING THINGS

SUPPLIES: Seeds, Plants, Soil, Cup and holders, Pictures of habitats, pictures showing various life cycles.

## **PLANTS**

### **KITS/LABS/ LESSON PLANS:**

<http://www.kinderplans.com/content.cfm?pageid=169>

<http://atozteacherstuff.com/pages/343.shtml>

<http://www.kinderplans.com/content.cfm?pageid=169>

### **TEXTS/ BOOKS:**

*The Tiny Seed* by Eric Carle

*The Popcorn Book* by T. De Paola

*From Seed to Plant* by Gail Gibbons

*Seeds* by Ken Robbins

*Beans* by Terry Jennings

*Anna in the Garden* by Diane Hearn

*The Green Man* by Gail Haley

*The Pea Patch Jig* by Thatcher Hurd

*Sunflower House* by Eve Bunting

*A Weed is a Seed-* by Feida Wolff

*From Seed to Plant* by Gail Gibbons

*Flowers, Fruits, Seeds* by Jerome Wexler

*Planting a Rainbow* by Lois Ehlert

*The Giving Tree* by Shel Silverstein

*The Carrot Seed* by Ruth Kraus

*The Flower Alphabet Book* by Jerry Pallota

*The Life Cycle of a Flower* by Molly Aloian

### **VIDEO:**

[http://www1.teachertube.com/viewVideo.php?video\\_id=134153](http://www1.teachertube.com/viewVideo.php?video_id=134153)

[http://www1.teachertube.com/viewVideo.php?title=Wisconsin\\_Fast\\_Plants\\_Life\\_Cycle\\_Time\\_Lapse&video\\_id=11178](http://www1.teachertube.com/viewVideo.php?title=Wisconsin_Fast_Plants_Life_Cycle_Time_Lapse&video_id=11178)

### **WEBSITES/ WEBQUEST:**

<http://www.its.guilford.k12.nc.us/webquests/plants/plants1.htm>

<http://www.w4.nksd.k12.mo.us/~ebryant/oldwebpage/webquest.html>

## **ANIMALS**

### **KITS/LABS/ LESSON PLANS:**

<http://classroom.jc-schools.net/sci-units/plants-animals.htm>

<http://school.discovery.com/lessonplans/programs/animalsAroundUs>

<http://school.discovery.com/lessonplans/programs/animalColorsShapes/>

<http://www.coreknowledge.org/CK/resrcs/lessons/K.htm>

### **TEXTS/BOOKS:**

*Animal Life Cycle: Growing and Changing* by Bobbie Kalman

*Life Cycles* by Michael Ross and Gustav Moore

*Chicken (Life Cycle)* by David M. Schwartz

### **WEBSITES/ WEBQUEST:**

<http://www.ottawaelem.lasall.k12.il.us/OES%20folder/OES/OES%20Webquest%202002/>

[Central2002/Hartman%20quest/Hartman.html](#)

<http://projects.edtech.sandi.net/brooklyn/animals/>

<http://warrensburg.k12.mo.us/webquest/frogs/index.htm>  
<http://aldertrootes.wcpss.net/farmanimalsa.html>

## **LIVING AND NONLIVING THINGS**

KITS/LABS/ LESSON PLANS:

<http://classroom.jc-schools.net/sci-units/living-things.htm>

<http://www.instructorweb.com/lesson/livingthings.asp>

<http://www.brighthub.com/education/k-12/articles/56967.aspx>

TEXTS/BOOKS:

*Is It a Living Thing? (Introducing Living Things)* By Bobbie Kalman

*Living and Nonliving* by Lindeen and Carol K.

*What Is a Living Thing?* By Bobbie Kalman

*I Am a Living Thing* by Bobbie Kalman

VIDEO:

[http://www.teachersdomain.org/resource/tdc02.sci.life.colt.lp\\_living/](http://www.teachersdomain.org/resource/tdc02.sci.life.colt.lp_living/)

WEBSITES/ WEBQUEST:

## **HABITAT**

KITS/LABS/ LESSON PLANS:

<http://school.discoveryeducation.com/lessonplans/programs/animalsAroundUs/>

TEXTS/BOOKS:

*A Forest Habitat* by Bobbie Kalman

*A Desert Habitat* by Kelley Macaulay

*Water Habitats* by Molly Aloian

*A Rainforest Habitat* by Molly Aloian

*A Grassland Habitat* by Kelley Macaulay

*The Artic Habitat* by Molly Aloian

VIDEO:

[http://www.teachertube.com/viewVideo.php?video\\_id=119441](http://www.teachertube.com/viewVideo.php?video_id=119441)

## **EARTH MATERIALS – NON-LIVING**

SUPPLIES: Rocks, soil, water, non-living objects, recyclable materials

## **WEATHER**

KITS/LABS/ LESSON PLANS:

[http://www.weatherworks.com/monthly/activities/sky\\_window.html](http://www.weatherworks.com/monthly/activities/sky_window.html)

<http://www.uen.org/Lessonplan/preview.cgi?LPid=613>

<http://www.uen.org/Lessonplan/preview.cgi?LPid=628>

<http://www.libsci.sc.edu/miller/Weather.htm>

TEXTS/BOOKS:

*All Weather Friends* by Udo Weifelt

*Before the Storm* by Jane Yolen

*Blizzards (Facts on File Dangerous Weather Series)* by Michael Allaby

*All the Colors of the Rainbow* by Allan Fowler

*Can You See the Wind?* by Allan Fowler

*The Cloud Book* by Tomie De Paola

*Cloudy With a Chance of Meatballs* by Judith Barrett, Judi Barrett, Ron Barrett  
(Illustrator)

*Corey's Kite (My First Weather Book)* by Hannah Roche, Pierre Pratt (Illustrator)

*Experiment With Weather* by Miranda Bower

VIDEO:

<http://player.discoveryeducation.com/index.cfm?guidAssetId=B0B2C97D-1FCD-4839-A910-F66968C50F1A&blnFromSearch=1&productcode=US>

WEBSITES/ WEBQUEST:

<http://warrensburg.k12.mo.us/webquest/weather/index.htm>

<http://www.weatherunderground.com>

<Http://www.weather.com>

<http://www.nws.noaa.gov/om/reachout/kidspage.shtml>

<http://www.kathimitchell.com/weather.htm>

## **RECYCLE**

KITS/LABS/ LESSON PLANS:

<http://atozteacherstuff.com/Themes/Recycling/>

<http://www.theteachersguide.com/earthdaylessonplans.htm>

<http://www.proteacher.com/110005.shtml>

[http://www.dep.state.pa.us/dep/deputate/enved/Rec\\_lessons/contents.htm](http://www.dep.state.pa.us/dep/deputate/enved/Rec_lessons/contents.htm)

TEXTS/BOOKS:

*Recycle!* by Gail Gibbons

*Where does the garbage go?* by Paul Showers

*Re-cycle* by Michael Elsohn Ross

*Earth Day – hooray!* by Stuart J. Murphy

*Don't Throw That Away!: A Lift-the-Flap Book about Recycling and Reusing* by Lara Bergen

*The Adventures of an Aluminum Can: A Story About Recycling* by Alison Inches and Mark Chambers

*Recycle!* By Gail Gibbons

*The Adventures of a Plastic Bottle: A Story about Recycling* by Alison Inches and Pete Whitehead

*I Can Save the Earth! One Little Monster Learns to Reduce, Reuse, and Recycle* by Alison Inches and Viviana Garofoli

*The Three R's: Reduce, Reuse, Recycle* by Nuria Roca and Rosa M. Curto

*Michael Recycle* by Ellie Bethel

*Why Should I Recycle?* By Jen Green

*Michael Recycle Meets Litterbug Doug* by Ellie Bethel

*Michael Recycle Saves Christmas* by Ellie Bethel

*Why Should I Save Energy?* By Jen Green

*Why Should I Save Water?* By Jen Green

WEBSITES/ WEBQUEST:

<http://www.pbs.org/parents/eeeworld/lessons.html>

## **EARTH MATERIALS**

KITS/LABS/ LESSON PLANS:

<http://classroom.jc-schools.net/sci-units/resources.htm>

## **EARTH SYSTEMS (SUN)**

KITS/LABS/ LESSON PLANS:

<http://classroom.jc-schools.net/sci-units/food.htm>

## **FIRST GRADE**

### **INSECTS**

Enrichment Assembly – Rick Mikula from Hole in Hand Butterfly Farm

Live caterpillars and butterfly home (13 – 1 for each tri-district teacher)

TEXTS/BOOKS:

*Butterflies and Moths*

*The Very Hungry Caterpillar* by Eric Carle

*The Grouchy Ladybug* by Eric Carle

*The Ladybug and Other Insects* by Pascale de Bourgoing

*When It Comes to a Bug-* by Aileen Fisher

*I Wish I Were a Butterfly* by James Howe

*The Caterpillar* by Christina Rosetti

*Where Butterflies Grow* by Joanne Ryder

*The Tenth Good Thing About Barney* by Judith Viorst

*Are You A Butterfly?* by Judy Allen

*Butterfly House* by Eve Bunting

*The Clumsy Click Beetle* by Eric Carle

*Butterfly Buddies* by Judy Cox

*Clara Caterpillar* by Pamela Duncan Edwards

*Waiting for Wings* by Lois Ehlert

*Insectlopedia* by Doug Florian

*The Caterpillar and the Polliwog* by Jack Keats

*Charlie and the Catterpillar* by Dom Deluise

*Becoming a Butterfly* Scholastic Literacy Place

WEBSITES/WEBQUESTS:

<http://projects.edtech.sandi.net/grant/insects/>

<http://www.urbanext.uiuc.edu/insects/01.html>

<http://projects.edtech.sandi.net/lvelem/butterflies/>

<http://projects.edtech.sandi.net/encanto/justwingingit/>

<http://www.yorkville.k12.il.us/webquests/webqfrey/webqsfrey.html>

<http://its.guilford.k12.nc.us/webquests/insects/insects.htm>

<http://www.geocities.com/EnchantedForest/Tower/1217/barb.html#a>

<http://www.butterflyschool.org/student/>

### **ECOSYSTEMS**

Enrichment Assembly – specialist

TEXTS/BOOKS:

Oradell, River Dell and River Edge Public School Districts  
Science Curriculum – K -5  
Approved June 22, 2011

*The Great Kapok Tree*  
*Rain Forest*  
*Rain Forest Homes*

**Websites/Webquest:**

Oceans

<http://projects.edtech.sandi.net/grant/aquarium/index.html>

<http://projects.edtech.sandi.net/valencia/oceanabcbooks/>

Rainforest

<http://its.guilford.k12.nc.us/webquests/rforest/rforest.htm>

**BALANCE AND MOTION**

**SUPPLIES**

Balance and Motion Foss Kits 742-5015-591

**TEXTS/BOOKS**

*Force and Motion*

*Where is it? Is it moving?*

*The Changing Earth* (131120)

*Fly Like Superhero?* (143688)

*Gravity: Simple Experiments for Young Scientists* (130910)

*If You Had a Tail* (144032)

*Keeping Your Balance* (128758)

*Mechanical Harry* (138232)

*Motion and Speed* (131448)

*Pushing and Pulling* (131772)

*Back And Forth- The Way Things Move Series* by Lola M. Scafer

*Balance And Motion* by Lisa Trumbaureer

*Forces Around Us* by Sally Hewitt

*Make It Balance* by David Evans

*On The Move* by Wendy Madgwick

*Wheels* by Annoe Cobb

*High-Wire Henry* by Mary Calhoun

*Mirette On The High Wire* by Emily Arnold

*Up And Down The Merry-Go-Round* By Bill Martin Jr.

**WEBSITES/WEBQUESTS:**

<http://web.archive.org/web/20041010111656/http://www.davison.k12.mi.us/elementary/balance.htm>

<http://www.sci.mus.mn.us/sln/tf/b/balance/balance.html>

<http://www.smm.org/sln/vollis/trythese/trythese.html>

[www.fossweb.com/modulesK-2/BalanceandMotion/index.html](http://www.fossweb.com/modulesK-2/BalanceandMotion/index.html)

**WEATHER AND SEASONS**

**TEXTS/BOOKS**

*Water Cycle*

*Weather Instruments*

*Watching Weather*

*Investigating Water*

*Sunshine and Shadows*

*Sky*

WEBSITES/WEBQUESTS:

<http://cse.ssl.berkeley.edu/first/EyeontheSkyWeatherJournal/>

<http://www.bbc.co.uk/schools/whatisweather/aboutweather/cloud.shtml>

<http://teacher.scholastic.com/activities/wwatch/observe.htm>

## **OBJECTS IN THE SKY**

TEXTS/BOOKS

*Skywatchers Building Blocks of Science* 978-1-4350-0000-1

*How the Stars Fell into the Sky: A Navajo Legend* Lisa Desimini

*Magic School Bus Sees Stars: A Book about Stars* Nancy White, Art Ruiz, Scholastic Books

*Louis and the Night Sky* by Nicola Morgan

WEBSITES/WEBQUESTS:

[www.thenightskyguy.com](http://www.thenightskyguy.com)

[www.onr.navy.mil/focus/spacesciences/observingsky/sun2](http://www.onr.navy.mil/focus/spacesciences/observingsky/sun2).

[www.astronomyonline.org/Observation/NightSky.asp](http://www.astronomyonline.org/Observation/NightSky.asp)

Star Lab

## **SECOND GRADE**

### **PLANTS**

TEXTS/BOOKS

*The Magic School Bus Plants Seeds: A Book About How Living Things Grow*

*The Tiny Seed*

*Oh Say Can You Seed? All About Flowering Plants*

*City Green*

VIDEO: *Magic School Bus Goes to Seed, Discovery: The Life of a Plant*

WEBSITES:

<http://www.urbanext.uiuc.edu/gpe/>

<http://www.bbc.co.uk/schools/ks2bitesize/index.shtml>

<http://www.spart5.k12.sc.us/techtraining/teacher/webpages/Plantweb/index.htm>://<http://www.hhmi.org/coolscience/vegquiz/index.html>

The Great Plant Escape- <http://urbanext.illinois.edu/gpe/case1/c1facts2a.html>

<http://urbanext.illinois.edu/gpe/case1/c1m1app.html>

Webquest- <http://www.todaysteacher.com/PartsIsParts.htm>

Parts of the Plant Activity-

<http://www.hhmi.org/coolscience/forkids/vegquiz/plantparts.html>

TECHNOLOGY: See Web Quests Above

LITERATURE:

*The Magic School Bus Plants Seeds: A Book About How Living Things Grow*

*The Tiny Seed*

*Oh Say Can You Seed? All About Flowering Plants*

*City Green*

## PROFESSIONAL REFERENCES:

Foss Teacher's Manual

Foss Plant Text

Supplies: Soil, seeds (different kinds), cups, fertilizer, green house

## MATTER

### BOOKS/TEXTS:

*Weather Words and What They Mean* by Gail Gibbons

*The Four Elements Earth* by Carme Sole Vendrell and J. M. Parramon

*Snowballs* by Lois Ehlert

*Rain* by Peter Spier

*Melting* by Faye Bolton

*How to Grow Crystals* by Honey Anderson

*Solids, Liquids, and Gases* developed by New York Hall of science

*Bubbles, Bubbles Everywhere* by Dwight Kuhn and Melvin Berger

*Amazing Water* by Melvin Berger

*It's Melting!* by Rozanne Lanczak Williams

*From Peanuts to Peanut Butter* by Melvin Berger

*What is Matter* by Lisa Trumbauer

*Make Mine Ice Cream* by Melvin Berger

*The Cloud Book* by Tomie de Paola

*What Makes the Weather* by Janet Palazzo

*What Makes It Rain? The Story of a Raindrop* by Keith Brandt

*What is the World Made of? All About Solids, Liquids and Gases* by Kathleen Zoehfeld

*Is It Rough? Is It Smooth? Is It Shiny* by Tana Hoban

*Solid Liquid or Gas* by Fay Robinson

*Bartholomew and the Oobleck* by Dr. Suess

*Galimoto* by Karen Lynn Williams

*The Quicksand Book* by Suzy Kline

*The Snowy Day* by Ezra Jack Keats

*The Wise Women and Her Secret* by Eve Merriam

### LITERATURE:

*What is the world made of? All About Solids, Liquids, and Gases.* by Kathleen Weidner Zoefeld

*Sadie and the Snowman* by Allen Morgan and Brenda Clark

*Touch It! Matter and You (Primary Physical Science)* by Adrienne Mason

*Change it!: Solids, Liquids, Gases and You (Primary Physical Science)* by Adrienne Mason

### VIDEO:

United Streaming-

Properties of Matter, Part 1 -

<http://player.discoveryeducation.com/index.cfm?guidAssetId=6BAA6AFA-8229-4AAF-AFD9-01EC31E9FD05&blnFromSearch=1&productcode=US>

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

<http://player.discoveryeducation.com/index.cfm?guidAssetId=83A4FF97-57E2-4073-96C5-ED75AC5223CD&blnFromSearch=1&productcode=US>

#### WEBSITES:

Solids, Liquids and Gases-

<http://www.brainpopjr.com/science/matter/solidliquidsandgases/>

States of Matter-<http://www.brainpopjr.com/science/matter/changingstatesofmatter/>

Sink or Float- <http://www.brainpopjr.com/science/forces/sinkorfloat/>

Heat- <http://www.brainpopjr.com/science/energy/heat/>

Changing States Activity-

[http://www.bbc.co.uk/schools/ks2bitesize/science/materials/changing\\_state/play.shtml](http://www.bbc.co.uk/schools/ks2bitesize/science/materials/changing_state/play.shtml)

Scholastic- States of Matter

[http://teacher.scholastic.com/activities/studyjams/matter\\_states/](http://teacher.scholastic.com/activities/studyjams/matter_states/)

FOSSweb- Solids & Liquids-

<http://www.fossweb.com/modulesK-2/SolidsandLiquids/index.html>

#### TECHNOLOGY:

Smartboard Lesson- States of Matter

<http://exchange.smarttech.com/details.html?id=x4d2386c37bc64db3bcec4e1fff165535>

Slideshow incorporating 3 slides formatted text and pictures.

#### PROFESSIONAL REFERENCES:

States of Matter Delta Science Reader, Delta Education

Experiments with Solids, Liquids, and Gases by Salvatore Tocci

#### SUPPLEMENTAL SUPPLIES:

Delta DSM III States of Matter- Complete Kit

<http://www.delta->

[education.com/productdetail.aspx?Collection=Y&prodID=1118&menuID=](http://www.delta-education.com/productdetail.aspx?Collection=Y&prodID=1118&menuID=)

Differentiated Book pack- What is Matter? Levels H, J, L

[http://www.newbridgeonline.com/c/@z\\_u1bgq3GdOTo/Pages/product.html?record@P4925+from@resltable](http://www.newbridgeonline.com/c/@z_u1bgq3GdOTo/Pages/product.html?record@P4925+from@resltable)

## LIGHT

#### TEXTS/BOOKS:

*Moonbear's Shadow* by Frank Asch

*Shadows and Reflections* by Tana Hoban

*What Makes a Shadow?* By Clyde Robert Bulla

*Nothing Sticks Like a Shadow* by Ann Tompert

*Light: Shadows, Mirrors, and Rainbows* By Natalie M. Rosinsky

*Day Light, Night Light: Where Light Comes From* By Franklyn M. Branley

#### VIDEO

United Streaming Video

<http://player.discoveryeducation.com/index.cfm?guidAssetId=3A79C890-3B3E-44A7-AF6B-2E3B1ADCC81E&blnFromSearch=1&productcode=US>

Light Video- United Streaming

<http://player.discoveryeducation.com/index.cfm?guidAssetId=300D8CDE-2D0B-4869-9931-DAEF414237F3&blnFromSearch=1&productcode=US>

My Shadow Video

<http://player.discoveryeducation.com/index.cfm?guidAssetId=3A79C890-3B3E-44A7-AF6B-2E3B1ADCC81E&blnFromSearch=1&productcode=US>

WEBSITES:

## **HEAT AND LIGHT**

### **SUPPLIES**

Flashlights, mirrors, tennis balls, overhead projector, butcher paper

### **WEBSITES**

<http://www.teachervision.fen.com/heat/printable/32151.html>

Shadows and light (worksheet)

<http://www.teachervision.fen.com/light-and-color/printable/32144.html>

Light (Video)

<http://www.brainpopjr.com/science/energy/light>

Reflection and Light

<http://www.teachervision.fen.com/light/printable/45018.html>

### **TECHNOLOGY:**

Kidpix program

smart board Lessons for light:

<http://exchange.smarttech.com/details.html?id=x0126efcb27c44723b391a6fe4ac90fbd>

<http://exchange.smarttech.com/details.html?id=xa2e17986196348029bd5492cff05403f>

<http://exchange.smarttech.com/details.html?id=x949ab47b36a54e5387114f401d151ab6>

<http://www.rockingham.k12.va.us/resources/elementary/kscience.htm#7research>

## **SOIL**

### **TEXTS/BOOKS:**

*The Quicksand Book* by Tomie DePaola

*Dirt: The Scoop on Soil* By Natalie M. Rosinsky

*Wiggling Worms at Work* by Wendy Pfeffer

*Composting: Nature's Recyclers* by Robin Koontz

*Soil Habitats* (Delta Education Foundation)

### **VIDEO:**

Magic School Bus: The Rot Squad

<http://video.nationalgeographic.com/video/player/environment/going-green-environment/green-home-makeover/compost-gg.html>

### **WEBSITES:**

[www.brainpop.com](http://www.brainpop.com)

<http://www.growingthenextgeneration.com/just-for-kids-videos.html>

<http://tlc.howstuffworks.com/family/science-projects-for-kids-soil-experiments.htm>

<http://www.benefits-of-recycling.com/compostingforkids.html>

<http://www.fossweb.com/modulesK-2/PebblesSandandSilt/index.html>

### **TECHNOLOGY:**

<http://www.can-do.com/uci/ssi2001/soilandworms.html>

<http://www.ecps.k12.nc.us/dfw/ebaker/SoilWebquest.htm>

<http://www.ecps.k12.nc.us/dfw/ebaker/Composting.htm>

[http://eats.ecsd.net/curricular/webquest/waste\\_world/](http://eats.ecsd.net/curricular/webquest/waste_world/)

## PROFESSIONAL REFERENCES:

*Worms Eat My Garbage* by Mary Appelhof

*Soil: A Hands-On, Minds-On Approach* (McGraw Hill Children's Publishing)

Soil (various types- sand, clay, etc.), Worms, Composting Materials, Compost

Receptacle, shovels, pails (or digging tools), magnifying glasses, tweezers

Delta Education- Soil Habitats Kit (\$1,095.00)

<http://www.delta-education.com/productdetail.aspx?campID=D610&PartNo=794-0001>

DSM II Soil Science Kit- (\$379)

[http://www.delta-](http://www.delta-education.com/productdetail.aspx?Collection=Y&prodID=1120&menuID=)

[education.com/productdetail.aspx?Collection=Y&prodID=1120&menuID=](http://www.delta-education.com/productdetail.aspx?Collection=Y&prodID=1120&menuID=)

## THIRD GRADE

### ECOSYSTEMS

#### SUPPLIES

FOSS kits-structures of living things

TEXTS/BOOKS: *Harcourt*

VIDEO: <http://www.brainpop.com/science/ecologyandbehavior/foodchains/>

<http://streaming.discoveryeducation.com/>

WEBSITES: <http://www.internet4classrooms.com/>

<http://scilinks.org/harcourt/Default.aspx>

<http://www.si.edu/>

#### TECHNOLOGY:

Smartboard

<http://exchange.smarttech.com/search.html?q=food%20chains>

#### WEBSITES:

[http://www.teachnet-lab.org/glasgold/food\\_chain/introduction.htm](http://www.teachnet-lab.org/glasgold/food_chain/introduction.htm)

### MAGNETS

SUPPLIES: science kits, FOSS kits

TEXTS/BOOKS: *Harcourt science books*

*Delta Education- Seeds of Science/ Roots of Reading*

*Gravity and Magnetism*

*Forces*

*What my sister taught me about magnets*

*Gravity is Everywhere*

*Mystery Forces*

VIDEO: <http://www.brainpop.com/science/motionsforcesandtime/magnetism/>

WEBSITES: <http://www.internet4classrooms.com/>

<http://www.pawlingschools.org/webpages/jgillotti/web.cfm?subpage=409318>

National Science Digital Library, Science Digital Literacy Maps: The Physical Setting:

[Laws of Motion](#)

<http://strandmaps.nsdL.org/?id=SMS-MAP-1357>

National Science Digital Library, [Science Refreshers](#)

<http://nsdl.org/refreshers/science/>

Science Curriculum Topic Study

Oradell, River Dell and River Edge Public School Districts

Science Curriculum – K -5

Approved June 22, 2011

Laws of Motion, p. 218

## **EARTH SUN MOON**

SUPPLIES: star lab, flashlights

TEXTS/BOOKS: *Harcourt science books*

VIDEO: <http://www.brainpop.com/science/space/eclipse/>

<http://streaming.discoveryeducation.com/>

WEBSITES: [www.earthsunmoon.uk.co/](http://www.earthsunmoon.uk.co/), Explore the Universe with The Night Sky Guy

TECHNOLOGY:

Smartboard :

<http://exchange.smarttech.com/search.html?q=moon>

Webquest:

<http://www.murray.k12.ga.us/staci/moonphases.htm>

National Science Digital Library, Science Digital Literacy Maps

Common Themes: Patterns of Change

<http://strandmaps.nsd.org/?id=SMS-MAP-2436>

The Physical Setting: Solar System

<http://strandmaps.nsd.org/?id=SMS-MAP-1282>

National Science Digital Library, [Science Refreshers](#)

<http://nsdl.org/refreshers/science/>

Science Curriculum Topic Study

Seasons p. 185; Earth, Moon, and Sun System, p. 194

National Science Digital Library, Science Digital Literacy Maps

The Physical Setting: Gravity

<http://strandmaps.nsd.org/?id=SMS-MAP-1372>

National Science Digital Library, [Science Refreshers](#)

<http://nsdl.org/refreshers/science/>

Science Curriculum Topic Study

Earth's Gravity, p 178; Gravity in Space, p. 195

## **MATTER**

SUPPLIES: FOSS kits

VIDEO:

<http://streaming.discoveryeducation.com/>

<http://www.brainpop.com/science/matterandchemistry/matterchangingstates/>

WEBSITES:

<http://exchange.smarttech.com/search.html?tab=resources&q=states+of+matter&sbj=sc&grd=g3>

<http://www.schools.pinellas.k12.fl.us/educators/tec/Davis2/webquest.html>

<http://scorescience.humboldt.k12.ca.us/fast/teachers/Matter/matter.htm>

[Inquiry in Action: Investigating Matter through Inquiry](#), 3rd edition. Permission is granted in advance for reproduction for classroom use. Please include “Reprinted with permission from Inquiry in Action, Third Edition, Copyright © 2007, American Chemical Society.”

<http://www.inquiryinaction.org/>

National Science Digital Library, Science Digital Literacy Maps: The Physical Setting:  
[Conservation of Matter](#)

<http://strandmaps.nsd.org/?id=SMS-MAP-1332>

National Science Digital Library, [Science Refreshers](#)

<http://nsdl.org/refreshers/science/>

Science Curriculum Topic Study

Properties of Matter p. 171

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<http://www.inquiryinaction.org/>

National Science Digital Library, Science Digital Literacy Maps: The Physical Setting:  
[Conservation of Matter](#):

<http://strandmaps.nsd.org/?id=SMS-MAP-1332>

National Science Digital Library, [Science Refreshers](#)

<http://nsdl.org/refreshers/science/>

Science Curriculum Topic Study

Properties of Matter p. 171

[Inquiry in Action: Investigating Matter through Inquiry](#), 3rd edition. Permission is granted in advance for reproduction for classroom use. Please include “Reprinted with permission from Inquiry in Action, Third Edition, Copyright © 2007, American Chemical Society.”

<http://www.inquiryinaction.org/>

National Science Digital Library, Science Digital Literacy Maps: The Physical Setting:  
[Scale](#)

<http://strandmaps.nsd.org/?id=SMS-MAP-2458>

National Science Digital Library, [Science Refreshers](#)

<http://nsdl.org/refreshers/science/>

Science Curriculum Topic Study:

Density p. 164

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<http://www.inquiryinaction.org/>

National Science Digital Library, Science Digital Literacy Maps: The Physical Setting:  
[States of Matter](#)

<http://strandmaps.nsd.org/?id=SMS-MAP-1341>

National Science Digital Library, [Science Refreshers](#)

<http://nsdl.org/refreshers/science/>

Science Curriculum Topic Study

States of Matter p. 173

## **ROCKS AND MINERALS**

SUPPLIES: Foss Kits

TEXTS/BOOKS: *Earth, Sun, Moon Discover the mysteries of Stonehenge. Explore the motion of Earth and the moon in relation to the sun. Trek back to ancient times for a look at the technology of early sky- watchers. National Geographic WE41767 9781426360787 Earth, Sun, Moon 6-pack teacher guide*

VIDEO: <http://www.brainpop.com/science/earthsystem/rockcycle/>  
<http://streaming.discoveryeducation.com/>

WEBSITES: <http://www.enchantedlearning.com/subjects/astronomy/planets/>  
<http://library.thinkquest.org/J002289/>

National Science Digital Library, Science Digital Literacy Maps

The Living Environment: Biological Evolution

<http://strandmaps.nsdlib.org/?id=SMS-MAP-1430>

National Science Digital Library, [Science Refreshers](#)

<http://nsdl.org/refreshers/science/>

Science Curriculum Topic Study

Earth History, p. 176

National Science Digital Library, Science Digital Literacy Maps

The Physical Setting: Changes in the Earth's Surface

<http://strandmaps.nsdlib.org/?id=SMS-MAP-0048>

National Science Digital Library, [Science Refreshers](#)

<http://nsdl.org/refreshers/science/>

Science Curriculum Topic Study

Rocks and Minerals, p. 184; Air and Atmosphere, p 175

## **FOURTH GRADE**

### **HUMAN BODY SYSTEM**

TEXTS/BOOKS: *A World of Living Things*

VIDEO:

<http://player.discoveryeducation.com/index.cfm?guidAssetId=FACE688E-E1F3-4156-9865-55837EF38042&blnFromSearch=1&productcode=US>

<http://player.discoveryeducation.com/index.cfm?guidAssetId=7349BA53-5EF8-4FA0-8449-B971FB3F28AB&blnFromSearch=1&productcode=US>

<http://player.discoveryeducation.com/index.cfm?guidAssetId=9B4D62FC-7B62-49AF-9163-C6ACDA7435AE&blnFromSearch=1&productcode=US>

WEBSITES:

<http://www.kidskonnnect.com/subject-index/31-health/337-human-body.html>

<http://kidshealth.org/kid/>

<http://warriors.warren.k12.il.us/dburke/bodyindex.htm>

<http://www.kidskonnnect.com/subject-index/31-health/337-human-body.html>

<http://kidshealth.org/kid/htbw/heart.html#>

<http://www.enchantedlearning.com/subjects/anatomy/skeleton/Skelprintout.shtml>

<http://kidshealth.org/kid/htbw/bones.html#>

<http://www.kidsknowit.com/interactive-educational-movies/free-online-movies.php?movie=Human%20Body>

[The Five Senses - Fact Monster](#)

[A look inside the human body - Webquest](#)

[How the Body Works](#) - KidsHealth  
[Surfing Inside Your Body](#) - TThinkquest  
[Your Body's Systems](#) - Fact Monster  
[Circulatory System](#)  
[Your Heart & Circulatory System](#) - Kidshealth  
[Digestive](#) - enchanted learning  
[Digestive](#) - KidsHealth  
[Brain and Nervous](#) - KidsHealth  
[Nervous](#) - Discovery Kids  
[Your Lungs and Respiratory System](#) - KidsHealth  
[How does the respiratory system work?](#) - Helium  
[The Topic: Respiratory System](#)  
[Neuroscience for Kids](#)  
[Skeletal System](#) - Discovery Kids  
[Human Skelton printout](#) - Enchanted Learning

## **ENERGY**

### **WEBSITES:**

<http://www.edu.gov.mb.ca/k12/cur/science//found/kto4/4c3.pdf>

<http://www.sasked.gov.sk.ca/docs/elemsci/gr4ubesc.html>

### **PROFESSIONAL REFERENCES:**

1. [The Science of light - Light in color at Learner.org](#)

Activities are included to investigate light and color

2. [Make a splash with color](#)

...Talking about Color

... The Lighter Side of Color

... An Eye on Color

3. [Light and color with the Franklin Institute](#)

4. **COLOR MATTERS**

The concept of color can be approached from several disciplines: physiology, psychology, philosophy, and art.

This web site provides some starting points for an exploration of color.

5. [Seeing Exhibits from Exploritorium](#)

6. [Color Mix & Match](#) from Exploritorium

7. [Color Mixing Machine](#) - Oregon Museum

8. [Stroop Effect](#) - Chudler"s Neuroscience for Kids

## **WATER CYCLE**

*On Nature's Trail* 551.48

*Clouds* 551.5

*Cyclone: Nature at its Most Terrifying* 551.5

*Weather* 551.5

*Wonders of Weather* 551.5

*The Magic School Bus Kicks Up a Storm* 551.6

*Telling the Weather* 551.6 TELLING

*Water and Weather* 551.6 WATER

*Which Way Weather?* 551.6 WHICH

*Cracking the Ice Age* 551.7 CRACKING

WEBSITES: <http://www.easyfunschool.com/article2287.html> (alcohol thermometer)

## **FORCES AND MOTION**

National Science Digital Library, Science Digital Literacy Maps The Physical Setting:

[Laws of Motion](#)

<http://strandmaps.nsdl.org/?id=SMS-MAP-1357>

National Science Digital Library, [Science Refreshers](#)

<http://nsdl.org/refreshers/science/>

Science Curriculum Topic Study

Laws of Motion, p. 218

## **FIFTH GRADE**

### **BIOSPHERE**

SUPPLIES: FOSS kit

TEXTS/BOOKS: *3D View for Biosphere Teacher and Student workbooks*

VIDEO: United Streaming

### **ECOSYSTEMS**

Sharpe Reservation General Information

Leaf Peeping at Sharpe by Mrs. Blakeslee

Save the Grove by Mrs. Blakeslee National Geographic's "Explore the Fantastic Forest"

Tour a woodland forest, look for clues, and solve a nature puzzle Temperate Deciduous

Forest The Temperate Deciduous Forest biome has four seasons of winter, spring,

summer, and fall. The Great Plant Escape Help Detective Leplant unlock the great

mysteries of plant life. University of Illinois. Trees are Terrific Good introduction to trees

The Secret Life of Trees Learn about the root system of trees. Tree Identification We at

Hillview have planted over a hundred of 29 different species of trees and shrubs on our

school grounds. These native plants attract birds, butterflies and small mammals. See if

you can identify these trees

### **PHOTOSYNTHESIS**

Illuminating Photosynthesis - Nova Animation Photosynthesis - Thinkquest

Photosynthesis – Quiz

Photosynthesis greenhouse -Explore Learning Gizmo A

Photosynthesis Lab -Explore Learning Gizmo B

### **FOOD WEBS**

Food Chain and Webs -in Forests

BBC Food Chain - Classification Virtual Food Web -Select Games, Then Look for and

Build Your Own Food Web

Fun with Food Webs - Meadow, Arctic and Pond Chain Reaction –Food Webs/Chains

<http://www.beaconlearningcenter.com/WebLessons/MixedUpCells/default.htm>

<http://www.prometheanplanet.com/en/Resources/Item/30448/>

<http://www.realtrees4kids.org/sixeight/letseat.htm>

Oradell, River Dell and River Edge Public School Districts

Science Curriculum – K -5

Approved June 22, 2011

TECHNOLOGY: 3D View  
LITERATURE: Circle of Life Text

## **ATMOSPHERE**

TEXTS/BOOKS: *3D view text and video, Weather and Climate Discovery Works text*

VIDEO: United Streaming

### **WEBSITES**

Weather Eye Lessons and experiments on lightning, climate, floods, and current weather info for kids from grades 2-12.

What's Up With the Weather?: NOVA investigates the complex scientific, ethical, and political issues surrounding possible human-induced global warming caused by the burning of fossil fuels. Teachers will find program contents, ideas, printable and on line activities, etc.

ScienceSpot Chemistry, astronomy, and physics

Brainpop.com

Movies and quiz about topics on science, health, English and more!

Discovery Kids.com

History, technology, nature, exploration and science categories

WORLDBOOK ONLINE for OPS home use too! Worldbook Encyclopedia

### **TECHNOLOGY**

What Forces Affect Our Weather? Explore the forces behind the weather. Try your hand at tornado chasing or discover how wind chill works. Learn about the water cycle, weather forecasting, atmosphere, changing climate, and more.

USA Today Weather Temperatures, forecasts, and weather-related stories from around the US.

Reading Weather Maps Examine features to look for on weather maps to make forecasts such as surface and area observations and temperature, learn general methods of preparing a forecast, and more specific tips for specific scenarios. Franklin Institute Franklin Institute site on various weather topics; one is how to make forecasting instruments using everyday materials; links to weather sites; explanation of El Nino; needs further study

Exploring the environment: Weather or Not

Learner Weather related links

AccuWeather

The Weather Channel.

## **CHEMISTRY**

TEXTS/BOOKS: *The Nature of Matter Discovery Works text*

VIDEO: United Streaming, Brain Pop

### **WEBSITES:**

<http://www.chem4kids.com/>

[http://www.harcourtschool.com/activity/states\\_of\\_matter/molecules.swf](http://www.harcourtschool.com/activity/states_of_matter/molecules.swf)

<http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&ResourceID=17>

<http://www.brainpop.com/>

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<http://www.inquiryinaction.org/>

National Science Digital Library, Science Digital Literacy Maps The Physical Setting: [Conservation of Matter](#)

<http://strandmaps.nsdl.org/?id=SMS-MAP-1332>

National Science Digital Library, [Science Refreshers](#)

<http://nsdl.org/refreshers/science/>

Science Curriculum Topic Study:

Density p. 164

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National Science Digital Library, Science Digital Literacy Maps The Physical Setting: [Conservation of Matter](#)

<http://strandmaps.nsdl.org/?id=SMS-MAP-1332>

The Physical Setting: [Chemical Reactions](#) <http://strandmaps.nsdl.org/?id=SMS-MAP-1349>

National Science Digital Library, [Science Refreshers](#)

<http://nsdl.org/refreshers/science/>

Science Curriculum Topic Study:

Chemical Properties and Change p. 161

## **ASTRONOMY**

TEXTS/BOOKS: *3D view text and video* , *Solar System and Beyond textbook (purple book)*

VIDEO: United Streaming

WEBSITES:

[http://wsanford.com/~wsanford/exo/gr4\\_astro\\_bingo\\_vocab.htm](http://wsanford.com/~wsanford/exo/gr4_astro_bingo_vocab.htm)

[http://www4.gcsd.k12.sc.us/education/components/scrapbook/default.php?sectiondetailid=27552&sc\\_id=1167319943](http://www4.gcsd.k12.sc.us/education/components/scrapbook/default.php?sectiondetailid=27552&sc_id=1167319943)

[http://www.google.com/Top/Kids\\_and\\_Teens/School\\_Time/Science/Astronomy\\_and\\_Space/Solar\\_System/](http://www.google.com/Top/Kids_and_Teens/School_Time/Science/Astronomy_and_Space/Solar_System/)

<http://starchild.gsfc.nasa.gov/docs/StarChild/StarChild.html>

A Learning Center for Young Astronomers; Text can be read for the student;

<http://www.enchantedlearning.com/subjects/astronomy/planets/>

Information on the planets and the universe. Activities are included.

[http://www.windows.ucar.edu/tour/link=/our\\_solar\\_system/solar\\_system.html](http://www.windows.ucar.edu/tour/link=/our_solar_system/solar_system.html)

Windows To The Universe: Visit links to the Sun, and visit the planets and other small bodies in the Solar System. Find out about solar system formation, and facts about the bodies in the solar system. See news highlights, and archives of images of the Sun, planets, comets, and asteroids.

<http://www.astronomy.com/asy/default.aspx?c=a&id=1091>

Find out what it's like on other planets. Learn how far away the stars are. Try a fun, space-themed project.

<http://library.thinkquest.org/CR0210901/>

Kids Exploring Space

<http://library.thinkquest.org/25401/data/main/index.html>

An interactive tour into our unique neighborhood above the heavens

<http://www.solarsystem.org.uk/data.html?PHPSESSID=024c2fd298a653146397d7cf8588ad8a>

A virtual solar system.

<http://library.thinkquest.org/25763/lindex.htm>

Solar system facts and movies.

<http://seds.lpl.arizona.edu/nineplanets/nineplanets/nineplanets.html>

Multimedia tour of the planets.

<http://library.thinkquest.org/18188/english/>

Advanced database of the solar system has information about our planets, the universe, and space exploration, as well as pictures and updated news.

<http://pds.jpl.nasa.gov/planets/>

This is a collection of many of the best images from NASA's planetary exploration program.

[http://www.cdli.ca/CITE/solar\\_system.htm](http://www.cdli.ca/CITE/solar_system.htm)

Great site for teachers to use in lessons.

<http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&ResourceID=441>

Step through the solar system, observing the length of a year and the orbital path of each object. The positions of the eight official planets are displayed, as well as one dwarf planet, Pluto. Learn about Kepler's Laws, when planets will align, and why space probes are often launched at certain times.

<http://www.fourmilab.ch/cgi-bin/uncgi/Solar/action?sys=-Si>

A solar system live update that shows where the planets are in real time.

<http://starchild.gsfc.nasa.gov/docs/StarChild/StarChild.html>

Comparing planet size and your weight on other planets. Activities included.