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1. Strand: Concepts and Processes (NSES, IL 12)

A. Standard: Systems, Order, and Organization

The student will know:	The student will be able to:	Suggested Activities	Suggested Resources
1. Objects can be grouped into catagories.	1. Group objects according to various criteria.	1. Use pictures or objects and divide them into groups using various criteria such as shape, color, size, texture, etc.	
2. There are living and non-living things.	2. Identify living and non-living things.	2. Group pictures or objects into living and non-living things or make a class chart of living and non-living things.	
3. Living things are either plant or animal.	3. Identify things as plant or animal.	3. Use pictures to identify things as plant or animal.	

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C. Standard: Change, Constancy, and Measurement

The student will know:	The student will be able to:	Suggested Activities	Suggested Resources
1. Changes and constancy can be measured using proper tools or observation.	1. Use tools to measure change (e.g., thermometer, ruler, magnifiers).	1a. Keep a calendar to chart weather and temperatures. 1b. Measure and record changes of seeds and plants.	
2. Data from inquiry can be organized to evaluate results.	2. Make and use charts, graphs, and journals to evaluate the results of data.	2a. Graph the temperature. 2b. Keep a journal of seed or plant changes.	

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2. Strand: Science as Inquiry (NSES, IL 11, MO 7)

A. Standard: Abilities Necessary to Do Scientific Inquiry

The student will know:	The student will be able to:	Suggested Activities	Suggested Resources
1. Using simple tools, following directions, or asking for suggestions are helpful in building something or getting something to work better.	1. Use simple tools and follow directions to describe an object or event or solve a problem.	1. Use simple tools, follow directions, or ask for help to build a maze that a pingpong ball can be successfully blown through.	
2. Words, pictures, number models, and sounds can be used to describe objects and events.	2. Create communications that describe and compare things in terms of number, shape, texture, size, odor, sound, mass, color, and motion.	2. Look at a group of objects such as vegetables, leaves, rocks, etc. and describe to another person a single item so that the person can pick it out from the group.	

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B. Standard: Understandings About Scientific Inquiry

The student will know:	The student will be able to:	Suggested Activities	Suggested Resources
1. The processes of scientific inquiry are important for engaging in science and applying scientific methods.	1a. Describe an observed event. 1b. Develop questions on scientific topics. 1c. Collect data for investigations using measuring instruments and technology. 1d. Record and store data using available technologies. 1e. Arrange data into logical patterns and describe the patterns. 1f. Compare observations of individual and group results.	1. Use the process of scientific inquiry while performing an experiment; collect and record data; compare and evaluate the results.	

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3. Strand: Physical Science (NSES, IL 12, MO 1, 2)

A. Standard: Properties of Objects and Materials

The student will know:	The student will be able to:	Suggested Activities	Suggested Resources
1. Objects can be described by properties such as size, shape, texture, and color.	1. Organize objects by size, shape, texture, or color.		
2. Matter can be classified as solids, liquids, and gases.	2. Identify solids, liquids, and gases by their properties.	2. Generate a class list of solids, liquids, and gases.	*What is the World Made Of? All About Solids, Liquids, and Gases* by Kathleen Weidner Zoelfeld, Harper Collins Publishers, 1998
3. Physical properties can change.	3. Identify and observe changes in physical matter.	3a. Show how water changes to ice and to steam. 3b. Make magic muck. 3c. Make an alka bomb.	*Merry Poppin's* by Bernice Meyers and Bill Schmidt Presented at LEA 2002
4. Heat causes materials to increase in temperature and feel warmer or change state.	4. Select and apply strategies to show how heat causes materials to increase in temperature and feel warmer.	4. Use a light bulb or sunlight and a thermometer to compare how heat flows through different materials (aluminum, air, colored paper, cloth).	

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5. Mixtures are made of different kinds of matter, each with distinct properties.	5. Separate, sort, or group the components of a mixture by their properties.	5a. Dissolve salt in water and let the water evaporate to show that the salt is still there. 5b. Prepare a trail mix or tossed salad. Separate the components of the mixture.	

B. Standard: Position and Motion of Objects

The student will know:	**The student will be able to:**	**Suggested Activities**	**Suggested Resources**
1. Objects can be moved by pushing and pulling.	1. Identify pushing and pulling as ways to move objects.	1. Have students push and pull a variety of objects. Students describe the bahavior as pushing or pulling	
2. Movement of objects can change direction and speed.	2. Understand that pushes and pulls can change the direction and speed of an object.		
3. Simple machines make work easier.	3. Identify simple machines: lever, wheel, ramp, and pulley.	3a. Use a ruler to create a lever. 3b. Move a heavy box with and without wheels.	

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C. Standard: Light, Heat, Electricity, and Magnetism

The student will know:	The student will be able to:	Suggested Activities	Suggested Resources
1. A shadow is made when something blocks light.	1. Tell how a shadow is made.	1. Using a projected light, students obseve their shadows. Teacher draws profile of student's shadow.	
2. Shadows cast by the sun change.	2. Learn that the position and shape of a shadow made by the sun can change.	2. Trace a shadow made by the sun at different times of the day.	
3. Heat comes from different sources.	3. Identify sources of heat.	3. Brainstorm with students sources of heat.	
4. Some materials conduct heat better than others.	4. Observe that heat moves more easily through some materials than others.	4. Use different materials to insulate an ice cube and record which cube lasts the longest.	
5. Objects that give off light may also give off heat.	5. Identify a variety of light sources and determine which give off heat.	5. Compare the heat from several light sources (sun, halogen bulb, incandescent bulb).	
6. Magnets attract certain metal objects.	6. Identify materials that are attracted to a magnet.	6. Create a center containing magnets and objects that may or not be attracted to them.	
7. Magnets attract and repel other magnets.	7. Observe the effect of one magnet on another.	7. Provide opportunities for students to experiment with the polarity of magnets.	

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4. Strand: Life Science (NSES, IL 12, MO 3, 4)

A. Standard: Characteristics of Organisms

The student will know:	The student will be able to:	Suggested Activities	Suggested Resources
1. Plants and animals are living things.	1. Identify living things in the world around them.	1. List living things in the classroom, on the playground, at home, etc.	
2. What plants and animals need to grow.	2. Identify what plants and animals need in order to grow.	2. Experiment by growing plants in various environments.	
3. The parts of a plant.	3. Identify roots, stems, leaves, flowers, fruit, and tell their jobs.	3a. Put celery in colored water to observe the work of the stem. 3b. Plant seeds and observe their growth.	*How Do Apples Grow? b*y Betty Maestro, Scholastic, 2000 *Primarily Plants* 1990 AIMS Education Foundation Grades K-3 *The Mailbox*, Primary, April/May 2001 *The Mailbox,* Kindergarten, April/May 2002
4. There are different kinds of animals.	4. Animals can be grouped by how they move and the body coverings and body parts they have.	4a. Using pictures, divide animals into groups according to how they move and the body coverings they have. 4b. Discuss the three body parts of an insect and make an insect out of clay.	

Grade level: First Grade

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B. Standard: Life Cycles and Organisms

The student will know:	The student will be able to:	Suggested Activities	Suggested Resources
1. Organisms go through life cycles.	1a. Observe and record the phases of the life cycles of various organisms. 1b. Describe ways plants, animals, and people change as they grow.	1a. Hatch chicken eggs, watch tadpoles develop, observe butterfly life cycle. 1b. Discuss the human life cycle.	*Chicken's Aren't the Only Ones*, Ruth Heller, Scholastic 1981; www.earth'sbirthday.org University of MO Extension Jefferson County 4-H Program, University Extension Center, P.O.Box 497, Hillsboro, MO 63050 University Extension, University of MO System Lincoln University, Meramec Tower 1215 Meramec, Suite 501, Clayton, MO 63105 *Science Project Guide*, University Extension and MO Department of Education and Secondary Education, 1995 *Early Themes Life Cycles,* Scholastic Professional Books, 1998 http://www.urbanext.uiuc.edu/eggs/lessonplan08.htmt Pondmarket fieldtrip to get free tadpoles. 500 South County Center Way 314-894-2894

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			Butterflies: Now I Know Look...a Butterfly by David Cutts, Troll Assiciates, 1982 *Amazing World of Butterflies and Moths* by Louis Sabin, Troll Associates, 1982 *Where Do Butterflies Go When It Rains?* by May Garelick, Scott Foresman Company. *A Place For Butterflies* by Melissa Stewart, Scholastic, 2007
2. Plants develop from seeds.	2. Describe how a seed grows into a plant.	2. Grow a lima bean in a bag and chart the growth from seed to plant.	*I'm a Seed* by Jean Marzollo, Scholastic, 1996 *Seeds! Seeds! Seeds!* by Nancy Elizabeth Wallace, Scholastic, 2005 *The True Book of Plants We Know* by O. Irne Sevrey Miner, Children's Press, 1953
3. Most offspring are similar but not exactly like their parents.	3. Identify and discuss the similarities and differences between parents and their offspring.	3. Look at pictures or make drawings of parents and offspring and draw conclusions about inherited traits.	*Baby Animals a Change-a-picture-book,* 1979 Intervisual Communication, Inc.

Grade level: First Grade

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C. Standard: Organisms and Environments

The student will know:	The student will be able to:	Suggested Activities	Suggested Resources
1. All organisms depend on one another and their environment to live and grow.	1. Identify the basic needs of organisms and how they depend on their environment to live and grow.	1a. Create a habitat for an animal. 1b. Observe animals in their habitats (zoo fieldtrip). 1c. Discuss how various seeds disperse and grow. 1d. Design a fictitious animal or plant with the physical characteristics that will let it live and grow in a particular environment. 1e. Make a shoebox habitat for an animal of your choice.	*Underground Homes* by Jeff Bauer, Scholastic, 2007 *Coral Reef Homes* by Jeff Bauer, Scholastic, 2007 *Rain Forest Homes* by Lydia Carlin, Scholastic, 2007 *Tree Homes* by Carol Ghiglieri, Scholastic, 2007 *Desert Homes* by Justin McCory Martin, Scholastic. 2007 *Cave Homes* by Elizabeth Bennett, Scholastic, 2007
2. All organisms, including humans, cause changes in their environments that can be either beneficial or harmful to the organisms in the ecosystem.	2. Describe the care that need to be given to ensure that plants and animals will continue to have the habitats they need to survive.	2. Make a chart listing the basic needs of plants and animals. In two other columns, list examples of what could go wrong with this element and what could be done to make it right. E.g., water birds and oil spills, rainforests, air and water pollution.	*The Last Forest* by Laurie Glick, Young Readers Press, 1973 *Charlie Was Just a Chipmunk*, MO Dept. of Conservation *A World Fit For Chipmunks and Other Things*, MO Dept. of Conservation

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3. Food and other useful products come from plants and animals.	3a. Identify foods and other items that come from plants. 3b. Recognize that people need animals for food, clothing, work, and companionship.	3. Generate a class list of how we use plants and animal products.

Grade level: First Grade

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5. Strand: Earth and Space Science (NSES, IL 12, MO 5, 6)

A. Standard: Properties of Earth Materials

The student will know:	The student will be able to:	Suggested Activities	Suggested Resources
1. The Earth has air, land, and water.	1. Identify land and water on a globe and recognize that air is everywhere.	1. Using a globe, find the continents and large bodies of water.	
2. The Earth is made of many different rocks and minerals.	2a. Recognize that rocks come in many different sizes, colors, and shapes. 2b. Recognize weathering can change rocks. 2c. Recognize that soil is made of rocks and other things. 2d. There are different types of soils.	2a. Examine a rock and mineral collection with magnifiers. 2b. Experiment with shaking chalk in a container to show weathering. 2c. Observe different types of soil.	*Let's Go Collecting* by Roma Gans, Harper Collins Publishers, 1984

B. Standard: Objects in the Sky

The student will know:	The student will be able to:	Suggested Activities	Suggested Resources
1. The sun, moon, and stars are in the sky.	1. Identify the sun, moon, and stars.	1. Draw a picture of the sky at night and in the day.	
2. The turning of the Earth results in day and night.	2. Demonstrate that the Earth has day and night as a result of the earth turning.	2. Demonstrate day and night by using a ball and flashlight.	

3. All living things need the sun.	3. Understand that heat and light from the sun are necessary for life on the Earth.	3. Grow plants in different locations in the room (window, file drawer, cold area).
4. The moon changes in size and shape.	4a. Identify changes in the moon. 4b. The moon causes tides.	4. Draw the phases of the moon.

C. Standard: Changes is Earth and Sky

The student will know:	**The student will be able to:**	**Suggested Activities**	**Suggested Resources**
1. Weather can vary.	1a. Identify different types of weather and keep a record of the weather. 1b. Measure temperature with thermometers.	1. Keep a weather calendar and record the weather and temperature each day.	*Lightning!* by Lorraine Jean Hopping, Scholastic, 1999 *Wind* by Marion Dane Bauer *Snow* by Marion Dane Bauer *Rain* by Marion Dane Bauer, Scholastic, 2005 *Early Themes Grades K-1 Weather* by Ann Flagg, Professional Books, 1997
2. Changes in weather and seasons affect plants, animals, and people.	2a. Tell how people dress for different types of weather. 2b.Know that most plants sleep in the winter. 2c. Know that some animals hibernate or migrate during cold weather.	2a. Draw pictures of how people dress for different seasons. 2b. Observe changes in the trees and plants around the school and draw the changes over a year. 2c. Tell what animals do in winter.	*When Autumn Comes* by Robert Maass, Scholastic, 1996 *It's Fall* by Linda Glaser, Scholastic, 2005

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3. Clouds form when water vapor cools.	3. Demonstrate how a cloud is formed.	3. Rinse a jar in warm water. Put a little warm water in the jar. Place the lid upside down on top of the jar. Put ice cubes on the lid. Observe what happens inside the jar.	*Clouds* by Marion Dane Bauer, Scholastic, 2005
4. Some natural resources are limited and need to be used wisely and preserved.	4. Tell how natural resources, though limited, can be extended through wise use and recycling.	4a. Make a worm bin. 4b. Start a compost bin. Observe ways your school recycles (paper, aluminum, used clothing, etc.).	*Be a Friend to a Tree* by Patricia Lauber, Scholastic, 2002 *A Gift of a Tree* by Greg Henry Quinn, Scholastic, 1994 *Recycle Every Day* by Nancy Elizabeth Wallace, Scholastic *Wiggling Worms at Work* by Wendy Pfeffer, Scholastic, 2005 Jefferson County Solid Waste Management Recycling Coordinator, worm bin--Environmental Education Programs Educational Activities Book--*Reduce, Reuse, Recycle, Jefferson County Recycles*, Jefferson County Solid Waste Management Division, P.O. Box 100, Hillsboro, MO 63050 e-mail: kdunnam@jeffcomo.org

Grade level: First Grade

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6. Strand: Science and Technology (NSES, IL 13, MO 8)

A. Standard: Abilities of Technological Design

The student will know:	The student will be able to:	Suggested Activities	Suggested Resources
1. The application of concepts, principles, and processes of technological design are useful in problem solving.	1a. Given a simple design problem, formulate possible solutions. 1b. Design a device that will be useful in solving the problem. 1c. Build the device using the materials and tools provided. Test the device and record results using given instruments, techniques, and measurement tools. 1d. Communicate findings accurately using oral, written, and pictorial presentations, and using evidence to support conclusions.	1. Students work in small groups to design a paper boat that will hold ten pennies and float across a pan of water.	

Grade level: First Grade

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B. Standard: Understands About Science and Technology

The student will know:	The student will be able to:	Suggested Activities	Suggested Resources
1. Science has an effect on the daily lives of people.	1. Identify and describe ways that science and technology affect people's everyday lives (e.g., transportation, medicine, agriculture, sanitation, communication occupations).	1a. Discuss with students how science affects their daily lives. 1b. Students draw a picture and write about one way science affects their daily life.	

C. Standard: Abilities to Distinguish Between Natural Objects and Objects Made by Humans

The student will know:	The student will be able to:	Suggested Activities	Suggested Resources
1. All things are God-made or man-made.	1. Identify things created by God and things made by man.	1. Make a class list of things created by God and things made by man.	
2. All things can be classified as living, non-living, or once-living.	2. Sort items according to the catagories of living, non-living, and once-living.	2. Collect items during a nature walk around the school yard. Sort the items and group them according to living, non-living, and once-living. Discuss the students' choices.	

Grade level: First Grade

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7. Strand: Science in Personal and Social Perspectives (NSES, IL 12, MO 8)

A. Standard: Personal Health

The student will know:	The student will be able to:	Suggested Activities	Suggested Resources
1. Using all senses helps us observe the world.	1a. Name the five senses and how they can be used. 1b. Use the sense of hearing to identify sounds. 1c. Use the sense of smell to observe and identify different scents. 1d. Describe what can be observed in a given situation.	1a. Shake boxes with small objects and have students try to identify what is in the each box. 1b. Soak cotton balls in various flavorings and have students try to identify the smell. 1c. Play "I Spy".	*Sense-able Science*, AIMS Education Foundation, 1994 *Thematic Unit: Five Senses*, Teacher Created Materials, Inc., 1990 Set of Five senses books My Melvin and Gilda Berger, Scholastic, 2003: *Your Five Senses, You Smell With Your Nose, You Touch With Your Fingers, You Taste With Your Tongue, You Hear With Your Ears, You See With Your Eyes*

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2. Your body is made up of many different parts.	2a. Identify bones as the support your body. 2b. Identify that muscles are responsible for making your bones move your body. 2c. Understand that your heart is a muscle. 2d. Identify skin as protection for what is on the inside of your body. 2e. Understand that God made each of us different.	2a. Read books on the body, bones, muscles, heart, skin that tell the function of each. 2b. Play nutrition dominoes.	*Me and My Amazing Body* by Joan Sweeney, Scholastic, 2000 Set of body books by Melvin and Gilda Berger, Scholastic, 2005: *Your Bones, Your Muscles, Your Heart, Your Skin, Your Brain, Your Body*
3. Good health practices help us take care of the bodies God gave us.	3a. Tell that washing hands washes away germs and keeps us healthy. 3b. Tell that good nutrition helps keep us healthy. 3c. Tell that exercise and sleep help keep you healthy. 3d. Tell how to take care of their teeth.	3a. Learn about the food pyramid and identify foods in each group. 3b. Have a fruit and vegetable tasting party. 3c. Chart the foods you eat each day for a week by food groups. 3d. Keep a record of how much sleep you get. 3e. Begin an exercise period in your class before you begin your day. 3f. Study about good dental health practices and chart what students do at home.	LESA Health Curriculum Guide www.mypyramid.gov American Heart Association *Food Time*, Scholastic, 1995 *Sleep Is For Everyone* by Paul Showers, 1972 *Hooray for Teeth* by Gina Shaw, Scholastic, 2001 *I Know Why I Brush My Teeth* by Kate Rowan, Scholastic, 2000 First Grade Dental Health Program, www.pgschoolprograms.com Tooth Fairy Booklet, *The Mailbox,* Prek-K, Feb./Mar. 1993

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8. Strand: History and Nature of Science (NSES, IL 13)

A. Standard: Science as a Human Endeavor

The student will know:	The student will be able to:	Suggested Activities	Suggested Resources
1. All people are scientists as they investigate the world and develop new processes and ideas.	1. Affirm that everyone can think like a scientist, invent things, and have scientific ideas.	1. Discuss ways we can think scientifically and encourage everyone to investigate and challenge existing ideas and pursue new ideas.	
2. Men and women from many backgrounds and countries have made contributions in the area of science.	2. Describe contributions men and women have had to science and technology (e.g., George Washington Carver, Edward Jenner, Benjamin Franklin, Thomas Edison, Louis Pasteur, Rachel Carson).	2. Read biographies about persons who have made important contributions to science.	