DOCUMENT RESUME

ED 469 087 SE 066 833

TITLE	Fifth Grade Level Science Sample Curriculum.
INSTITUTION	Arkansas State Dept. of Education, Little Rock.
PUB DATE	2002-00-00
NOTE	21p.; For science sample curricula for grades K-8, see SE 066 828-836.
AVAILABLE FROM	For full text: http://arkedu.state.ar.us/curriculum/benchmarks.html.
PUB TYPE	Guides - Non-Classroom (055) -- Legal/Legislative/Regulatory Materials (090)
EDRS PRICE	EDRS Price MF01/PC01 Plus Postage.
DESCRIPTORS	*Academic Standards; Earth Science; *Grade 5; Inquiry; Intermediate Grades; Physical Sciences; Problem Solving; *Science Curriculum; *Science Instruction; State Curriculum Guides; *State Standards
IDENTIFIERS	Arkansas

ABSTRACT

This document presents a sample of the Arkansas science curriculum and identifies the content standards for physical science systems, life science systems, and Earth science/space science systems for fifth grade students. Each content standard is explained and includes student learning expectations, fifth grade benchmarks, assessments, and strategies and activities. (YDS)

Fifth Grade Level Science Sample Curriculum

1

Fifth Grade Level Science

STRAND 1: PHYSICAL SYSTEMS CONTENT STANDARD 1 Students will demonstrate an understanding of physical systems as a process of inquiry.			
Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
PS.1.1. Understand that the laws of science are universal.	Students understand that physical phenomena behave the same everywhere on Earth.	Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Divide the class into two groups to perform the same experiment and share the results. Discuss what would/could cause variances in the results.
PS.1.2. Understand that a scientific theory is based on current, accepted evidence and is used to make predictions.	Students understand that scientific theories provide explanations of how the world works. Students understand that scientists look at the natural world and develop a hypothesis about how something works and then test the hypothesis many times.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Students discuss how models fit into scientific theories. Have students discuss historical and contemporary examples of how scientists have developed a hypothesis and tested it.
PS.1.3. Generate written conclusions based on evidence acquired through experimentation.	Students conduct experiments and write lab reports.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	From one of the experiments done in class, students will reach a conclusion based on group discussion.
PS.1.4. Interpret scientific information from graphs and charts.	Students interpret graphs and charts.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students working in groups or individually interpret graphs and charts supplied by the teacher.

STRAND 1: PHYSICAL SYSTEMS CONTENT STANDARD 2 Students will explore, demonstrate, communicate, apply, and evaluate the knowledge of physical systems.			
Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
PS.2.1. Demonstrate an understanding of the *states of matter* and describe the various combinations of matter (*mixtures* and *compounds*).	Students can name and compare the states of matter (solid, liquid, and gas).	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Log/Journal Essay Writing	Have students name and compare examples of the states of matter.
PS.2.2. Identify and describe the properties of an atom.	Students should be able to name and identify characteristics of electrons, protons, and neutrons.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students make models of atoms using a key to denote the parts or name. Have students identify electrons, protons, and neutrons from pictures or teacher made materials.
PS.2.3. Investigate the *periodic chart.*	Students can name and write the symbol for several common elements.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students research several common elements and symbols. Have students create a Chemical Bingo using symbols and the teacher calls out the names of the elements. Discuss where elements got their symbols. (Sodium comes from Latin for natrium).
PS.2.4. Experiment and identify *physical* and *chemical changes.*	Students can identify common examples of physical and chemical changes.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Select 15 – 20 examples of changes (tearing paper, burning paper, mixing sand and salt, melting butter, etc) and have students identify whether each is a chemical or physical change.

Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
PS.2.5. Examine the sources and analyze the preservation of energy resources.	Students research print and nonprint resources and write about energy resources and ways to preserve limited energy resources.	Statewide Test Teacher-made Test Teacher Observation Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students use the library and the Internet to prepare a paper about energy resources and their preservation.
PS.2.6. Experiment with *forces* (*gravity*, *magnetism*, and *electricity*).	Students can perform experiments dealing with the force of gravity (free-fall, down a ramp, or stairs). Students know that objects do not change direction unless acted upon by an outside force.	Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students drop balls of varying sizes and masses in free-fall and then down stairs and a ramp. Have them describe how gravity affects each ball. Discuss how each ball's bouncing and rolling relates to an outside force acting on an object.
PS.2.7. Investigate the laws of motion.	Students understand how inertia, gravity, friction, mass, and force affect motion.	Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Roll two matchbox cars of different sizes and mass down a gradual slope on a hill. Explain how inertia, gravity, friction, mass, and force affect motion.
PS.2.8. Demonstrate and communicate the relationship between magnetic fields and electric currents.	Students can experiment with a compass near electrical appliances.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Pass a magnetic compass near an electrical appliance (telephone, computer, electric motor, etc.) and record the results.
PS.2.9. Introduce the *electromagnetic spectrum* (radio, infrared, visible light, and ultraviolet *waves*, x-rays).	Students experiment with the spectrum of light passing through a prism. Students describe the results of light passing through lenses of different shapes.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students use prisms to experiment with light and color. Have them draw and label the results of their experiment in color. Discuss what happened with the experiment. Have students draw models of their results of the experimenting with different lenses. Have them use Venn diagrams to compare and contrast their results.

Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
PS.2.10. Investigate and identify conductors and insulators of heat and electricity.	Students can name objects that are conductors of heat and objects that are insulators of heat.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students experiment with various materials to determine the conductors of heat and insulators of heat.
PS.2.11. Distinguish energy transfer (*conduction, convection, and radiation*).	Students demonstrate an understanding of conduction of heat.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students identify conduction of heat from teacher examples and name other examples from their experiences.
PS.2.12. Investigate sound *waves* and gamma rays.	Students can explain how sound waves travel through water.	Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Strike a tuning fork and touch the handle to the side of a beaker of water. Repeat this but touch the vibrating end to the water. Have students describe what happens and draw conclusions.

STRAND 1: PHYSICAL SYSTEMS CONTENT STANDARD 3 Students will demonstrate an understanding of the connections and applications of physical science.			
Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
PS.3.1. Design and conduct different kinds of scientific investigations to answer different kinds of questions.	Students design and conduct experiments.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students design and conduct an experiment to determine how much paper a school uses in a month.
PS.3.2. Demonstrate how physical science is connected to mathematics (analyze collected data).	Students are aware of the mathematical need to collect more than one set of data in conducting experiments.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Collect one set of data and compare that to the average of several sets of data from an experiment.
PS.3.3. Apply multiple strategies to problem solving.	Students research the library and the Internet to find several answers to solve a problem and then determine the most scientifically sound solution.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have teams of students gather information on a problem and defend a solution.
PS.3.4. Use appropriate equipment, tools, techniques, technology, mathematics, and technical writing in scientific investigation.	Students are aware of and practice safety rules and can identify these rules on exams. Students can use glassware, batteries, electrical connections, magnifiers, magnets, light bulbs, chemicals, Genecons, compasses, etc. as part of physical science experiments and can write about their investigations.	Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students identify teacher-made science safety rules. Students are trained in how to properly use scientific equipment and use it on a regular basis to conduct experiments in their classrooms.

Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
PS.3.5. Investigate a variety of careers related to physical science.	Students can identify knowledge an astronaut would need for his/her job.	Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Identify skills and knowledge that an astronaut would need.
PS.3.6. Acknowledge the impact of scientific discoveries upon society.	Students discuss the impact of scientific discoveries on their lives.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Set up pro and con teams to discuss the selected scientific discovery.
PS.3.7. Recognize that scientific discovery has been influenced by historical events.	Students can identify historical events surrounding the development of communication systems.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students use print and nonprint resources to research a historical event and its impact on society.

STRAND 2: LIFE SCIENCE SYSTEMS CONTENT STANDARD 1 Students will demonstrate an understanding of life science as a process of inquiry.			
Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
LS.1.1. Recognize that science deals only with inquiry about the natural world.	Students understand the domain of science in the natural world. Students can name questions that science cannot answer.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students discuss science's purpose (to answer questions about the natural world). Discuss those questions science cannot answer (e.g., the meaning of good and evil, supernatural events , a definition of beauty).

Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
LS.1.2. Interpret scientific information from graphs and charts.	Students interpret graphs and charts.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students interpret teacher-assigned graphs and charts to obtain information.
LS.1.3. Conduct investigative science through use of the *scientific method*	Students can set-up experiments or observations based on the scientific method.	Statewide Test Teacher-made Test Teacher Observation Portfolio performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students set up an experiment or observation and have teacher evaluate the effectiveness of the study.
LS.1.4. Generate conclusions based on evidence acquired through experimentation.	Students form conclusions based on experimental results.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students evaluate (perhaps using a rubric) their own and each other's conclusions.

STRAND 2: LIFE SCIENCE SYSTEMS CONTENT STANDARD 2 Students will explore, demonstrate, communicate, apply and evaluate the knowledge of life systems.			
Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
LS.2.1. Identify, describe, and explain various types of cells and cell processes.	Students can identify and name the functions of the parts of plant or animal cells.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students design, construct, and label models of plant and animal cells. Compare and contrast drawings of a plant and animal cell. What are the obvious differences? What are other differences?
LS.2.2. Describe similarities and differences between single celled and multicellular *organisms*.	Students can recognize single-celled organisms under a microscope.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Use a microprojector or video camera to view a variety of single-celled organisms. Have students make and label drawings of what they view.
LS.2.3. Arrange *organisms* into groups according to similarities and differences.	Students can identify vertebrates and invertebrates (chordates and non-chordates).	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students identify and explain examples of vertebrates and invertebrates (chordates and non-chordates).
LS.2.4. Identify the requirements for living *organisms*.	Students can identify air, water, food, space, and shelter as important to living things.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students develop a mobile with examples of living things at the top and strings hanging down that explain what things need to live. Have students write about the importance of these items in their journals.

Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
LS.2.5. Explain life cycles of various *organisms*.	Students can explain the life cycle of plants and animals.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students explain in writing or by illustration the life cycle of a bean plant, butterfly, and a frog Raise plants and animals in the classroom and have students write about the experience.
LS.2.6. Describe the parts of the human body systems and determine their function.	Students can locate human body organs in pictures or models. Students can name the function of the brain, heart, kidneys, lungs, bones, and skin.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students place designated plaster organs in the proper places in a plastic human body. Have them create labels that describe the function of each organ.
LS.2.7. Describe how heredity and environment influence/determine characteristics of an *organism*.	Students know that offspring inherit traits from their parents. Students know that these traits reside in the nucleus of cells.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students compare several sets of dog or cat parents' pictures with pictures of their offspring. Use a model of a cell to discuss DNA and where inherited traits reside in a cell.
LS.2.8. Recognize that reproduction *is* a characteristic of all living *organisms* and is essential to the continuation of life.	Students can describe the fertilization and seed development in common plants.	Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students fertilize and grow fast-growing plants (mustard) and chart the charges.

LS.2.9. Explain how physical and/or behavioral characteristi cs of *organisms* help them to adapt and survive in their environments	Students can describe what physical and behavioral characteristics animals have that allow them to survive seasonal changes.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Describe the physical and behavioral characteristics of bears, wolves, snakes, frogs, and birds that help them survive seasonal changes.
LS.2.10. Describe how genetic material changes through time producing new species while some older species die out and become extinct.	Students understand that the Earth is quite old and that life began about 3.5 billion years ago and has changed over time (evolved). Students understand that there have been organisms (fern trees, dinosaurs, mammoths, etc.) that no longer exist today.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students create a geological timeline that shows time before life and the appearance of life forms. Have students use print and nonprint resources to research organisms that no longer exist. Discuss events that may have caused their extinction. Discuss why dinosaurs and humans did not exist on Earth at the same time.
LS.2.11. Analyze ecosystems in terms of population relationships, *food webs*, energy flow, and *biotic succession.*	Students can identify food webs, energy flow, and succession in an environment.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Set up an aquarium and for students to observe over time. Have students identify and write about the food webs, energy flow, and succession within the aquarium.
LS.2.12. Evaluate human impact on the environment.	Students can evaluate the impact of their community activity on the environment.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students evaluate the impact of a community's activities on the environment (e.g.., wastewater, pollution, use of chemicals, etc.).

STRAND 2: LIFE SCIENCE SYSTEMS CONTENT STANDARD 3 Students will demonstrate an understanding of the connections and applications in life sciences			
Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
LS.3.1. Design and conduct life science investigations to answer different kinds of questions.	Students design an investigation to solve a problem at their school.	Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students identify a problem and design an investigation to solve the problem.
LS.3.2. Correlate life science activities to other curricular areas (e.g., language arts, mathematics, social studies).	Students can name when art, music, math, language arts, health and physical education skills are important to science activities.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students brainstorm, identify, discuss, and use skills learned in art, music, math, language arts, health and physical education in science activities.
LS.3.3. Apply multiple strategies to problem solving.	Students can research various print and nonprint resources to find solutions for scientific problems.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have teams of students select a science problem to be solved and research the library and the Internet to find several solutions to a problem and then discuss to determine which is the most scientifically sound solution.
LS.3.4. Use appropriate equipment, tools, techniques, technology, mathematics, and technical writing in scientific investigation.	Students are aware of safety rules and can identify these rules on exams.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Test students on science class safety rules.

Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
LS.3.5. Investigate a variety of careers related to life sciences.	Students can identify life science knowledge in careers found in the local community.	Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students select a career found in their community and then identify the kinds of scientific knowledge needed for that career.

STRAND 3: EARTH/SPACE SYSTEMS CONTENT STANDARD 1 Students will demonstrate an understanding of the inquiry process through the study of earth and space systems.			
Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
ES.1.1. Identify the components of Earth (rocks, water, and air) and their properties.	Students can identify the layers of the atmosphere.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Use models, dioramas, or diagrams to illustrate the layers of the atmosphere.
ES.1.2. Understand that Earth and objects in space constantly undergo changes and/or cycles, which can be observed and measured.	Students explain the evolution of stars and planets in general terms.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students use print and nonprint resources to research information on the theory about the expanding universe and discuss. Have students find the color and size of various stars.

Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
ES.1.3. Generate conclusions based on evidence acquired through experimentation.	Students draw conclusions from their experiments.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	After conducting an experiment, students draw conclusions and submit them in scientific form to the teacher.
ES.1.4. Interpret scientific information from graphs and charts.	Students interpret graphs and charts.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have teams of students read and interpret graphs and charts selected by the teacher.
ES.1.5. Identify and classify rocks and *minerals*.	Students can identify common sandstone, shale, and limestone rocks native to Arkansas. Students can identify some common minerals.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	The teacher selects common sandstone, shale, and limestone rocks and common minerals from Arkansas to use in a lab test for students. (These can be obtained from local sources or from the Arkansas Geology Commission).
ES.1.6. Understand the relationship between Earth and objects in space.	Students demonstrate an understanding of Earth's place in the solar system.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students construct and explain a model of the solar system.

STRAND 3: EARTH/SPACE SYSTEMS CONTENT STANDARD 2 Students will explore, demonstrate, communicate, apply and evaluate knowledge of the properties of earth and space systems.			
Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
ES.2.1. Investigate the formation and properties of rocks (*igneous, sedimentary*, and *metamorphic*), *minerals*, and *fossils*.	Students can describe the formation of igneous, metamorphic, and sedimentary rocks. Students can identify common Arkansas fossils.	Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students design a model or illustration to show formation of igneous, metamorphic, and sedimentary rocks. The teacher selects common Arkansas fossils to use in a lab test for students.
ES.2.2. Understand the relationship, which exists between rock formation, fossil evidence, and geological history and age of the Earth.	Students understand the Earth's age to be 4.5 billion + years old based on the age of the rocks based on radioactive dating. Students can describe how fossils are used to compare the layers and ages of the Earth.	Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students research radioactive dating of fossils and rock using print and nonprint resources. Discuss how the dating works and how reliable scientists find this method to be. Construct clay models of fossils and bury them in different layers on sand, dark soil and light soil. Have students research how fossils are used to compare the layers and ages of the Earth.
ES.2.3. Investigate how Earth's internal processes affect external features (volcanoes, earthquakes, mountain formation, etc.).	Students can identify layers of the Earth's core and their properties. Students can identify various landforms.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students locate the earthquake zones in Arkansas on a map. Have students construct models to show how mountains were formed in our state.
ES.2.4. Understand the effects of *weathering* and *erosion* on the Earth's surface.	Students can describe how soil is formed and how it erodes. Students can describe how wind, water, and ice erode rocks and soil.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Make soil by mixing sand, silt, clay, organic material and trace minerals. Then erode the soil with wind and water.

Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
ES.2.5. Describe and model the natural divisions of Arkansas.	Students can identify the geologic features and plant communities of the six natural divisions of Arkansas.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students design models or maps of the geologic features and plants communities in each the six natural divisions of Arkansas. (See resource list.)
ES.2.6. Describe the energy transfer within the *atmosphere* as it relates to the development of weather and climate patterns.	Students can describe how sun heats the atmosphere and produces our winds. Students can describe how the sun heats the atmosphere and drives the water cycle.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students design a demonstration of how heated water and/or air will move to produce currents. Have students relate what they learn in these demonstrations to the water cycle.
ES.2.7. Explain and illustrate the *water cycle.*	Students can identify the components in the water cycle (evaporation, condensation, and precipitation) from models or drawings.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students identify the components in the water cycle on a chart or illustration.
ES.2.8. Model and explain how the Earth's shape and tilt result in different seasons.	Students can describe how the tilt of the Earth produces our seasons.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Using models, have students describe how the tilt of the Earth produces our seasons.

Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
ES.2.9. Investigate the predictable motion of objects in space in explaining phenomena such as day, night, moon phases, ocean tides, and eclipses.	Students can design models to show the rotation and revolution of the Earth. Students can also model one Earth day in relationship to the sun.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students design models to show the rotation and revolution of the Earth. Students can also create a model to show on Earth Day.
ES.2.10. Analyze how the features of the oceans affect humans.	Students can describe the features of the ocean.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students identify the features of the ocean from illustrations.
ES.2.11. Compare the ability to support life on Earth and other objects in space.	Students can compare and contrast the life supporting abilities of the Earth and our moon.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students use a Venn diagram to compare and contrast the life supporting abilities of the Earth and our moon.
ES.2.12. Explain and compare the properties (*gravity*, size, shape, distance, and color) of objects in the *solar system*.	Students can name and describe objects in our solar system.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students create a bulletin board or a model with the objects in our solar system. They should be able to name and describe the objects.

Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
ES.2.13. Explore past, present, and future space technology.	Students can describe the history of space exploration from the first satellites to the present.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students construct a timeline with the history of space exploration from the first satellites to the present.
ES.2.14. Relate the physical characteristics of the sun to other stars.	Students can compare our sun to other stars.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students compare the size of our sun to stars.

STRAND 3: EARTH/SPACE SYSTEMS CONTENT STANDARD 3 Students will demonstrate an understanding of the connections and applications of earth /space systems.			
Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
ES.3.1. Design and conduct scientific investigations to answer different kinds of questions.	Students can design and conduct a scientific experiment.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Set up student teams to conduct an experiment (e.g., measure the average slope of the school ground).
ES.3.2. Apply multiple strategies to problem solving.	Students can research various print and nonprint resources to find solutions for scientific problems.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students research a problem for a solution and then determine which solution is the most scientifically sound.

Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
ES.3.3. Use appropriate equipment, tools, techniques, technology, mathematics, and technical writing in scientific investigations.	Students are aware of and practice safety rules and can identify these rules on exams.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students take written tests on safety rules and practice them in laboratory activities.
ES.3.4. Investigate a variety of earth science related careers.	Students research careers in soil science and geology.	Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students use print and nonprint resources to research careers in the earth sciences.
ES.3.5. Construct models of earth science systems and make real world applications.	Students build models to illustrate the effects of erosion on different slopes and vegetation.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students build models on different slopes and vegetation. Use gardening spray to simulate rain.
ES.3.6. Analyze the impact of human activities on the Earth's *crust*, *hydrosphere*, *atmosphere*, and *biosphere* (e.g., climate change, *greenhouse effect*, global warming, ozone depletion, and *UV radiation*) and demonstrate methods of conservation and recycling of the Earth's resources	Students can analyze the impact of human activities on the Earth.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students develop skits about the impact of human activities on the Earth.

Student Learning Expectations	Fifth Grade Benchmarks	Assessments	Strategies/Activities
ES.3.7. Explore the impact of space technology on society.	Students can identify space technology that has benefited people on Earth.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students use print and nonprint resources to research space technology that has benefited people and illustrate or present the result of their research.
ES.3.8. Illustrate the positive and negative effects of human use of natural resources on Earth.	Students can describe how man uses natural resources in a positive and negative manner.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students demonstrate how human use of resources can have positive and/or negative impact on the environment.
ES.3.9. Measure weather conditions using appropriate equipment.	Students can effectively and safely use materials and equipment to measure weather conditions.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students use weather charts, thermometers, wind speed indicators and computers to measure and predict weather conditions.
ES.3.10. Calculate the gravitational forces of objects in space.	Students can describe gravitation forces on objects.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students illustrate how space satellites and falling objects on Earth move because of gravity. Use iron filing on a sheet of paper and a magnet below to illustrate gravitational pull.

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