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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 kindergarten students. Each content standard is explained and includes student learning expectations, kindergarten benchmarks, assessments, and strategies and activities. (YDS)

# Kindergarten Grade Level Science Sample Curriculum



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## Kindergarten Grade Level Science

| STRAND 1: PHYSICAL SYSTEMS<br>CONTENT STANDARD 1<br>Students will demonstrate an understanding of physical systems as a process of inquiry. | | | |
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| **Student Learning Expectations** | **Kindergarten Benchmarks** | **Assessments** | **Strategies/Activities** |
| PS.1.1. Examine the techniques of *scientific inquiry*, problem solving, questioning, reasoning, and creative decision making by utilizing the *scientific method*. | Students will name the observable properties and characteristics of objects.<br><br>Students will describe an observation orally or pictorially.<br><br>Students will work in small groups to collect information.<br><br>Students will make predictions and test them. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Demonstration<br>Log/Journal | Present students with a flower, odd shaped rock, old computer part or some object with which they may not be familiar. Have them observe, name properties, and collect information.<br><br>Sort objects by attributes.<br><br>Make predictions about sinking and floating. |
| PS.1.2. Use simple equipment (microscopes), age-appropriate tools (rulers, thermometers), skills (describing and writing), technology (computers) and mathematics in scientific investigations. | Students can recognize that objects are different sizes.<br><br>Students count at a beginning level. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Log/Journal | Have students sort objects by size.<br><br>Have students count groups up to ten.<br><br>Use a string to measure the circumference of objects such apples, pumpkins, etc.<br><br>Allow students to observe nature objects with hand-lens or hand-held microscopes. |
| PS 1.3. Communicate designs, procedures, and results of scientific investigations (graphs, charts, and writings). | Students can draw or paint pictures about nature scenes.<br><br>Students can make graphs with objects used in the classroom. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Portfolio<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Log/Journal | Allow students to create nature scenes such as the weather, animals, or plants.<br><br>Have students graph their favorite objects such as food, toys, etc, |

| STRAND 1: PHYSICAL SYSTEMS<br>CONTENT STANDARD 2<br>Students will explore, demonstrate, communicate, apply, and evaluate the knowledge of physical systems. | | | |
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| **Learning Expectations** | **Kindergarten Benchmarks** | **Assessments** | **Strategies/Activities** |
| PS.2.1. Recognize the differences and similarities of *solids, liquids* and *gases.* | Students can recognize water, milk, and orange juice as a liquid. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Log/Journal | Students can recognize a liquid. The teacher pours several liquids to demonstrate how each flows.<br><br>Students can pour liquids from container to container to observe how they flow.<br><br>Students can test objects to see which ones sink or float. |
| PS.2.2. Understand the physical properties of objects. | Students recognize ice and water. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Exhibition<br>Demonstration | Students can recognize that ice and water are the same thing but in different forms. Place an ice cube outside in the sunlight on a sidewalk and observe changes over time or freeze water and periodically observe how the liquid turns to a solid. |
| PS.2.3. Learn about the physical world by observing, data collecting, using age-appropriate tools, describing, and hypothesizing. | Students know that learning comes from careful observation. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Log/Journal<br>Essay Writing | Allow students a short period to observe something (an object or an animal) and compare that to a longer period of observing. |
| PS.2.4. Revise *hypothesis* by sharing and communicating observations through writing. | | | |
| PS.2.5. Explore energy changes. | Students know the effects of sun and shade on the same object. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Exhibition<br>Demonstration | Make images with sun sensitive paper or grow a plant in shade or in full sunlight. |
| PS.2.6. Identify *chemical* and *physical changes.* | | | |
| PS.2.7. Classify simple machines and relate them to inventions and discoveries. | | | |

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| PS.2.8. Explore the effects of applying various types of *forces* to an object (push/pull). | | | |

| **STRAND 1: PHYSICAL SYSTEMS**<br>**CONTENT STANDARD 2**<br>**Students will explore, demonstrate, communicate, apply, and evaluate the knowledge of physical systems.** | | | |
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| **Learning Expectations** | **Kindergarten Benchmarks** | **Assessments** | **Strategies/Activities** |
| PS.2.9. Identify and compare the relationships between *mass/weight, force,* and *motion.* | | | |
| PS.2.10. Examine properties, types, and uses of magnets. | Students learn through play that magnets stick to some objects.<br><br>Students learn that magnets move by push and pull. | Observation<br>Exhibition<br>Demonstration | Have students explore with magnets in an activity center. |
| PS.2.11. Analyze and compare the relationship between magnets and electricity. | | | |
| PS.2.12. Experiment with *static* and *current electricity.* | | | |
| PS.2.13. Determine the relationship between vibration and sound. | | | |
| PS.2.14. Explore the properties of light (e.g., *reflection, refraction, absorption, translucent, transparent,* opaque). | | | |

| **STRAND 1: PHYSICAL SYSTEMS**<br>**CONTENT STANDARD 3**<br>**Students will demonstrate an understanding of the connections and applications of physical science.** | | | |
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| **Learning Expectations** | **Kindergarten Benchmarks** | **Assessments** | **Strategies/Activities** |
| PS.3.1. Understand that physical science is interwoven into the structure of all disciplines. | | | |
| PS.3.2. Recognize that mathematics is the basis of communication in physical science. | | | |
| PS.3.3. Understand that tools allow tasks to be done more easily. | | | |

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| PS.3.4. Explore physical science related careers. | | | |

| STRAND 2: LIFE SCIENCE SYSTEMS<br>CONTENT STANDARD 1<br>Students will demonstrate an understanding of life science as a process of inquiry. | | | |
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| **Learning Expectations** | **Kindergarten Benchmarks** | **Assessments** | **Strategies/Activities** |
| LS.1.1. Utilize the *scientific method* to investigate life sciences. | Students will name the observable properties and characteristics of objects.<br><br>Students will describe an observation orally or pictorially.<br><br>Students will work in small groups to collect information.<br><br>Students will make predictions and test them. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Log/Journal<br>Essay Writing | Fill clear jars with different materials such as cotton balls, popcorn, sand, water, rice, small rocks, etc. and shake to determine the lightest, heaviest, sounds, no sounds, etc. Students work in teams to collect information and report to the class. |
| LS.1.2. Select age-appropriate equipment and utilize technology and mathematics in the inquiry of life science. | Students can recognize that objects are different sizes.<br><br>Students begin to learn to count. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Demonstration<br>Log/Journal<br>Essay Writing | Have students compare objects of various sizes within a group (leaves, rocks, etc.) and count the number in each group. |
| LS.1.3. Generate graphs, writings, and charts to communicate life science investigations. | Students can draw or paint pictures about nature scenes.<br><br>Students can make graphs with objects used in the classroom. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Portfolio<br>Checklist<br>Performance-based Test<br>Demonstration<br>Log/Journal | Draw and paint different ecosystems such as a forest, pond, or marine.<br><br>Have students make charts or graphs, e.g. hair color, eye color, etc. |

| STRAND 2: LIFE SCIENCE SYSTEMS<br>CONTENT STANDARD 2<br>Students will explore, demonstrate, communicate, apply and evaluate the knowledge of life systems. | | | |
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| **Learning Expectations** | **Kindergarten Benchmarks** | **Assessments** | **Strategies/Activities** |
| LS.2.1. Identify and compare characteristics of living and nonliving things. | Students can identify living objects. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Log/Journal | Identify living objects by bringing pets from home and comparing to nonliving things in the classroom. Pets should not be kept overnight. |
| LS.2.2. Explore cells in *organisms*. | | | |
| LS.2.3. Identify and investigate the functions of body systems in *organisms*. | Students can name exterior body parts on people and animals. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Log/Journal | Using stuffed animals brought from home, have the students play a game such as "Do the Hokey Pokey" to identify body parts.<br><br>Have students name and identify the five senses and the associated body parts. |
| LS.2.4. Recognize patterns and characteristics of *organisms*. | | | |
| LS.2.5. Explore the life cycles of *organisms*. | | | |
| LS.2.6. Name some common animals that no longer exist (e.g., dinosaurs and mammoths). | Students can name common household pets. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Essay Writing | Name common household pets. Have students bring pet pictures from home. |
| LS.2.7. Understand that offspring are similar to their parents. | Students can identify from pictures similar parents and offspring. | Teacher-made Test<br>Teacher Observation<br>Portfolio<br>Checklist<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Log/Journal<br>Essay Writing | After reading a book about animals, have students match the parents and offspring. |

| Learning Expectations | Kindergarten Benchmarks | Assessments | Strategies/Activities |
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| LS.2.8. Identify the features of plants and animals that enable them to live in different environments. | Students can name common plants and animals. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Exhibition<br>Log/Journal<br>Essay Writing | Play a matching game similar to Bingo with cards showing animals and plant pictures of names that are called out. |
| LS.2.9. Define and describe a *food chain* and a *food web*. | Students can name foods animals and humans eat. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Portfolio<br>Checklist<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Log/Journal<br>Essay Writing | After reading a book about farms, have students name foods that animals and humans eat. |
| LS.2.10. Understand that *organisms* are interdependent. | | | |

| STRAND 2: LIFE SCIENCE SYSTEMS<br>CONTENT STANDARD 3<br>Students will demonstrate an understanding of the connections and applications in life sciences. | | | |
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| **Learning Expectations** | **Kindergarten Benchmarks** | **Assessments** | **Strategies/Activities** |
| LS.3.1. Understand that life sciences are interwoven into all disciplines. | | | |
| LS.3.2. Recognize that mathematics is the basis of communication in life science. | | | |
| LS.3.3. Identify that humans change environments in ways that can be beneficial or detrimental for themselves and other *organisms*. | | | |
| LS.3.4. Explore careers related to life sciences. | | | |

| STRAND 3: EARTH/SPACE SYSTEMS<br>CONTENT STANDARD 1<br>Students will demonstrate an understanding of the inquiry process through the study of earth and space systems. | | | |
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| **Learning Expectations** | **Kindergarten Benchmarks** | **Assessments** | **Strategies/Activities** |
| ES.1.1. Utilize the *scientific method* to investigate earth/space systems. | Students will name the observable properties and characteristics of objects.<br><br>Students will describe an observation orally or pictorially.<br><br>Students will work in small groups to collect information.<br><br>Students will make predictions and test them. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Log/Journal<br>Essay Writing | Have students sort collections of rocks or marbles based on properties and characteristics. Students should identify similarities and differences and work in small groups to collect observations.<br><br>Have students observe shadows at different times of the day and predict the direction and length of shadows. |
| ES.1.2. Select appropriate equipment and utilize technology and mathematics in the inquiry of earth/space systems. | Students can recognize that objects are different sizes.<br><br>Students begin to learn to count. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Log/Journal<br>Essay Writing | Sort rocks by size and have the students count the rocks.<br><br>Sort objects from nature, such as rocks or leaves, according to similarities and differences. |
| ES.1.3. Generate graphs, writings, and charts to communicate earth/space systems investigations. | Students can draw or paint pictures about nature scenes.<br><br>Students can make graphs with objects used in the classroom. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Portfolio<br>Performance-based Test<br>Exhibition<br>Demonstration | Have students create nature scenes.<br><br>Have students draw a night scene and a day scene and make a Venn diagram for comparison. |

| STRAND 3: EARTH/SPACE SYSTEMS<br>CONTENT STANDARD 2<br>Students will explore, demonstrate, communicate, apply and evaluate knowledge of the properties of earth and space systems. | | | |
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| **Learning Expectations** | **Kindergarten Benchmarks** | **Assessments** | **Strategies/Activities** |
| ES.2.1. Recognize and classify different types of earth materials. | Students know that the Earth's surface is composed of different types of materials of various sizes. | Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Log/Journal<br>Essay Writing | Take a walk on the playground and look for different types of rocks and soils. Discuss other parts of Arkansas or other states that students have seen and compare to the playground. |

| Learning Expectations | Kindergarten Benchmarks | Assessments | Strategies/Activities |
|---|---|---|---|
| ES.2.2. Describe major features of the earth's surface and how it is affected by natural changes. | Students can name stormy conditions such as rain, sleet, and snow.<br><br>Students know that the surface of the earth can vary from high to low. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Portfolio<br>Checklist<br>Performance-based Test<br>Demonstration<br>Log/Journal<br>Essay Writing | Have students keep daily weather recordings and name the conditions.<br><br>Have students feel a 3-D map of the Earth and discuss the highs and lows on the surface. |
| ES.2.3. Identify the natural divisions of Arkansas. | Students can identify the outline map of Arkansas. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Demonstration<br>Log/Journal<br>Essay Writing | Identify the shape of Arkansas. |
| ES.2.4. Understand that the Earth is layered (*crust, mantle, and core*). | Students can identify soil as small rocks, decayed matter, and water. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Log/Journal<br>Essay Writing | Have students look at a soil sample under a hand lens to identify its makeup. |
| ES.2.5. Investigate seasonal changes in weather and factors that affect weather conditions. | Students know that the sun changes position during the day.<br><br>Students understand that bright, sunny days mean good weather and that dark cloudy skies can mean rain. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Demonstration<br>Log/Journal<br>Essay Writing | Create a simple sundial and observe the shadow during the day.<br><br>Keep a daily weather record and mark days as sunny, cloudy, very cloudy, and rainy. |
| ES.2.6. Describe the *water cycle.* | Students can identify precipitation, clouds, and puddles. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Log/Journal<br>Essay Writing | Have students identify where puddles may form on the playground. * Check their predictions when it rains.<br><br>Have students draw pictures of clouds and different kinds of precipitation (snow, sleet, rain, hail). |

| Learning Expectations | Kindergarten Benchmarks | Assessments | Strategies/Activities |
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| ES.2.7. Discuss land forms in the ocean and how they change. | Students can identify the ocean on a map. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Log/Journal<br>Essay Writing | Have students observe a classroom globe and find the oceans. |
| ES.2.8. Analyze the features and motions of the sun, moon, earth and other celestial bodies (e.g., *solar system*, moon phases, earth's *rotation* and *revolution*). | | | |

| STRAND 3: EARTH/SPACE SYSTEMS<br>CONTENT STANDARD 3<br>Students will demonstrate an understanding of the connections and applications of earth and space systems. | | | |
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| **Learning Expectations** | **Kindergarten Benchmarks** | **Assessments** | **Strategies/Activities** |
| ES.3.1. Understand and appreciate the uses of water. | Students can name the importance of water to people, animals, and plants. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Log/Journal<br>Essay Writing | Purchase two identical plants and have the students water one but not the other one, observe and record the results. |
| ES.3.2. Describe uses and conservation of materials taken from the earth. | | | |
| ES.3.3. Identify the effect humans have on the environment (e.g., use and misuse). | | | |
| ES.3.4. Understand how earth/space systems connect to other disciplines. | | | |

| Learning Expectations | Kindergarten Benchmarks | Assessments | Strategies/Activities |
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| ES.3.5. Recognize the importance of mathematics as the basis of communication in earth/space systems. | | | |
| ES.3.6. Use age-appropriate equipment, tools, techniques, technology, and mathematics in *scientific investigation* of earth/space systems. | Students can recognize that objects are different sizes.<br><br>Students begin to learn to count. | Statewide Test<br>Teacher-made Test<br>Teacher Observation<br>Checklist<br>Performance-based Test<br>Exhibition<br>Demonstration<br>Log/Journal<br>Essay Writing | Have students sort objects by size and count them.<br><br>Have students weigh and measure objects of different sizes. |
| ES.3.7. Explore careers related to earth/space science. | | | |

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