

**Arkansas Department of Education**

**Science Performance Level Descriptors**

**Grade 5 and Grade 7 Science Benchmark  
Examinations**

**Science Performance Level Descriptors**  
**ACTAAP Grade 5 Benchmark Examinations**

PERFORMANCE LEVEL	DEFINITION
<b>Basic</b>	<p>Fifth-grade students performing at the basic level demonstrate some of the knowledge and reasoning required to understand the nature of science, life, physical, and Earth and space science at a level appropriate to grade 5. For example, they can carry out simple investigations using processes, safety procedures, equipment, and technology.</p> <p><i>Fifth-grade students performing at this level</i></p> <ul style="list-style-type: none"> <li>• Demonstrate knowledge of the characteristics of the processes of science</li> <li>• Describe the characteristics, structure, and functions of living systems</li> <li>• Demonstrate knowledge of populations and ecosystems</li> <li>• Communicate knowledge of matter, including properties and changes</li> <li>• Demonstrate emerging knowledge of motion and forces</li> <li>• Define energy and give examples of transfer of energy</li> <li>• Recognize basic elements of Earth</li> <li>• Demonstrate an emerging knowledge of fossils</li> <li>• List the order of the planets</li> </ul>
<b>Proficient</b>	<p>Fifth-grade students performing at the proficient level demonstrate the knowledge and reasoning required for understanding the nature of science, life, physical, and Earth and space science at a level appropriate to grade 5. In addition, students can perform simple investigations, formulate solutions to familiar problems, and communicate their results.</p> <p><i>Fifth-grade students performing at this level</i></p> <ul style="list-style-type: none"> <li>• Describe cell functions and parts of living cells</li> <li>• Diagram and explain the flow of energy through various ecosystems</li> <li>• Investigate physical properties and changes in the states of matter</li> <li>• Classify real-world examples of simple machines</li> <li>• Classify potential and kinetic energy</li> <li>• Conduct investigations using light energy</li> <li>• Identify the basic elements and minerals</li> <li>• Compare and contrast the three basic rock types</li> <li>• Explain how physical evidence from fossils supports the theory that Earth has changed over time</li> <li>• Compare the physical properties and characteristics of celestial bodies in the universe</li> </ul>

<b>Advanced</b>	<p>Fifth-grade students performing at the advanced level demonstrate a solid understanding of the nature of science, life, physical, and Earth and space science as well as the ability to apply their understanding to practical situations at a level appropriate to grade 5. For example, they can perform and critique simple investigations, make connections from one or more of the sciences to predict or conclude, and apply fundamental concepts to practical applications.</p> <p><i>Fifth-grade students performing at this level</i></p> <ul style="list-style-type: none"> <li>• Apply scientific data using various procedures</li> <li>• Compare and contrast plant and animal cells</li> <li>• Evaluate the human impact on the ecosystem</li> <li>• Analyze and describe the physical properties and changes in the states of matter</li> <li>• Compare and contrast potential and kinetic energy as applied to motion</li> <li>• Differentiate between physical interactions of light and matter</li> <li>• Conduct investigations to identify the basic elements and minerals</li> <li>• Conduct investigations in relation to Earth, its moon, and other planets in our solar system</li> </ul>
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**Science Performance Level Descriptors**  
**ACTAAP Grade 7 Benchmark Examinations**

PERFORMANCE LEVEL	DEFINITION
<b>Basic</b>	<p>Seventh-grade students performing at the basic level exhibit evidence of some knowledge and reasoning required for an understanding of the nature of science, life, physical, and Earth and space science at a level appropriate to grade 7.</p> <p><i>Seventh-grade students performing at this level</i></p> <ul style="list-style-type: none"> <li>• Observe, measure, collect, record, and compute data from investigations</li> <li>• Follow directions and use basic science equipment to perform simple experiments</li> <li>• Have an emerging ability to design an experiment</li> <li>• Recognize the position of planets and their movement around the sun</li> <li>• Know basic weather-related phenomena</li> <li>• Explain changes in position and motion</li> <li>• Have an emerging understanding of the inter-relationships among plants, animals, and the environment</li> </ul>
<b>Proficient</b>	<p>Seventh-grade students performing at the proficient level demonstrate much of the knowledge and many of the reasoning abilities essential for an understanding of the nature of science, life, physical, and Earth and space science, at a level appropriate for grade 7. For example, students can interpret graphic information and analyze simple investigations, and explain such scientific concepts as atmospheric conditions, physical systems, and properties of matter.</p> <p><i>Seventh-grade students performing at this level</i></p> <ul style="list-style-type: none"> <li>• Create, interpret, and make predictions from charts, diagrams, and graphs</li> <li>• Have an emerging understanding of scientific phenomena</li> <li>• Demonstrate understanding of basic plans to solve problems</li> <li>• Describe the structure of living and nonliving systems</li> <li>• Explain Earth's relationship within our solar system</li> <li>• Demonstrate understanding of properties of materials and have an emerging understanding of the particulate nature of the states of matter</li> <li>• Apply knowledge of Newton's laws of motion</li> <li>• Demonstrate a developmental understanding of the flow of energy through nature</li> <li>• Explain the role of reproduction in the continuation of a species</li> <li>• Identify environmental conditions that can affect the survival of individual organisms and entire species</li> <li>• Demonstrate knowledge of energy as it relates to atmospheric conditions and its effects on the environment</li> </ul>

<b>Advanced</b>	<p>Seventh-grade students performing at the advanced level exhibit evidence of a solid understanding of the nature of science, life, physical, and Earth and space science, as well as the abilities to apply their understanding in practical situations at a level appropriate to grade 7.</p> <p><i>Seventh-grade students performing at this level</i></p> <ul style="list-style-type: none"> <li>• Conduct and analyze controlled experiments</li> <li>• Describe energy transfer in living and nonliving systems</li> <li>• Communicate how present physical clues are a key to understanding Earth's history and changes over time</li> <li>• Communicate a solid knowledge of forces and motions within the solar system</li> <li>• Recognize a wide range of physical and chemical properties of matter</li> <li>• Infer relationships between structure and function in living and nonliving systems</li> <li>• Explain the impact of human activities on the environment and the economy</li> </ul>
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