

**Pennsylvania Department of Education
Grade 8 Science Performance Level Descriptors**

Below Basic	Basic	Proficient	Advanced
<p>An eighth-grade student performing at Below Basic Level demonstrates a limited conceptual understanding of science content and an ineffective application of processes in the four Pennsylvania Science Reporting Categories.</p>	<p>An eighth-grade student performing at the Basic Level demonstrates partial conceptual understanding of science content and the application of processes in the four Pennsylvania Science Reporting Categories.</p> <p>A student performing at the Basic Level</p> <p>A. compares scientific theory to opinion; identifies inferences, descriptions, conclusions, explanations, predictions, results, and models; applies scientific process skills, appropriate measurements, and tools to solve problems; and describes systems.</p> <p>B. compares structural functions of organisms; identifies levels of organization; identifies adaptation, mutation, and biotechnology as variables of biological changes; identifies traits by type; and identifies major biomes and components and factors affecting community change.</p> <p>C. identifies elements, compounds, and mixtures; categorizes matter by properties; identifies kinetic and potential energy; describes balanced, unbalanced, frictional and gravitational forces on objects; identifies simple machines; and distinguishes between renewable and nonrenewable energy sources.</p> <p>D. describes basic rock types; identifies changes in Earth's surface; identifies soil types; describes the water cycle; identifies characteristics of water systems; recognizes weather patterns and distinguishes between climate types; and identifies the relationships between and among the objects of our solar system.</p>	<p>An eighth-grade student performing at the Proficient Level demonstrates a general conceptual understanding of science content and the application of processes in the four Pennsylvania Science Reporting Categories.</p> <p>A student performing at the Proficient Level</p> <p>A. contrasts scientific theory and opinion; develops inferences, descriptions, explanations, predictions, models, and critiques based on evidence; designs experiments to solve problems; describes system components; and communicates conclusions.</p> <p>B. categorizes organisms; relates structure to function; describes relationships between gene mutations, adaptations, natural selection, and biotechnology; compares gene dominance in the expression of traits; and identifies relationships within ecosystems and human impacts on the environment.</p> <p>C. differentiates between elements, compounds, and mixtures; describes components of simple chemical reactions; explains heat transfers and conversions; describes inertia and momentum; describes the function of simple machines; and distinguishes between forms and sources of energy.</p> <p>D. explains the rock cycle; compares changes in Earth's surface; explains the formation of soils and fossils; describes the physical processes in the water cycle; compares water systems; describes factors affecting regional weather or climate; describes the relationships between and among the objects of our solar system; and describes impacts of technological processes.</p>	<p>An eighth-grade student performing at the Advanced Level demonstrates a thorough conceptual understanding of science content and the application of processes in the four Pennsylvania Science Reporting Categories.</p> <p>A student performing at the Advanced Level</p> <p>A. explains the development and evolution of scientific theories; analyzes inferences, descriptions, explanations, predictions, results, models, and critiques; analyzes the effectiveness of experimental designs; evaluates system changes and components; and evaluates conclusions.</p> <p>B. explains the relationship between structure and function within organisms; connects concepts of natural selection to survival needs; makes inferences about how selection processes effect changes in human and natural systems; describes the impact of genetic changes over time on populations; and uses evidence to describe relationships within ecosystems and human impacts on the environment.</p> <p>C. explains the structures and the physical and chemical properties of matter; uses properties to distinguish one substance from another; uses heat transformation and conversions to evaluate forms of energy; compares the effect of forces on objects; explains mechanical advantage of simple machines; and explains environmental impacts of energy choices.</p> <p>D. classifies rocks by type; relates changes in Earth's surface to rock types, soil formation, and fossil formation; analyzes physical characteristics of water resources; explains global weather patterns and their impact on local weather and climate; explains the relationships between and among the objects of our solar system; and evaluates the impact of human-made processes on resources.</p>