Grade 7 Science Overview (PA STEELS Standards) [August 2025]

A guide to learning Science in Grade 7@OJRSD

Grade 7 Science builds a strong foundation in life science, chemistry, and environmental systems. Through investigations, models, and real-world problem solving, students develop critical thinking skills that prepare them for Grade 8 science and future STEM learning.

Students explore living systems, Earth's resources, matter, and energy. Instruction follows the Pennsylvania STEELS Standards and emphasizes inquiry, data analysis, modeling, and real-world problem solving. Students examine how organisms interact with their environment, how matter cycles through systems, and how cells and genes influence life.

Unit 1: Ecosystem Dynamics & Biodiversity

Students explore how organisms interact within ecosystems and why biodiversity is essential for stability.

Students will:
Analyze how resource availability affects populations.
Predict interactions among organisms across ecosystems.
Examine how ecosystem changes impact populations.
Evaluate solutions that help protect biodiversity.

Real-World Connection: Students investigate conservation efforts and design local solutions to support healthy ecosystems.

Unit 2: Earth's Resources & Human Impact

Students examine how humans use Earth's resources and how those choices affect the planet.

Students will:
Distinguish between renewable and non-renewable resources
Investigate pollution and habitat destruction
Analyze how population growth impacts Earth's systems
Explore sustainable practices and environmental technologies

Real-World Connection: Students reflect on their environmental footprint and propose ways to reduce human impact.

Unit 3: Matter Cycling in Ecosystems
Students study how matter moves through living and nonliving parts of ecosystems.

Students will:
Model how matter and energy cycle through ecosystems.
Explore photosynthesis, respiration, and decomposition.
Examine how human activities disrupt natural cycles.
Propose solutions to reduce environmental disruption.

Real-World Connection: Students connect nutrient cycles to issues such as climate change and agriculture.

Unit 4: Chemical Reactions – Matter & Energy
Students are introduced to chemistry concepts and how chemical reactions support life.

Students will:
Model atoms and simple molecules.
Determine whether chemical reactions have occurred.
Explain how matter is conserved during reactions.
Explore how synthetic materials come from natural resources.

Real-World Connection: Students analyze chemical reactions related to environmental and biological systems.

Unit 5: Cells and Systems
Students investigate cells as the basic unit of life and how systems work together.

Students will:
Gather evidence that all living things are made of cells.
Model how cell parts contribute to function.
Explain how body systems interact.
Explore how sensory systems respond to stimuli.

Real-World Connection: Students connect cell systems to health and survival.

Unit 6: Metabolic Reactions
Students focus on how organisms obtain and use energy to survive.

Students will:
Compare photosynthesis and cellular respiration.
Model how food molecules release energy.
Investigate enzyme function.
Analyze energy flow in organisms.

Real-World Connection: Students connect metabolism to growth, health, and sustainability.

Unit 7: Genetics & Heredity
Students explore how traits are inherited and how variation occurs.

Students will:
Examine DNA structure and genetic information.
Analyze inheritance patterns and genetic variation.
Model how mutations can affect organisms.
Compare sexual and asexual reproduction.

Real-World Connection: Students explore ethical questions related to genetic technologies.

Engineering & Design (Throughout the Year)
Across all units, students apply engineering practices by defining problems, designing and testing solutions, analyzing data, and refining models based on evidence.