Middle School Earth & Space Science (8th Grade, NGSS-Aligned)

This course is designed for older middle school students (8th grade) to explore Earth and physical science concepts, including the stars and planets, weather and climate, rocks and minerals, mountains and soil, as well as core physical science topics such as motion, forces, chemical reactions, density, and buoyancy. Instruction emphasizes NGSS-aligned practices, engaging students in asking meaningful scientific questions, conducting investigations, analyzing data, and constructing evidence-based explanations.

Weekly live lectures and hands-on labs provide interactive learning experiences. Students complete textbook readings, homework, lab reports, and assessments independently at home. Each student designs and completes a science fair project by the end of the second semester, with optional field trips offered to enhance real-world understanding. All lab supplies are provided for in-person learners.

Standards Alignment (California NGSS – Middle School Earth, Space & Physical Science)

MS-ESS1-1, MS-ESS1-2, MS-ESS1-3: Earth's place in the universe; properties of planets and stars

MS-ESS2-1, MS-ESS2-2, MS-ESS2-4, MS-ESS3-1: Earth's systems, weather, climate, rocks, soil, and geological processes

MS-PS1-1, MS-PS1-2, MS-PS1-4, MS-PS1-5: Matter and chemical reactions

MS-PS2-1, MS-PS2-2, MS-PS2-4: Motion, forces, and interactions

MS-ETS1-1, MS-ETS1-2, MS-ETS1-3: Engineering and problem-solving applications

Science & Engineering Practices: Asking questions, planning and carrying out investigations, analyzing data, developing models, and constructing explanations

Crosscutting Concepts: Cause and effect, systems and system models, energy and matter, structure and function, stability and change

High School Earth & Space Science (8th Grade, NGSS-Aligned)

HS-ESS1: Earth’s Place in the Universe
HS-ESS1-1 – Use evidence of star life cycles to explain element formation
HS-ESS1-2 – Construct explanations of the Big Bang theory
HS-ESS1-3 – Communicate scientific ideas about the universe’s scale
HS-ESS1-4 – Use models to predict Earth’s orbital changes and climate impacts
HS-ESS2: Earth’s Systems
HS-ESS2-1 – Model cycling of Earth’s materials and energy flow

HS-ESS2-2 – Analyze geoscience data for Earth’s surface changes
HS-ESS2-3 – Develop models of plate tectonics
HS-ESS2-4 – Use models to explain water cycling driven by energy
HS-ESS2-5 – Plan investigations of weather and climate interactions
HS-ESS2-6 – Use geoscience data to explain climate change
HS-ESS2-7 – Explain how Earth systems interact at different scales
HS-ESS3: Earth and Human Activity
HS-ESS3-1 – Explain uneven distribution of natural resources
HS-ESS3-2 – Evaluate solutions for resource sustainability
HS-ESS3-3 – Use evidence to predict natural hazards
HS-ESS3-4 – Evaluate how human activity affects Earth systems
HS-ESS3-5 – Analyze data linking human activity and climate change
HS-ESS3-6 – Design solutions to reduce human impacts