

## Earth Science – Credit Recovery

**COURSE DESCRIPTION:** Earth Science is the branch of science devoted to studying the planet Earth and all the objects in the universe. This course begins with an introduction to the processes, methods, and tools of scientific inquiry. An understanding of the geology of Earth is built through units that discuss topics such as rocks and minerals, plate tectonics, and Earth's natural resources. The structure and function of the atmosphere as well as situations that cause changes in the atmosphere build student's understanding of Earth's atmosphere. The study of oceanography is introduced with such topics as seafloor features and ocean currents. Weather, climate, and climate change are topics that begin to develop an understanding of meteorology. Throughout the course students develop an understanding of how Earth's systems and cycles work together to make life on Earth possible. The students also take a tour of the universe as they discuss its formation, the characteristics of the objects in our solar system, and the universe beyond our solar system. Throughout the course, they see examples of how individuals have built our knowledge of Earth and the universe through invention, innovation, and discovery.

### COURSE OBJECTIVES:

- Explain the processes, methods, and tools of scientific inquiry.
- Distinguish among beliefs, scientific laws, and scientific theories and between the questions science can answer and those it can't.
- Summarize the impact of science on daily life, society, the environment, and human history.
- Describe the formation, structure, composition, distinguishing properties, and classification of minerals and rocks.
- Summarize how the location of rocks and minerals around the world affect both economies and politics.
- Explain the laws, principles, and methods used to date fossils and other Earth materials, and to put geological events in chronological order.
- Analyze the relationship between natural selection and biological diversity over the course of Earth's history.
- Describe the structure of Earth and its uniqueness in the solar system.
- Relate how various geological processes are still shaping Earth as a result of plate tectonics.
- Describe the structure, composition, features, functions, and global patterns of the atmosphere and the ocean systems of Earth.
- Identify the impact of the atmosphere-ocean system on world climate, as well as how this system is affected by pollution and the greenhouse effect.
- Compare and contrast physical, chemical, and biological weathering.
- Summarize how each type of weathering affects both natural landscapes and man-made structures.
- Identify and describe each step in the hydrologic cycle.
- Discuss how rivers form, flow, form landscape features, and interact with human settlements.
- Identify and describe glacier types and the various landscapes associated with them.
- Analyze the role of erosion in the formation of Karst topography, coastlines, deserts, and eolian systems and identify where and how humans can limit this erosion.
- Identify the steps in Earth's carbon cycle and the effect of excess carbon on the land, water, and atmosphere.
- Describe the processes, procedures, and environmental impacts associated with the use of nuclear energy, fossil fuels, and renewable energy resources.
- Summarize the formation, structure, and composition of the universe and the objects found in it as well as how that knowledge has grown over the course of history.
- Describe how man and unmanned missions to the objects in our solar system have added to our understanding of both our solar system and the universe at large.

**PREREQUISITES:** None

**COURSE LENGTH:** Two Semesters

**REQUIRED TEXT:** No required textbook for this course

**MATERIALS LIST:** No required materials for this course

**COURSE OUTLINE:**

**Module I: Introduction to Earth Science**

- Lesson 1 – Scientific Inquiry
- Lesson 2 – The Process of Inquiry
- Lesson 3 – The Limits of Science
- Lesson 4 – Science and Society
- Lesson 5 – Investigating Your World
- Lesson 6 – Scientific Models
- Lesson 7 – Studying Earth
- Lesson 8 – The Right Tools
- Lesson 9 – Earth's Systems

**Module II: Rocks and Minerals**

- Lesson 1 – Minerals
- Lesson 2 – Classifying Minerals
- Lesson 3 – Classifying Minerals Lab
- Lesson 4 – Igneous Rocks
- Lesson 5 – Sedimentary Rocks
- Lesson 6 – Metamorphic Rocks
- Lesson 7 – The Rock Cycle
- Lesson 8 – Rock Structures and Deformation
- Lesson 9 – Uses of Rocks and Minerals
- Lesson 10 – Rock Identification Lab

**Module III: Geologic History**

- Lesson 1 – Minerals
- Lesson 2 – The Chemistry of Dating
- Lesson 3 – The Laws of Layers
- Lesson 4 – Relative Dating
- Lesson 5 – Absolute Dating
- Lesson 6 – The Fossil Record
- Lesson 7 – Geologic Time Scale
- Lesson 8 – Natural Selection and Evolution
- Lesson 9 – The History of Life

**Module IV: Plate Tectonics**

- Lesson 1 – Earth's Structure

- Lesson 2 – Plate Tectonics
- Lesson 3 – Plate Boundaries
- Lesson 4 – Earthquakes and Tsunamis
- Lesson 5 – Volcanoes
- Lesson 6 – Plate Tectonics and the Landscape
- Lesson 7 – Seafloor Features
- Lesson 8 – Be Prepared

**Module V: The Atmosphere-Ocean System**

- Lesson 1 – The Atmosphere
- Lesson 2 – The Greenhouse Effect
- Lesson 3 – Wind
- Lesson 4 – The Ocean
- Lesson 5 – Currents
- Lesson 6 – Climate
- Lesson 7 – Weather
- Lesson 8 – Pollution
- Lesson 9 – Climate Change
- Lesson 10 – Oxygen in the Atmosphere Lab

**Module VI: Weathering and Soils**

- Lesson 1 – Weathering
- Lesson 2 – Weathering Rates
- Lesson 3 – Weathering and the Landscape
- Lesson 4 – Soil Formation
- Lesson 5 – Soil Properties
- Lesson 6 – Soil Orders
- Lesson 7 – Soil and Society
- Lesson 8 – Mass Movement
- Lesson 9 – Investigating Soils Lab

**Module VII: Rivers and Groundwater**

- Lesson 1 – The Water Cycle
- Lesson 2 – Watersheds
- Lesson 3 – Rivers
- Lesson 4 – Stream Erosion
- Lesson 5 – Stream Deposition
- Lesson 6 – Floods
- Lesson 7 – Groundwater
- Lesson 8 – Groundwater Flow
- Lesson 9 – Groundwater Uses and Conservation

**Module VIII: Landscape Features**

- Lesson 1 – Types of Glaciers

- Lesson 2 – Glaciers and the Landscape
- Lesson 3 – Karst Topography
- Lesson 4 – Caves
- Lesson 5 – Coastal Erosion
- Lesson 6 – Shoreline Features
- Lesson 7 – Eolian Systems
- Lesson 8 – Desertification

**Module IX: Earth's Natural Resources**

- Lesson 1 – Earth's Carbon Cycle
- Lesson 2 – Fossil Fuels
- Lesson 3 – Electricity Generation and the Environment
- Lesson 4 – Fission and Fusion
- Lesson 5 – Nuclear Reactors
- Lesson 6 – Nuclear Energy and the Environment
- Lesson 7 – Energy Types
- Lesson 8 – Alternative Energy Sources
- Lesson 9 – Impact of Renewable Energy
- Lesson 10 – Mineral Resources

**Module X: The Solar System**

- Lesson 1 – History of Beliefs About the Universe
- Lesson 2 – Structure and Composition of the Universe
- Lesson 3 – Life Cycle of Stars
- Lesson 4 – Our Solar System
- Lesson 5 – The Sun
- Lesson 6 – The Moon
- Lesson 7 – Inner Planets
- Lesson 8 – Outer Planets
- Lesson 9 – Space Exploration

**CREDITS:** [High School Credits – Semester 1](#), [High School Credits – Semester 2](#)