

# EARTH SCIENCE CURRICULUM

## SIXTH GRADE

### *THEME: OUR EARTH*

#### **Goal**

Earth science focuses on the composition, formative processes, and history of the Earth, solar system and universe. Investigations of Earth include the four main systems: the atmosphere, the hydrosphere, the biosphere, and the geosphere. Each system is composed of unique characteristics, which interrelate to compose the system of the universe.

- 1. Science Processes and Inquiry – The student will engage in investigations that lead to the discovery of science concepts.**
  - a. Develop and evaluate a hypothesis by examining and comparing evidence.
  - b. Select and use appropriate tools and technology to perform tests, collect and display data.
  - c. Use the Scientific Method
  - d. Practice the use of SI units.
  - e. Construct appropriate graphs from data. Develop qualitative statements about the relationships between variables.
  - f. Communicate the steps and results of an experiment using written reports and verbal presentations.
  - g. Recognize changes in natural phenomena over time.
  - h. Practice safety procedures in all science activities.
  
- 2. Earth’s History – The student will determine that evidence from rocks allows us to understand the history of the Earth.**
  - a. Analyze past continental movements. Compare/contrast the Earth processes of today to those in the past. Infer that slow geologic processes have large cumulative effects over long periods of time.
  - b. Determine that the history of life on Earth has been disrupted by major catastrophic events, such as the impact of asteroids or comets, enormous volcanic eruptions, earthquakes, periods of continental glaciations, and the rise and fall of the sea level.
  - c. Define the rock cycle. Observe that a rock bears evidence of the minerals, temperature, and forces that formed it.
  - d. Identify rocks and minerals.
  - e. Explain how fossils are formed. Determine that fossils provide evidence of how life and environmental conditions have changed.

- f. Describe how movements of the Earth's continental and oceanic plates combined with changes in climate have affected the past and present distributions of living organisms.
- g. Construct a geologic timeline illustrating significant developments and extinctions of plant and animal life.

**3. Structures of the Earth System – The student will explore the four main systems of the Earth: the atmosphere, the hydrosphere, the biosphere, and the geosphere.**

- a. Explain the composition, properties, and structure of the atmosphere.
- b. Examine evidence that atmospheric properties can be studied to predict atmospheric conditions and weather hazards:
  - \*Humidity
  - \*Temperature
  - \*Wind Speed and Direction
  - \*Air Pressure
  - \*Precipitation
- c. Assess the use of technology in predicting, monitoring, and recording atmospheric phenomena.
- d. Identify cloud types. Describe how clouds are formed.
- e. Explain the composition, properties, and structure of the hydrosphere.
- f. Identify the various types of water formations (e.g. rivers, lakes, bays, etc.).
- g. Examine how the hydrosphere provides nourishment, transportation, and energy.
- h. Identify the properties, life zones, and motions of the Earth's oceans.
- i. Describe the influence that oceans have on the temperature/climate of the Earth.
- j. Explain the biosphere.
- k. Analyze factors that contribute to where an animal lives.
- l. Compare/contrast plant and life forms in various biomes.
- m. Describe the main characteristics of the geosphere.
- n. Identify the Earth's layers.
- o. Explore how the geosphere controls the distribution of minerals, rocks, and soils, and how it generates natural hazards that shape the land and impact humans.
- p. Evaluate the human impact on each of the systems of the Earth.

**4. Shaping the Earth's Structure – The student will discover that land forms result from constructive and destructive forces.**

- a. Determine that the fit of the continents, location of earthquakes, volcanoes, and midocean ridges provide evidence of plate tectonics.
- b. Infer that major geologic events, such as earthquakes, volcanic eruptions, and mountain building results from plate motions.
- c. Examine the topography of the Earth. Interpret topographical maps.
- d. Determine that water running downhill is the dominant process in shaping the landscape.
- e. Describe how material is eroded and transported by running water.
- f. Describe the process of weathering and soil erosion.

- 5. Energy in the Earth's System – The student will explore how the transfer of energy affects the Earth's surface.**
- Explain how the sun is the major source of energy (powering wind, ocean currents, and water cycle).
  - Describe how solar energy reaches the Earth through radiation.
  - Determine that heat, from the interior of the Earth, reaches the surface through convection. Analyze how this heat is distributed in the atmosphere and oceans.
  - Explain how the difference in heat, air movement and pressure, and humidity result in changes of weather.
- 6. Earth in the Solar System – The student will determine that the structure and composition of the universe can be learned from the study of stars and galaxies.**
- Describe the appearance, general composition, relative position and size, and motion of objects in the solar system, including planets, planetary satellites, comets, and asteroids.
  - Explore stars, constellations, and galaxies.
  - Interpret scientific theories concerning the components, patterns, and cycles of the solar system.
  - Relate the influence of the sun and the moon's orbit to the gravitational effects produced on Earth.
  - Associate the revolution of Earth around the sun and the tilt of the Earth's axis with the seasons.
  - Determine how to use astronomical units and light years as measures of distance between the sun, stars, and Earth.
  - Describe space exploration.

Experiential Location Suggestions

School Grounds

Back Yards

Weather Station

Oxley Nature Center

Other Theme Ideas:

*Conformity*

*Form*

*Structure*

*Transition*

*Time*