Unit Title: **Earth Science**  
Grade Level: **6th grade**  
Subject/Topic Area(s): Science  
Designed By: Mikki Carroll

**Duration:** 9 Weeks

**Brief Description and Purpose Statement:**
Students will investigate how Earth's surfaces have changed over time. They will learn how the Earth’s crust is broken down into soil and what forces have changed the physical features of Earth’s landforms externally and internally (e.g. water, wind, ice, volcanoes). They will understand the differences between weathering, erosion, and deposition. Students will learn how a sinkhole occurs as well as other mass movements, in addition, what the interior parts of Earth are made of. We will research how mountains, volcanoes, and earthquakes are formed and or move due to tectonic plate activity. We will investigate how natural disasters occur like tsunamis taking a closer look at what happened in Japan as a case study. While studying Earth’s surfaces we will also learn how fossils help scientists learn about plants and animals from the past through fossils and sedimentary rocks.

**Stage 1 – Desired Results**

**Enduring Understanding(s):** Students will understand how Earth’s surfaces have changed over time and what forces have impacted these changes.

**Enduring Wellness and Cultural Understandings:** Students will understand that changes occur due to forces beyond their control.

**Essential Question(s):**
How has gravity impacted changes to Earth’s surface?

**Students will know . . . (knowledge)**
- Earth’s composition
- Plate activity is both fast and slow
- How landforms are created
- What forces affect landform development
- Weathering, erosion, deposition
- Mass movements
- Vibrations of matter
- Every object exerts gravitational force
- Sedimentary, igneous, and metamorphic rock formations
- Fossil records and evolution

**Students will be able to do . . . (skills)**
- Identify landform forces
- Explain weathering, erosion, and deposition
- Describe how carbonic acid forms and dissolves soil & rock
- Read a topographic map
- Read a Richter scale
- A photo essay
- A news broadcast
Standards and Benchmarks

5-8 Benchmark II: Describe the structure of Earth and its atmosphere and explain how energy, matter, and forces shape Earth’s systems.

Structure of Earth
1. Know that Earth is composed of layers that include a crust, mantle, and core.
2. Know that Earth’s crust is divided into plates that move very slowly, in response to movements in the mantle.
3. Know that sedimentary, igneous and metamorphic rocks contain evidence of the materials, temperatures, and forces that created them.

Changes to Earth
7. Know that landforms are created and change through a combination of constructive and destructive forces, including:
   - Weathering of rock and soil, transportation, deposition of sediment, and tectonic activity
   - Similarities and differences between current and past processes on Earth’s surface (e.g. erosion, plate tectonics, changes in atmospheric composition)
   - Impact of volcanoes and faults on New Mexico geology.
8. Understand the history of Earth and how information about it comes from layers of sedimentary rock, including:
   - Sediments and fossils as a record of a slowly changing world
   - Evidence of asteroid impact, volcanic and glacial activity.

5-8 Benchmark II: Explain the physical processes involved in the transfer, change, and conservation of energy.

4. Understand that some energy travels as waves (e.g. seismic, light, sound) including,
   - The sun as source of energy for many processes on Earth
   - Different wavelengths of sunlight (e.g. visible, ultraviolet, infrared)
   - Vibrations of matter (e.g. sound, earthquakes)
   - Different speeds through different materials

5-8 Benchmark III: Describe and explain forces that produce motion in objects

1. Know that every object exerts gravitational force on every other object dependent on the masses and distance of separation (e.g. tides)
2. Know that gravitational force is hard to detect unless one of the objects (e.g. Earth) has a lot of mass.

5-8 Benchmark I: Explain the diverse structures and functions of living and complex relationships between living things and their environments.

2. Describe how weather and geologic events (e.g. volcanoes, earthquakes) affect the function of living systems.
5-8 Benchmark II: Understand how traits are passed from generation to the next and how species evolve.

1. Understand that the fossil record provides data for how living organisms have evolved.
2. Describe how species have responded to changing environmental conditions over time (e.g. extinction, adaptation)

Stage 2 – Assessment Evidence
Culminating and Ongoing Assessment(s):
1. Buckle Down Practice
2. Hiking Field Trip Activity (El Calderon Volcano Cinder Cone)
3. Homework Progress Classroom Graph
4. Vocabulary Index Cards
5. Science Journal
6. Scientific Portfolio
7. Lab Works
9. Picture Dictionary
10. Changes of Earth Landform Worksheet
11. Mountain, Volcanoes, & Earthquakes Worksheet
12. How Earth’s Surface has Changed Worksheet
13. Photo Essay
14. News Broadcast
15. Model of Volcano, tectonic plate activity, or earth’s interior
16. Tests/Quizzes
17. Graphs: Bar, Seismic

Stage 3 – Learning Plan
What learning experiences and instruction will enable students to achieve the desired results? How will the design…
W = Help the students know Where the unit is going and What is expected? Help the teacher know Where the students are coming from (prior knowledge, interests) and Where to connect the curriculum to the NACA Mission and Core Values?
H = Hook all students and Hold their interest?
E = Equip students, help them Experience the key ideas and Explore the issues?
R = Provide opportunities to Rethink and Revise their understandings and work?
E = Allow students to Evaluate their work and its implications?
T = Be Tailored (personalized) to the different needs, interests, and abilities of learners?
O = Be Organized to maximize initial and sustained engagement as well as effective learning?

Week 1: Introduction to Earth Science with Grand Canyon investigation, Quick-writes: What happened to the Grand Canyon? Explain in your own words how you think the canyon was
formed? Journey to the Center of Earth Movie. (*testing week*)

Week 2: Changes in Earth Landforms worksheets, Vocabulary Word Index cards (18 words) (*testing week cont.*)

Week 3: Earth Landforms Picture Dictionary (20 Pages), El Calderon Volcano Cinder Cone Hiking Field trip, Physical & Chemical Weathering power point.

Week 4: Earth Song by educational rap.com, Study Jams Video: Weathering and Erosion, Water, Wind & Ice Lab

Week 5: The Rock cycle, Sedimentary Igneous, & Metamorphic rock stories, Rocky Fossil Lab

Week 6: Mountains, Volcanoes & Earthquakes worksheets, Plate tectonic PB&J Lab, Volcano/Earth Food Model

Week 7: Natural Disasters; Japan’s Tsunami report, and Mount St. Helen Photo essay

Week 8: News broadcast headline reporting

Week 9: News broadcast headline video taping

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**Resources:**

Harcourt Science Textbook  
6th Grade Science Curriculum by Ms. Jennifer John  
Scienenetlinks.com  
Library: San Pedro  
National Geographic.com  
www.scilinks.org/harcourt  
[www.educationalrap.com](http://www.educationalrap.com)  
http://science.pppst.com/erosion.html  
Ring of Fire  
Volcano Hunters  
Volcano: The eruption and healing of Mount St. Helen by Patricia Lauber  
[www.si.edu/harcourt/science](http://www.si.edu/harcourt/science)  
Smithsonian Institute  
http://science.pppst.com/rocks.html

**Field Trips:**

El Calderon Volcano Cinder Cone