

Faulty Rocks  
Classroom Program  
by Heather McGiffert  
revised 8/20/00 and 1/10/01

- Grade: Fifth
- Subject: Geology/Earth Science
- Theme: Plate Tectonics and weathering generate forces that shape the Earth's surface creating unique landscapes like Red Rock Canyon and a constantly changing planet.
- Goal: Students will gain experience in describing interactions and effects of natural forces on the earth's surface.
- Curriculum: CCSN (5)1.1
- Objectives: Students will be able to:  
-Understand, through activities and demonstrations the forces and processes involved in shaping the Earth's surface.  
-Identify two to three forces and processes occurring here at Red Rock Canyon NCA.
- Materials: Experiment Worksheet  
Model of the Earth Worksheet  
Earth Model  
2 large trays  
Sand  
Dirt  
Milky Way Bar  
Cup of Water  
Air Can  
Fold Models
- Vocabulary: anticline- a fold which bends downwards (like an upside down U)  
compression- a type of force typified by pushing (like an accordion)  
core- the innermost layer of the earth, composed of iron and nickel, subdivided into inner and outer core, the inner core is solid metal  
crust- the outermost layer of the earth, rocky and rigid  
deposition- the laying down of soil or rock by water, wind or ice  
erosion- the wearing away of soil or rock by water, wind, or ice  
mantle- the second layer of the earth, which behaves plastically according to plate tectonic theory  
plate tectonics- the theory which states that the Earth's crust isn't a solid mass, but is composed of several plates which can move apart, slide past one another, collide, or run over one another  
syncline- a fold whose arms bend upward (like the letter U)
- Background: The study of the earth is called geology. The crust of the earth is what you see, touch, and walk on. Many gradual processes such as weathering and erosion affect the crust of the

earth. Other rapid events such as earthquakes, rock slides, and volcanic activity also influence the geology of the Earth. Rocks found on the earth are formed differently – by heat and pressure, by erosion and weathering, by volcanic activity. At Red Rock Canyon these forces are apparent in the Keystone Thrust, and the sandstone found throughout the Conservation area.

#### Key Concepts:

The earth consists of layers - crust, mantle, and core.  
Rocks are formed differently – igneous, metamorphic, sedimentary.  
Plate Tectonics is essential to understanding geology.  
Forces of weathering and erosion affect the earth.  
These forces can be gradual processes or rapid events.  
Red Rock Canyon displays the combined effort of these forces in its rocks and landscapes.

#### Activities:

**Pre-Visit:** Go over vocabulary with student's, try to engage them in discussions about different landforms (mountains, volcanoes, valleys, and how they may have formed). Main point is that the earth is changing and things are being built up and then brought back down.

#### During Visit:

1. Discuss some of the forces at work on the Earth. Get students to answer and attempt to differentiate between rapid and gradual processes. Show interior of earth diagram and have students fill out worksheet. Explain that plate tectonics operate within the earth to change the surface of the earth.

2. Mountain of Mud Experiment- Have students predict what will happen when water is poured on mountain of dirt. Pour water on dirt, use this to explain concepts of erosion and deposition. Then add rocks to mountain and discuss how this might make a difference. Main concept here is that there are differing rates of erosion depending of certain things, size being one of them. Discuss what other factors influence erosion and deposition. Show erosion pictures as examples of water erosion.

3. Sand Storm Experiment- Have students make predictions about what will happen when they blow on the sand. Ask for a few volunteers and have them blow on the pile of sand. Discuss what is happening, sand is being eroded from higher up and deposited lower down. Then use air blower to again demonstrate that these processes are variable. Show cross-bed picture as example of this process at Red Rock Canyon.

4. Bendable-Breakable Earth- Show Milky Way bar and explain how it models the earth (chocolate is the crust, underneath is the mobile mantle (caramel). Use it to display what happens when you push ends together (compression). Explain how this creates mountains and earthquakes, and also folds. Use fold models to show the difference between a syncline and an anticline.

#### Post-Visit:

Further discussion could include discussing what will happen in the future to mountains like those at Red Rock. Also have the students do a creative writing activity (attached worksheet), and if you'd like you can send a copy to us and we'll post some of them on the internet.

#### Conclusion:

Geology and the forces of nature have influenced the landscape found at Red Rock Canyon.

## Creative Writing Activity

One form of creative writing is poetry. The Cinquain poem does not need to rhyme. It describes a natural object different way. Just follow the directions below to write your Cinquain (pronounced Sin-cane; French or Spanish for five).

- Name your object in one word. \_\_\_\_\_
- Write 2 descriptive words about your object. \_\_\_\_\_
- Write 3 action words about your object. \_\_\_\_\_
- In 4 or 5 words describe its relationship to the environment. \_\_\_\_\_  
\_\_\_\_\_
- Sum up your feelings about the object in one word. \_\_\_\_\_

Here's an example of a Cinquain poem:

Ant  
Small, Strong  
Climbing, Stinging, Gathering  
Little Scavenger of the Desert  
Persistence