

# Mud pile Mountain

## Lesson Overview:

The students will explore the effect of soil erosion and deposition changes Rio Grande River and how it affect life on the people live by both sides of the river. Erosion landforms illustrated by this activity are streams, canyons and waterfalls. Depositional features illustrated are alluvial fans and deltas. Also involved is the transport of materials by water – fine particles are carried “Further” than large particles.

## Objectives:

- Identify forms caused by erosion.
- Identify landforms caused by deposition.
- Develop observational and measurement skills.
- Develop safe practices during field investigations.

## Texas Essential Knowledge and Skills (TEKS):

### Science, Grade 6

- Science 111.18 (1A) demonstrate safe practices during field and laboratory investigations as outlined in the Texas Safety Standards;
- Science 111.18 (2B) design and implement experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;
- Science 111.18 (2C) collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers;
- Science 111.18 (3D) relates the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.
- Science 111.18 (6C) identifies forces that shape features of the Earth including uplifting, movement of water, and volcanic activity.

### Math, Grade 6

- Math 6.6A/ use angle measurements to classify angles as acute, obtuse, or right.
- Math 6.8B/ select and use appropriate units, tools, or formulas to measure and to solve problems involving length, area.

## **Math, Grade 7**

- Math 7.9A/ estimate measurements and solve application problems involving length (including perimeter...), and area of polygons.

**Age:** grades 4-6

**Subject:** Erosion and deposition

**Skills:** observation, inference, measurement

**Duration:** 1-3 hours

**Group size:** any

**Setting:** outdoors

**Key vocabulary:** erosion, deposition, transport, alluvial fan, delta, canyon

### **Materials:**

- 3 popsicle sticks/tongue depressors per student
- Crayons-red, green, orange, blue, yellow, purple
- Shovel
- Watering can
- Some bedding plants, grasses, or weeds.

### **Procedures:**

1. Have each student rule lines 1 centimeter apart across both sides of a Popsicle stick, starting from one end. Then have them crayon centimeter wide bands, neatly, in this order: red, green, orange, blue, yellow, purple.
2. Take the class outside to a patch of bare ground and dig up dirt, removing larger pebbles and stones. Dump it in a pile and tamp it down to make a “mountain” about half a meter high.
3. Transplant some clumps of grasses or weeds randomly on the “mountain” slope and the surrounding “land”.

4. Have the students push their sticks into the “mountain” and the surrounding “land”, red ends out, so that they are at right angles to the surface and evenly distributed. The boundary between the orange and blue bands should be even with the surface.
5. Have the students sprinkle the “mountain” with a watering can so that the “rain” falls straight down. Let everyone in the class have a chance to be the “rainmaker”.
6. After the “mountain” is well eroded, ask the following questions:
  - Do the markers indicate where erosion is taking place? Where?
  - Are some places being built up? Where?
  - Which of these features can you identify:
    - Streams
    - Canyons
    - Waterfalls
    - Lakes
    - Deltas
    - Alluvial fans
  - Which is carried further by the water, sand or silt?
  - What, if anything, seems to slow erosion on the “mountain”?
  - Let the class continue to erode the “mountain” and observe it for several days.

**Journal entry:** How does knowledge of erosion and deposition of soil of the river bed help people cross the river safely into the United States.

**Teachable Moment:** The Power of Language- Ethnocentrism and History

Words like “coyote” and “mojado” have become part of the lexicon of our world. That said 'Mojados' or 'mojaditos' is a derogatory offensive term. 'Wetback' was used in the printed literature back in the 1950s, 1960s and even 1970s...just not acceptable today. We should bring this up and talk about the origin of such terms. Of course, “mojado” refers to individuals who swam across the border and so had “wet backs.” On this side of the border to be referred to by this term suggested you were not legally here. For example, at UTPA the Mexican American Studies club actually experienced similar thing-- someone wrote 'mojado' across their flyer announcing a meeting. The club presented a grievance to the Dean of Students and filed a report with the campus police.

“Coyote” of course has many meanings. There is of course the dog-like mammal known for lurking in the shadows and stealing domesticated animals. Historically, in colonial Latin America people were categorized based on their family background. These categories are known as “Castas” and were based on the color of one’s skin or its “cast.” For them “De Indio y mestiza nace coyote,” or “From a male Indian and a mixed (European and Indian) woman is born a coyote.” Today “Coyote” refers to the people who “lurk in the shadows” and lead people into the United States. Obviously, much can be read into its meaning and that should be a point of discussion with your students when considering “identity,” within the context of ethnocentrism and history.

**Evaluation:**

Have the student identify an erosion landform and a depositional landform from pictures of Rio Grande River Valley and delta areas

<http://www.google.com/images?um=1&hl=en&tbs=isch:1&q=rio+grande+river+pictures&sa=N&start=252&ndsp=18>

and pictures from

<http://www.earthscienceworld.org/images/search/results.html?Keyword=Alluvial+Soils>

**References:**

1. Rockcastle, N., & Schmidt, V. (ISS8) Teaching Science with Everyday Thing. New York: McGraw-Hill Book Co.
2. <http://www.sd5.k12.mt.us/glaciereft/geoer3-8.htm>