



Erosion – Grades 3-5

Nebraska Science Standards

5.4.2.a Describe the characteristics of rocks, minerals, soil, water, and the atmosphere

5.4.2.b Identify weathering, erosion, and deposition as processes that build up or break down Earth's surface

5.4.4.a Describe how slow processes (erosion, weathering, deposition) and rapid processes (landslides, volcanic eruptions, earthquakes) change Earth's surface

Objective: Students will identify and describe characteristics of Earth's materials and their changes over time through erosion and weathering.

Materials (provided by CSM):

- Erosion worksheet (Grades 3-5)
- Sand
- Pans
- Rulers
- Paper Cups
- Scissors
- Tape

Materials (provided by the classroom):

- Water
- Thick textbook (or other item to prop up the pan)

Discussion (Questions to ask the students, if there is a white board, have the students volunteer to come up and draw them)

- What are the different types of landforms? What do you know about them?
 - Mountains
 - Mountains are formed when molten rocks from deep within the earth rise to the surface, pouring out in the form of lava from volcanoes.
 - Sometimes the tectonic plates (if the students don't know this word, please explain it) on the earth's crust move towards each other. This squeezes the rocks deep below the earth's surface up to form mountain ranges
 - Mountain ranges include the Rocky Mountains. A volcano is a type of mountain.
 - Hills

- Hills are covered with grass and are lower than mountains but higher than surroundings.
 - Valleys
 - Valleys are low lying areas between mountains or hills.
 - Typically, valleys are formed by water wearing down rocks to carve out grooves or by glaciers.
 - A narrow valley is called a canyon.
 - Can you name an example of a canyon?
 - Grand Canyon
 - Plateaus
 - Plateaus are flat on top with high, steep sides.
 - Their formation is similar to mountains, but the rock doesn't break.
 - Plains
 - Flat land formations
 - Nebraska is part of the Great Plains
 - Islands
 - Land that is surrounded by water on all sides
 - Deserts
 - Hot climate typically with sand dunes - huge hills of sand formed by the winds
- What types of things can cause a change in landforms over time?
 - Wind
 - Water
 - Ice (like glaciers)
 - Gravity
- What is weathering?
 - Weathering is the breakdown of rock which is called sediment.
 - Weathering agents: water, wind, ice, growing plants
- What is erosion?
 - Erosion is the movement of sediment (broken rock from weathering) from one location to another
 - Eroding agents: water, wind, ice, gravity
- What is deposition?
 - Deposition is the dropping of sediment in a new location
 - Broken rock from weathering is moved through erosion and ends up as a deposit in a new place
 - For example, wind can drop sand to form sand dunes.

Activity Description:

Students will predict how erosion works by building their own landforms in sand and observe how the flow of water (river) can change their structures.

Setup:

- Set up the materials at the front of the class.
- Have the students come up when it is their turn to get materials.

- Students will work in small groups. Provide each student with a worksheet and walk them through Steps 1-7 as you have them do the procedure.
- Before they put the water in their cup, have them complete Step 8 (hypothesis). Once they are done pouring the water in, they can finish the worksheet.

Procedure:

1. Fill each pan with sand (roughly 2-3 inches) and provide one pan to each group.
2. Students will work together to make a few landforms which could include hills, mountains, volcanoes, and/or caves
3. Have the students tape a ruler near one end of their pan. The students should also secure a cup on top of the ruler over the pan. The students will poke a hole in the cup with their pencil so that water can drip out onto the sand slowly.
4. Next, have students prop up the pan on one end with a book, a thick science book works great!
5. The pans came with plastic lids, so ensure they are under the pans, just in case the water overflows
6. Have the students answer the worksheet questions through number 8.
7. Let the students fill up their cups with water. Do not overfill the cups.
8. Let the students sit and watch for a few minutes as water trickles out forming a “river” and finally collecting to form a bigger body of water. There are no mistakes with this activity. If the student’s water goes straight down into the sand, they have created groundwater.
9. Ask the students if the water (river) is acting as a weathering agent or an eroding agent?