

Changing Landscape

Lesson Summary:

In this lesson, students will learn how erosion shapes the land around them. They will also learn that there are different types of erosion (e.g., splash erosion or waves, fluvial or water, wind, and chemical). Students will also identify ways to prevent erosion.

References:

Lesson adapted with permission from:

1. A to Z Teacher Stuff @ www.atozteacherstuff.com, “Identifying Erosion.”
2. The Educator’s Reference Desk @ www.eduref.org, “Water & Soil Erosion.”

Teacher Resources:

Classroom Activities

- *Identifying Erosion, One Playground at a Time* – page 198
 - Time: Approximately 50 minutes
 - Materials:
 - ✓ 1 Potted Plant
 - ✓ A Playground or Parking Lot
 - ✓ *Worksheet: What Did You See?* (included)
- *Washing Away the Sand* – page 200
 - Time: Approximately 45 minutes
 - Materials:
 - ✓ A Bag of Sand
 - ✓ A Jug of Water
 - ✓ A Toothpick
 - ✓ Some Tissues
 - ✓ 2 Small Styrofoam/Paper Cups
 - ✓ 3 Baking Sheets

Worksheets

- *What Did You See?* – pages 199
- *Washing Away the Sand* – page 201

Supplemental Lesson Resources:

Power Point Presentation

- “Changing Landscape” – available at: www.mccrearywater.com/funzone/powerpoint17

Video

- “Changing Landscape” – available at: www.mccrearywater.com/funzone (approximately 4 minutes)



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Objectives:

Science:

SC-04-4.7.2

Students will:

- describe human interactions in the environment where they live;
- classify the interactions as beneficial or harmful to the environment using data/evidence to support conclusions.

All organisms, including humans, cause changes in the environment where they live. Some of these changes are detrimental to the organism or to other organisms; other changes are beneficial (e.g., dams benefit some aquatic organisms but are detrimental to others). By evaluating the consequences of change using cause and effect relationships, solutions to real life situations/dilemmas can be proposed.

DOK 3

Social Studies:

SS-05-4.1.4

Students explain how factors in one location can impact other locations (e.g., natural disasters, building dams).

SS-04-5.1.1

Students will use a variety of primary and secondary sources (e.g., artifacts, diaries, and timelines) to describe significant events in the history of Kentucky and interpret different perspectives.

DOK 2

SS-04-5.2.3

Students will compare change over time in communication, technology, transportation and education in Kentucky.

DOK 3

Writing:

WR-04-1.2.2

In Personal Expressive/Literary Writing,

- Students will communicate main idea through use of literary elements appropriate to the genre.
- Students will develop characters (fictional/non-fictional) through thoughts, emotions, actions, descriptions or dialogue when appropriate.
- Students will develop plot/story line appropriate to the form.
- Students will develop an appropriate setting, mood, scene, image or feeling.
- Students will apply literary or poetic devices (e.g., simile, metaphor, personification) when appropriate.
- Students will incorporate reflection, insight and analysis when appropriate.

Lesson Plan:

In the last lesson, we learned that erosion has an impact on the health of the environment. Erosion can make our lakes, rivers, and streams dirty. It can make it hard or, in some cases, impossible for fish to breathe. This lesson is designed to get you thinking about the impact that erosion has on the landscape. Mountains, rocks, rivers, lakes, plains, and beaches are all shaped and impacted by the effects of erosion. Erosion is the process of wearing away.

We know from the last lesson that water is a cause of erosion. Waves crashing on the shore, flowing streams moving over rock beds, and rain beating down on the earth all contribute to different types of erosion. Can anyone think of something besides water that might contribute to erosion? In other words, can you think of something besides water that might “wear away” at dirt or rocks?

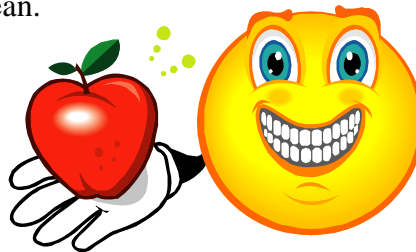
The most common type of erosion is from water. But there are other types of erosion. Wind, glaciers, and chemicals can also be causes of erosion. Blowing wind can carry dirt and rocks to new places. Slow moving glaciers can push materials as they move along. Chemicals can become mixed with water or dumped on the ground and eat away at rock beds and landscapes. All of these things affect the landscape you see around you.

When rain falls down to the ground and begins to break down rocks, soils, and minerals, it is called weathering. Water also washes soil, sand, and minerals from land into bodies of water (e.g., rivers, lakes, oceans). This build up of soil, sand, and minerals is called sediment. The affects or erosion change the landscape in many ways. Erosion helps to shape the world you see around you.

Here’s what to do...

1. Explain that the earth has different layers (like an apple).
2. Hold up an apple and tell the students that if the apple were the earth, the skin would represent the “crust.”
3. Cut the apple in half and show the students how only a very small layer of the earth is “crust.”
4. The inside of the apple represents the mantle
5. The seed coat represents the outer core
6. And the seed represents the inner core
7. Explain that the apple skin (crust) is smooth and even but the earth is uneven, varying in thickness from six to forty miles deep.
8. Review the physical features of the earth’s surface. (e.g., mountains, valleys, rolling hills, plains, rivers, oceans, canyons)
9. Erosion impacts all of these features. Erosion can make jagged things smooth or high things low. It can even wash land away into the ocean.

Earth’s Layers	
Crust	6 – 40 miles
Mantle	1,800 miles
Outer Core	1,375 miles
Inner Core	1,750 miles



Classroom Activity: Identifying Erosion, One Playground at a Time

In this activity, students will learn to identify the impact of erosion on the landscape around them. They will also discuss ways to prevent erosion from taking place. It will take about 50 minutes to complete this activity. You'll need 1 potted plant, a playground or parking lot, and copies of the *Worksheet: What Did You See*. The worksheet is included on the following page.

Here's what to do...

1. Take a potted plant out of the pot, with soil intact. Discuss how the roots of the plant help to hold the soil in place. Explain that vegetation is one thing that helps to prevent erosion. Ask what would happen if the plant was not in the pot, but in the ground and water kept running over it. This would be an example of water erosion. Ask students what would happen if wind kept blowing on the soil (you might want to hold up a fan in front of the plant for visual effect).
2. Ask students if and where they have ever seen the effects of erosion. Record their answers.
3. Explain that the class is going to go out to the playground to examine the effects of erosion on our playground and surrounding school property. Ask students to remember how plants hold soil and to pay special attention to the placement of trees and shrubs on the school grounds.
4. Have students take a pencil, notebook and their *Worksheet: What Did You See* with them. Explain that they should draw evidence of erosion on the school property and answer the questions on the worksheet.
5. As a class, point out evidence of erosion on the school grounds. Some good examples are often near drains, drain pipes, and at the edges of the blacktop.
6. Then have each student pair up with a partner to examine the rest of the area to look for other signs of erosion. Explain that they should look for bald spots, slopes with runoff, and mud near sidewalks or parking lots. Don't forget to set boundaries where the students may explore.
7. When students find examples of erosion, they are to describe it on their worksheet and draw a rough sketch of it.
8. After students are back in the room, ask them to share what they have written in their journals about the effects of erosion on the playground and school property.
9. Ask if anyone noticed the placement of trees and shrubs. Ask the students if the trees and shrubs were placed in particular areas to help stop the effects of erosion.





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Worksheet: What Did You See?

Name: _____

1. What is the definition of erosion? _____
2. Where have you seen the effects of erosion before? _____

3. What effects of erosion do you see on the school grounds? _____

Draw the effects of erosion that you see below:



4. List some things that can help prevent erosion: _____

Classroom Activity: Washing Away the Sand

In this activity, students will get a hands-on experience with viewing the effects of water erosion. It will take about 45 minutes to complete this activity. You'll need a bag of sand, a jug of water, a toothpick, some tissues, small Styrofoam/paper cups, 3 baking sheets, and copies of the Worksheet: . You can do this activity as a class demonstration or in small groups (depending on the amount of supplies you have). If you do this activity as a class demonstration, you might want to ask for volunteers to assist.

Here's what to do...

Baking Sheet #1 – Sand Plain

1. Fill the baking sheet with sand.
2. Smooth the sand flat so it fills the whole pan to form a “plain.”
3. Use a toothpick to make 10 small holes in the bottom of one Styrofoam/paper cup.
4. Fill a second cup with water.
5. Have one student hold the cup with holes in it 12 inches above the “plain.”
6. Have another student gently pour the water from the other cup into the cup with the holes in it.
7. Have students watch what happens and record their observations on their worksheet.

Baking Sheet #2 – Sand Mountain

1. Fill the baking sheet with sand.
2. Shape a pile of sand into a “mountain.”
3. Re-use the cup with holes.
4. Fill the second cup with water again.
5. Have one student hold the cup with holes in it 12 inches above the center of the “mountain.”
6. Have another student gently pour the water from the other cup into the cup with the holes in it.
7. Have students watch what happens and record their observations on their worksheet.

Baking Sheet #3 – Sand Mountain with Grass

1. Fill the baking sheet with sand.
2. Shape a pile of sand into a “mountain.”
3. Pretend to grow grass all over the “mountain” by covering it with a few tissues.
4. Pat the tissues down lightly so that it is touching the sand everywhere.
5. Re-use the cup with holes.
6. Fill the second cup with water again.
7. Have one student hold the cup with holes in it 12 inches above the center of the “mountain.”
8. Have another student gently pour the water from the other cup into the cup with the holes in it.
9. Have students watch what happens and record their observations on their worksheet.

**Think
About
It!**

Discuss the results.

Have students explain why they think the “mountain with grass” has less erosion than the “mountain” without grass and the “plain.”

Discuss what characteristics of the grass would make the soil not slide.

Discuss the importance of conserving soil by planting trees and grasses.



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Worksheet: Washing Away the Sand

Name: _____

Sand Plain Observations: _____

Sand Mountain Observations: _____

Sand Mountain with Grass Observations: _____

