

The Grand Canyon

4th Grade

Jeremy White, Brent Greene, & Kathleen Waugaman

References:

- Lesson plan from CPS 4th grade Earth Science curriculum guide
- www.nationalgeographic.com/expeditions/lessons/07/g35/canyon35.html

Benchmarks:

(Benchmark B): Summarize the processes that shape the Earth's surface and describe evidence of those processes. ES-10: Describe evidence of changes on Earth's surface in terms of slow processes and rapid processes.

Objectives:

Students will learn about how the Grand Canyon was formed, focusing on how the process of erosion enabled its rock layers to be deposited. They will examine the canyon's layers to see what the areas probably looked like when the layers were created. Students will conclude by creating posters illustrating and describing what the Grand Canyon looks like today and what it looked like when one of its layers was formed. **This lesson should take 2 class periods to complete.

Materials:

Have supplies for pairs of students:

- Computers w/ internet access
- A large rock
- Poster Board
- Map of the United States, showing location of Grand Canyon
- Pictures of the Grand Canyon
- Crayons, markers or colored pencils

Initial Demonstration:

Use the computer to access the above site to find the Grand Canyon on the map of Arizona. They can click to zoom in. Help them find the Colorado River and trace its route from east to west through the canyon. Have students look at the photo of the Grand Canyon available on the website. Other pictures are available at the National Geographic's Grand Canyon: The Hidden Secret and National Parks of the American Southwest. Students should brainstorm how the canyon was formed and discuss their ideas.

Target Observations:

- The Grand Canyon is visible from space since it is so large.

- The canyon stretches across the state of Arizona.
- The Grand Canyon was formed by weathering and erosion over millions of years from the Colorado River.

Target Model:

- The Grand Canyon is one of America’s most amazing landmarks, which was formed by layers of rock being deposited over time and the Colorado River cutting through the rock to make it wider and deeper.
- The different colors exist in parts of the rock and canyons because the rock was deposited there at different times during the event of forming the canyons.

Procedure:

Write the word “erosion” on the board. Ask students to explain what the word means and reinforce all the conditions that cause erosion, which have been previously discussed. Show the students a large rock. Have them guess how the rock may have changed over time due to erosion.

Have students read about how sedimentary rock was formed on Rock Hounds at <http://sln.fi.edu/fellows/payton/rocks/create/sediment/htm>. Ask them to read this page and look at the animation. Help them make sense of the animation: water and wind erode the rock, rain washes pieces of the eroded rock into a body of water, and the water deposits these rock pieces in successive layers. Explain that rivers, lakes and oceans all have small pieces of sand and rock that float in the water and are carried by currents. When they settle on the bottom of the river, lake or ocean, they might stay there and be buried by other pieces of rock or sand. Each of these layers that are left on the bottom has the color and texture of the rock and sand that was left there.

Have students look at the photograph of the Grand Canyon again. Explain that each of these layers was deposited in this manner that they have just learned. How many different layers can they count? How many different colors do they see in the layers? Why do they think the layers look different from each other? Students should recognize that the layers are different because different types of rocks and sand were deposited at different times. Have students find the Colorado River at the bottom of the canyon. Explain that over millions of years, this river eroded the rock layers and made it possible for us to see them. The river once flowed at the top layer, but now it flows where we see it today.

Pass out poster board, markers, crayons, or colored pencils. Assign each pair of students to choose one layer of the Grand Canyon from the website. Look at “Grand Canyon Interpretation” at:

<http://www.edu-source.com/GCpages/CVOpage8.html#anchor562018>.

Make sure that each layer is assigned to at least one pair. Have students draw posters illustrating the things listed below. They should also write captions describing them. Do the drawings on one half of the poster and the captions on the other half.

- What does the Grand Canyon look like today? Describe why it looks this way?
- What did the area that is today the Grand Canyon look like when your layer was being deposited, including plants and animals?

Have students share their posters with the class and describe the layer they investigated.

Target Observations:

- Layered rock is different because different types of rocks and sand were deposited at various times in the formation of the canyon.
- As layers were being formed, the life that existed during that time is reflected in the color and thickness of the layered rock.
- The Colorado River once flowed at the top of the canyon, but over millions of years, it has deepened because of erosion.

Summary:

In this lesson, students focus on how the process of erosion and deposition has created the Grand Canyon in the state of Arizona. They conclude their lesson by preparing posters about the different layers of rocks in the canyon's walls and what that area looked like when their layers were formed.