Lost River Gorge and Boulder Caves
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Lost River Pre Visit Lesson Ideas
Teacher's Guide

Objective: Students will observe the power of water erosion and be able to describe how a waterfall and a pothole are formed.

Materials needed per group:

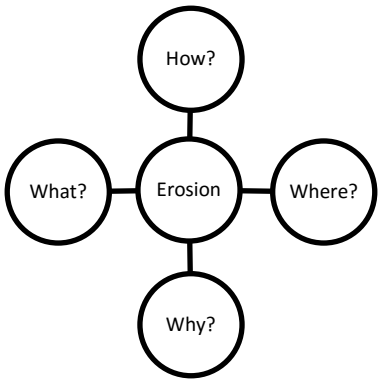
- 2 deep aluminum roasting pans
- 1 small tub of Play Doh or similar clay
- 1 pitcher of water, plus extra water as needed
- Bucket to catch water and sediment run-off
- Sand
- Wood or book to prop up pan
- Box cutter or scissors to cut hole in the pans
- Copy of student worksheet

Prepare:

- Fill one roasting pan for each group with water and put in the freezer until solid. When frozen, chisel a small start to the stream. Cut a 1"x1" hole on one side toward the bottom.

Introduction

As an entire class discuss the meaning of erosion.
Draw a bubble chart on the board. The middle bubble should be labeled "Erosion" and the four bubbles branching off labeled "How" "What" "Why" "Where". Fill in these bubbles with the students' answers.



Examples:
How: *water, wind, ice, waves, rivers, glacial melting*
Where: *beach, mountains, soil, rocks, canyon, gorge, valley, lakes*
Why: *storms, long periods of time, waves, people, clear cutting*
What: *the wearing away of the earth's surface both soil and rocks slowly over time by wind, water, and ice.*
http://nationalgeographic.org/encyclopedia/erosion/

Experiment:
Divide the class into groups of 3-5 students and distribute a copy of the group worksheet and all materials. Explain the groups will be representing the power of water erosion to rocks over time.

Part One:
The groups should see a gorge form in the ice; where the water is poured a pothole should form.

Part Two:
The groups should see a gorge form in the sand. The sand where the stream runs will wash away, but the Play Doh will not, creating a waterfall.

Conclusion: *Answer Guide* (may be done as in groups or individually)

Where might these formations occur? *These formations occur in a gorge or a canyon, also along a river. Acceptable answers would also be any specific gorge or waterfall location.*

How is a waterfall created? *A waterfall is formed when water runs over layers of hard and soft rock. The soft layers of rock will erode, but the hard layers will not.*

How is a pothole created? *A pothole is formed when water eddies and swirls taking debris and sediment with it eroding the rock walls.*

Are these natural formations created rapidly or over long periods of time? *Waterfalls, potholes, and gorges are formed over thousands of years.*

Is the erosion of riverbeds a concern? Why or why not? *Any answer is acceptable with proper explanation.*

New Hampshire Science Standards

S:ESS1:6:5.2 Explain how some changes to the Earth's surface happen abruptly, as a result of landslides, earthquakes and volcanic eruptions; while other changes happen very slowly as a result of weather, erosions and deposition of sediment caused by waves, wind, water and ice.

S:SPS2:4:4.2 Understand that some changes are so slow or so fast that they are hard to see.

S:ESS1:8:5.2 Explain how Earth events, abruptly and over time, can bring about changes on Earth's surface (e.g., landforms, ocean floor, rock features, climate)

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Group Worksheet

Materials Needed:

- 1 empty deep aluminum roasting pan
- 1 pan of ice
- Small tub of Play Doh or similar clay
- Pitcher of water, plus extra water as needed
- Bucket to catch water and sediment run-off
- Sand
- Wood or book to prop up pan
- Box cutter or scissors to cut hole in the pans

Introduction:

Your pan of ice represents a solid rock formation, such as the mountains found around Lost River Gorge in Kinsman Notch. The rock in the mountains is not all created equal. There are two types of rocks forming the walls of Lost River Gorge, Kinsman granite and veins of pegmatite. The second pan, filled with sand, represents these rock layers.

Twenty-five thousand (25,000) years ago ice covered all of New England; even Mount Washington was frozen beneath a sheet of ice more than a mile thick! Environmental conditions changed, and the ice began to melt. As water rushed through what is now Lost River, it carved some of the most dramatic and beautiful shapes in the world. Today, the water at Lost River originates mainly at Mt Waternomee and continues to flow till it reaches the Pemigewasset River. Start your stream to see what kind of features the flowing water might create.

Procedure Part One:

- Cut a small hole on the small side of your pan at the bottom.
- Set your pan on the edge of the table and prop it up with a book or piece of wood.
- Set the bucket underneath to catch the water runoff.
- Start a stream pouring lightly over the ice. Keep a small steady stream going until the bottom of the pan is visible.

Procedure Part Two:

- Fill the second pan approximately two thirds of the way full of sand and pack down tightly
- Smooth out the Play Doh into a sheet that is half as long as the pan. Place the sheet of Play Doh on top of the sand.
- Fill the remainder of the pan with sand and pack down.
- Cut a hole on small side of the pan where the Play Doh is not touching, reaching from the bottom to the top.
- Start a stream pouring lightly over the ice. Keep a small steady stream going until the bottom of the pan is visible.

Date: _____

Group Members: _____

_____

Observations:

1. What happened to the ice where the stream was? _____

   _____

2. Is the gorge formed a uniform width and depth? If not, what formations do you see? _____

   _____

3. What happened to the sand where the stream was? _____

   _____

4. Is the gorge formed a uniform width and depth? If not, what formations do you see? _____

   _____

Conclusion:

1. Where might these formations occur? _____

   _____

2. How is a waterfall created? _____

   _____

3. How is a pothole created? _____

   _____

4. Are these natural formations created rapidly or over long periods of time? _____

   _____

5. Is the erosion of riverbeds a concern? Why or why not? _____

   _____