



SUU STEM CENTER FOR TEACHING AND LEARNING

Coal Creek Trail

This kit includes a lesson for 2nd Grade: Changes in Earth's Surface

SEEd Standard 2.1.1

Develop and use models illustrating the patterns of landforms and water on Earth. Examples of models could include valleys, canyons, or floodplains and could depict water in the solid or liquid state.

Standard 2.1.2

Construct an explanation about changes in Earth's surface that happen quickly or slowly. Emphasize the contrast between fast and slow changes. Examples of fast changes could include volcanic eruptions, earthquakes, or landslides. Examples of slow changes could include the erosion of mountains or the shaping of canyons.

Lesson Plan

Materials:

Worksheet page #1

Yellow and Blue Foam Strips

Cardboard Blocks x3

Inflatable Globe (make sure to drop off items in a secure location so they don't blow away!)

Stop #1: The Bridge

At this stop, students will make observations using their science journals or the provided worksheets.

While on or near the bridge, invite students to make observations. Drawing is a great way to recreate observations. Students may write as well.

Invite students to consider the following:

At this stop, students will make observations using their science journals or the provided worksheets.

Invite students to make observations. Talk about or have students draw examples of the path and rocks in the Coal Creek.

Student Journal:

With a partner, discuss changes you observe that were created by water.

List or draw changes that occurred fast and changes that happened over a long period of time.

Make observations about rocks near the stream. What do the rocks near the stream have in common? How are they different? Where do you think the rocks came from?

Discussion:

Rocks are shaped-round from transport.

Rock sizes vary between very big boulders to very small grains of sand.

The rate of water flow can change and move big rocks or small pieces of rock.

Larger and more angular rocks came from closer sources. Smaller and rounder rocks came from further away. There are variable compositions.

Stop #2: Kayenta

At this stop, students will make observations using their science journals or the provided worksheets.

Invite students to make observations. Talk about or have students draw examples of weathering and erosion.

Student Journal:

Weathering is defined as the breakdown of rock material from larger pieces into smaller pieces.

Erosion is defined as the transportation or movement of rock fragments.

Invite students to consider the following:

Discuss with a partner any evidence of weathering or erosion at this stop.

Draw or list the evidence of weathering and/or erosion.

Weathering:

- Rocks break from bigger to smaller*
- Roots grow in and break rocks*
- Water gets in a crack and freezes*
- Fast and slow changes with weathering*

Erosion and rates of Erosion:

There are ridges or fins of rock separated by gullies. This is because layers that are made of harder rock are more resistant to erosion and form the ridges. The less resistant or softer layers form gullies.

Stop #3: Tilted Layers

At this stop, students will make observations using their science journals or the provided worksheets.

Invite students to make observations. Talk about or have students draw examples of tilted layers.

Materials: Yellow and Blue Foam Strips, Cardboard Fault Blocks

Student Journal:

Can you find areas that show a fast or slow change? What do they look like?

There is a scientific principle in geology called the principle of original horizontality. This means that sedimentary layers are deposited horizontally or flat. Are the layers in a flat position?

Use the foam to show how layers can start off flat but later can be shifted, moved and tilted.

Discussion:

Q: What could have caused them to move that far?

A: Tectonic activity, plates moving, earth moving or shifting

Q: Did they move from horizontal or flat to tilted in a single instance or did it take a long time?

A: It took millions of years for the layers to deform to that extent

Q: Can we tell when the tilting took place?

A: After deposition of the tilted layers, but before deposition of flat layers.

Stop #4: North vs South

At this stop, students will make observations using their science journals or the provided worksheets.

Invite students to make observations. Talk about or have students draw examples of the differences in the North and South sides of the canyon.

Materials: Inflatable Globe

Student Journal:

Compare and Contrast the north and south sides of the canyon. Are there similarities? Are there differences?

- The same layers of rock are exposed on both sides.
- The layers were connected, but the river has removed material from between them forming Cedar Canyon.
- Vegetation on each side

Discussion:

Q: Why are there more plants on the south side than the north side?

A: The north side gets more direct sunlight due to the tilt of Earth on its axis.

Use the inflatable globe to show students the tilt of the Earth. Explain that the sun moves across our sky differently depending on the time of year. That means some areas will get more or less sun depending upon their location. Some areas may be shaded by the sun more often due to the tilt of the Earth.

Stop #5: Red Hill

At this stop, students will make observations using their science journals or the provided worksheets.

Invite students to make observations and talk to each other considering the 4 questions below.

1. How many layers do you see?
2. What do you think caused the layers?
3. Did the layers occur fast or slow?
4. Why?

Discussion:

There are colors that make up different layers or stripes

Three rock types

Igneous- Rocks formed from cooled lava or magma

Metamorphic- Rocks changed by heat and pressure

Sedimentary- Rocks formed from weathering, erosion, and deposition

The rocks present in the Red Hill are all sedimentary rocks hence the layers or stripes that are caused by deposition

With a small group of 3 or 4, closely examine the rock samples given to you. Where do you think the samples came from within the Red Hill? Compare your rock with another group's. What are the similarities and differences? If both samples are sedimentary, why do you think they are different?

Discussion:

Rock properties

Mineral composition

Grain size

Color

Each layer formed in a different environment giving it different characteristics.

Photo examples of different depositional environments

Intertidal, River, Sand dunes

Stop #6: The Park

Lunch and review worksheets, reinforce learning



Name: _____

Coal Creek Trail Worksheet

1. The Bridge	2. Kayenta
3. Tilted Layers	4. North vs. South
5. Coal Creek	6. Red Hill

