The Changing Earth

Lesson Plan

2nd Grade

Sue Bartocci

Performance Expectations

- Use information from several sources to provide evidence that Earth events can occur quickly or slowly (2-ESS1-1)
- Develop a model to represent the shapes and kinds of land and bodies of water in an area. (ESS2-2)

Science and Engineering Practices

- Developing and Using Models: Modeling in K-2 builds on prior experiences and progresses to include using and developing models (diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions. (2-ESS-2)
- Constructing Explanations and Designing Solutions: Constructing explanations and designing solutions in K-2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomenon and designing solutions. Make observations from several sources to construct an evidence-based account for natural phenomena. (2-ESS1-1) Compare multiple solutions to a problem. (2ESS2-1)
- Obtaining information, Evaluating, and Communicating Information: Obtaining, evaluating, and communicating information builds on prior experiences and uses observation and texts to communicate new information. Obtaining information using various texts, text features and other media that will be useful in answering a scientific question. (2-ESS2-3)

Disciplinary Core Ideas

- ESS1.C: The History of Planet Earth: Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1)
- ESS2.A: Earth Materials and System: Wind and water can change the shape of the land. (2-ESS2-1)
- ESS2.B: Plate Tectonics and Large-Scale System Interactions: Maps show where things are located. One can map the shapes and kinds of land and water in any area. (2-ESS2-2)
- ESS2.C: The Roles of Water in Earth's Surface Processes: Water is found in the ocean, river, lakes, and ponds. (2-ESS2-3)
- ETS1.C: Optimizing the Design Solutions: Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (secondary to ESS2-1)

Crosscutting Concepts

- Patterns: Pattern in the natural world can be observed. (ESS2-2)
- Stability and Change: Things may change slowly or rapidly. (2-ESS1-1)

Connections to Engineering, Technology, and Applications of Science

- Influence of Science, Engineering, Technology on Society and the Natural World: Developing and using technology has impacts on the natural world. (2ESS-1)

Connection to Nature of Science:

- Science Addresses Questions About the Natural and Material World: Scientist study the natural and material world. (2ESS2-1)

Common Core Standards

- Draw a picture graph and a bar graph (with single unit scale) a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (CCSS.MathCONTENT2.MD.D.10)
- Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (CCSS.ELA-Literacy-RI2.3)
- Participate in shared research and writing projects (e.g. read a number of books on a single topic to produce a report; record science observation. (CCSS.ELA-Literacy.W2.7)
- Participate in collaborative conversation with diverse partners about grade 2 topics and texts with peers and adults in small group and larger groups. (CCSS.ELA-LiteracySL2.1)

ENGAGE

Students will take a virtual field trip of our National Parks.

National Park Adventure (2016) 42 min. Narrated by Robert Redford
I found it on Netflix. I found that our National Parks have the best landforms.

Books to add to class library

Earth and Space Science Grade 2: book set by Teacher Created Material

Weathering and Erosion, Water Bodies, Rocks and Minerals, Water Cycle, Landforms

U.S. Landforms by Scholastic

Landforms by William B. Rice

Introducing Landforms by Bobbie Kalman

Looking at Landforms (Little World Geography) by Ellen K. Mitten

Earth's Landforms and Bodies of Water (Earth's Process Close-Up) by Natalie Hyde

EXPLORE

Where Did the Rock Go? This unit is being used with permission from Jessica Boschen & Jill Elliott

Explore Erosion Center (Boschen & Elliott, *History of Earth Slow and Fast Changes*)

Use your device and scan the QR Code or enter the web address below. Listen to the audio while you follow along and read the text.

https://goo.gl/vnevyN

Here is the text. In the unit there are great pictures to go with this passage.

Where Did the Rocks Go?

Erosion is the weathering away of rocks and soil. Water, wind, and ice cause most erosion on Earth. Rocks seem like they can't be changed. Even small drops of water can make big changes. It takes a very long time. But it happens all over the world.

A river flows along the soil and rock. It wears away the soil and rock. It takes tiny pieces, bit by bit. Over many years, the river causes much erosion. It forms a canyon.

Rain can cause soil erosion. Rain water moves down a hill. As it moves, it carries things with it. Small pieces of soil move in the water. More and more soil moves away. Soon, a gully is made. Now the land is hard to use. Farmers cannot drive tractors on it. Cows and horses can fall.

Ocean waves bash against cliffs. The ocean water takes away pieces of rock. Over time, the ocean cliff changes. Erosion takes away its flat shape. It now has many different shapes. Erosion can make caves along the ocean shore.

Wind erodes rocks, too. This happens in dry places, like deserts. Wind blows against rocks. It takes away pieces of the rock. It turns rocks into beautiful shapes. Arches and bridges are formed. Caves and tunnels are carved out.

Wind erosion moves sand around. It piles it into dunes. It also moves these dunes. Their shapes change from one year to the next.

Rocks are eroded by ice. Ice in glaciers make huge valleys. In some places, snow does not melt in the summer. After many years, the layers of snow make a glacier. Glaciers are heavy. They slip down the mountain. As they move, they scrape away the rock. This is glacier erosion. They make U-shaped valleys.

Ice can erode rocks in other ways. Rain water gets onto rocks cracks. It freezes at night. Frozen water takes up more space. This makes the crack bigger. When this happens, the rock breaks. This is called ice wedging. Ice wedging turn rocks into amazing shapes called hoodoos.

Water, wind, and ice are all forces of nature. They change rocks, soil, and sand in many ways. The landforms they make gives our Earth beautiful places for us to enjoy.

Task Cards: Set 1

#1 What is erosion?

#2 How do rivers make erosion happen?

#3 How do oceans make erosion happen?

#4 What is a way that wind erodes rocks?

#5 How do glaciers make erosion happen?

#6 These pictures are examples of what kind of erosion?

Task Cards: Set 2

#1 What is true about erosion?

a. It is always fast.

b. It is always slow.

c. It is the wearing a way of rocks.

d. Soil erosion does not happen.

#2 How do rivers make erosion happen?

a. They blow against rocks and make arches and bridges.

b. They bash against cliffs and wear away the flat shapes.

c. They wear away soil and rock and form canyons.

d. As they move down the mountain, they make a U-shaped valley.

#3 How do oceans make erosion happen?

a. They blow against rocks and make arches and bridges.

b. They bash against cliffs and wear away the flat shapes.

c. They wear away soil and rock and form canyons.

d. As they move down the mountain, they make a U-shape.

#4 What is a way that wind erodes rocks?

a. It blows against rocks and makes arches and bridges.

b. It bashes against cliffs and wears away the flat shapes.

c. They wear away soil and rock and form canyons.

d. As they move down the mountain, they make a U-shape.

#5 How do glaciers make erosion happen?

a. It blows against rocks and makes arches and bridges.

b. They bash against cliffs and wear away the flat shapes.

c. They wear away soil and rock and form canyons.

d. As they move down the mountain, they make a U-shape.

#6 These pictures are examples of what kind of erosion?

Now it is your turn to explore erosion.

Build it:

1. Stack your sugar cubes.
2. Make the stacks right next to each other.
3. Place the stacks right next to each other.
4. This is your rock formation.
5. Draw this in your Activity Sheet.

Erode It:

6. Fill up your dropper with water.
7. Drip it onto your rock formation.
8. Drip it one drop at a time.
9. Refill your dropper _____ times.
10. Drip it one drop at a time.
11. Draw your rock formation in your Activity Sheet.

Activity Sheet or Science Journal

Build It

Draw your rock formation.

Erode It

Draw your rock formation

Describe the changes that happened after erosion.

What force of nature caused the erosion in this activity?

Some buildings are made from rocks that erode easily. These rocks are often beautiful. People want to protect these buildings from erosion. How can they protect the rocks from erosion?

Explore, Earthquakes Center (Boschen & Elliott, *History of Earth Slow and Fast Changes*)

This unit is being used with permission from Jessica Boschen & Jill Elliott

Watch a video

Use your device to watch Earthquakes.

http://bit.ly/Earthquakes5

After watching the video, complete task cards in your journal.

Task Cards: Set 1

#1 What happens during an earthquake?

#2 What are the Earth's plates?

#3 What are the edges of the plates like?

#4 What is a fault?

#5 What happens when plates get stuck?

Task Cards: Set 2

#1 What happens during an earthquake?

a. The crust stops moving.

b. The plates get stuck.

c. The ground shakes.

d. Rocks are made.

#2 What is crust?

a. The solid ball of Earth.

b. The outside layer of the Earth.

c. The middle of the Earth.

d. The sky over the Earth.

#3 What is true about the Earth's plates?

a. Pieces of the crust.

b. Fit together like puzzle pieces.

c. Both a and b

d. Neither a nor b.

#4 What are the edges of the plates like?

a. Bumpy

b. Smooth

c. Straight

d. Clean

What is a fault?

a. The center of the Earth

b. Where the clouds make rain.

c. Where earthquakes never happen.

d. Where the plates touch.

Explore: Slow or Fast (Boschen & Elliott, *History of Earth Slow and Fast Changes*)

This unit is being used with permission from Jessica Boschen & Jill Elliott

Use your device and scan the QR code or enter the web address below. Listen to the audio while you follow along and read the text

https://goo.gl/STJmCg

This is the transcript.

The crust is broken up into plates. These plates float on the mantle. The mantle makes the plates move.

The plate boundary is where two plates meet.

As the plates move, they rub against each other. They sometimes get stuck. Finally, they get unstuck. Then they let go. This happens with a big jolt. The Earth shakes with an earthquake. Rocks break as the plates move. A fault forms where the rocks break.

The moving plates also make volcanoes. Deep inside the crust, it is very hot. The heat melts the rock in the crust. Melted rock under the Earth's surface is called magma. It forms a pool of magma in the magma chamber. It rises to the top. Eventually, it erupts. When magma comes out of the volcano, it is called lava.

Earthquakes and volcanoes make changes on Earth. Erosion also makes changes on Earth. The changes may be fast or slow. Fast changes can happen within a few days or a few months. Slow changes take many years to happen.

Task card set 1

#1 What are the two main ways the Earth is changed?

#2 What are the layers of Earth?

#3 What is an earthquake?

#4 How does a fault form?

#5 What is an eruption?

Task card set 2

The Changing Earth

#1 What are the ways the Earth is changed?

a. Erosion

b. Plate tectonics

c. Both a and b

d. Neither a nor b

#2 What are the layers of Earth?

a. Inner core, outer core, mantle, and crust

b. Inner core, outer core, mantle, and magma

c. Magma, inner core, outer core, and crust

d. Magma, lava, plates and tectonic

#3 What is an earthquake?

a. Movement of the Earth's core

b. Wearing away of rocks and soil

c. Sudden shaking of the Earth

d. When lava comes out of the volcano

#4 How does a fault form?

a. When a volcano erupts

b. When the rocks break as the plates move

c. When magma builds up deep in the Earth

very hot. It is partly melted rock and is bendy like tar. This layer is always moving. They top layer of Earth is the crust. This is the layer that we live on. It includes the ground and the bottom of the ocean.

The crust is made of many pieces. These pieces are called plates. They fit together like pieces in a puzzle.

In the picture, you can see the plates. Most of the continents sit on plates. Some plates have only ocean on them. The plate boundary is where two plates come together.

The plates float on the mantle. Since the mantle is always moving, the plates Since the mantle is always moving, the plates are always moving. The plates do not always move in the same way.

Some plates move past each other.

As they move, they rub on each other. The plates have rough edges. They get stuck as they move past each other. They keep trying to move. Pressure builds up. Over time, there is a lot of pressure between them. They finally get unstuck. When this happens, they move with a big, fast shake. This shaking of Earth is called an earthquake.

Plates move as the mantle moves. This is called plate tectonics. The moving plates make many things happen. Earthquakes happen. Volcanoes are made. Mountains are built up. Deep canyons open up. The Earth is always changing.

Task cards set 1

#1 What are the Layers?

#2 What are the plates?

#3 Why do plates move?

d. All of the above

#5 What is an eruption?

a. Movement of the Earth's core

b. Wearing away of rocks and soil

c. Sudden shaking of the Earth

d. When lava comes out of a volcano

Activity sheet will have pictures of slow and fast changes to the Earth. Students will need to sort and paste on activity sheet.

Explore Moving Plates: Center (Boschen & Elliott, *History of Earth Slow and Fast Changes*)

This unit is being used with permission from Jessica Boschen & Jill Elliott

Use your device and scan the QR Code or enter the web address below. Listen to the audio while you follow along and read the text.

https://goo.gl/7MTjri

Transcript of reading.

Moving Plates

Think about the ground you are standing on. Does it seem firm? Or does it feel like it is moving? Whether you feel it or not, the ground is always moving.

The Earth is not a solid ball. It has four layers, one around the other.

In the center of the Earth is the inner core. Around the inner core is the outer core. These layers are very hot. They are made of metal. The next layer is made of rock. It is called the mantle. It is

#4 What is an earthquake?

#5 What things happen because of plates tectonics?

Task card set 2

#1 Which of these is not a layer of Earth?

a. Core

b. Mantle

c. Crust

d. Magma

#2 What are the plates?

a. Pieces of Earth's crust that fits together like pieces in a puzzle

b. Place deep in the Earth where the magma

c. The part of the Earth that makes the crust float

d. The part of the Earth around the core

#3 Why do the plates move?

a. The moving ocean wave move them.

b. Because the mantle always moves

c. Because they float on the core.

d. The wind blow blows them around.

#4 What is an earthquake?

a. The movement of the mantle on the crust

b. The shaking of the Earth's core

c. The sudden shaking of the Earth

d. The building up of magma in the Earth

#5 What things happen because of plate tectonics?

a. Volcanoes

b. Mountains

c. Canyons

d. All of the above

Activities

Play a Video Game: Shape it up

Use your computer to play the video game at the following site

http://sciencenetlinks.com/interactives/shapeitup.html

Click "How to Play" Read instruction. Then Click "Start"

Task cards set 1

#1 How did the tall rock change to a small one?

#2 How did the valley form in the mountain?

#3 What force of nature made the valley in the desert?

#4 What force of nature made the island in the ocean?

Task cards set 2

#1 How did the tall rock change to a small one?

a. Wind

b. Water

c. Glacier

d. Volcano

#2 How did the valley form in the mountain?

a. Wind

b. Water

c. Glacier

d. Volcano

#3 What force of nature made the valley in the desert?

a. Wind

b. Water

c. Glacier

d. Volcano

#4 What force of nature made the island in the ocean?

a. Wind

b. Water

c. Glacier

d. Volcano

Activity 2

Play a video Game

Use your computer to play the video game at the following web address:

http://www.scholastic.com/magicschoolbus/games/volcano/index.htm

Task card set 1

#1 What are the inner core and outer core made of?

#2 What is the mantle made of?

#3 What layer of the Earth has volcanoes?

#4 What is magma called when it leaves the volcano?

Task card set 2

#1 What layer comes after the inner core?

a. Crust

b. Mantle

c. Outer core

d. Magma chamber

#2 What are the inner core and the outer core made of?

a. Rock

b. Metal

c. Water

d. Volcano

#3 What is the mantle made of?

a. Rock

b. Metal

c. Water

d. Volcano

#4 What layer of the Earth has volcanoes>

a. Crust

b. Mantle

c. Outer core

d. Magma chamber

#5 What is magma called when it leaves the volcano?

a. Magma chamber

b. Mantle

c. Crust

d. Lava

Explore Shaking and Quaking Center (Boschen & Elliott, *History of Earth Slow and Fast Changes*)

This unit is being used with permission from Jessica Boschen & Jill Elliott

Use your device and scan the QR code or enter the web address below. Listen to the audio while you follow along and read the text. (You can make a QR code with a QR reader)

https://goo.gl/v9ACCnm

This is a transcript.

Shaking and Quaking

Have you ever felt an earthquake? You can feel the ground rumble and roll under your feet. What happens during an earthquake? To find out, we need to know what goes on deep inside the Earth.

The Earth is made of layers. The center of the Earth is the inner core. Around the inner core is the outer core. These layers are very hot. They are made of metal. Around the outer core is the mantel. The mantle is very hot. It is made of rock. This rock is partly melted. It moves like thick honey. The outside layer is the crust. The crust is made of rock. It covers the Earth, including the part under the ocean.

The crust is not one solid piece. It is made of many pieces. They fit together like a puzzle. These pieces are called plates. This is a map of the world.

The light lines show the continents. You can see North and South America in the center of the map. The dark lines show where the plates are. The dark lines are the plate boundaries. This is where two plates come together.

Plates are always moving on the mantle. Not all plates move the same way. Their edges are bumpy. When they move, the bumpy edges can get stuck. But the plates still try to more. This builds pressure at the plate boundary. After some time, the plates will finally move. The bumpy rough edges move past each other. This can happen with a big jolt. It causes a sudden shaking of the Earth. This is an earthquake.

As plates move, the rocks in the crust break. This makes a fault. The San Andreas Fault is 750 miles long. It runs almost the whole length of California.

Activity:

You will now investigate earthquakes. **(Engineering design)**

Build It:

1. The brown paper is the ground.
2. Use only blocks to build a building on top of the paper.

   It should be about 12 inches high. Use the ruler to measure your building.
3. Draw your building on your Activity Sheet.

Use complete sentences to explain how it is built.

Shake It (Part 1)

4. Place your hand on the paper. One hand should be on each side of the building.
5. Gently move the paper back and forth.
6. What happened?

Draw this on your Activity Sheet. Use complete sentences to explain what happened.

Make It Stronger

1. Now it is time to make your building stronger.

   Use other things to help your building stay standing during an earthquake.

2. Draw this on your Activity Sheet. Use complete sentences to explain what you used to make your building stronger.

Shake It (Part 2)

3. Place your hands on the paper. One hand should be on each side of the building.
4. Gently move the paper back and forth.
5. What happened?

Draw this on your Activity Sheet. Use complete sentences to explain what happened.

Build It	**Shake It (Part 1)**	**Make It stronger**	**Shake It (Part2)**
Draw your building	Draw your building	Draw your building	Draw your building

The Changing Earth

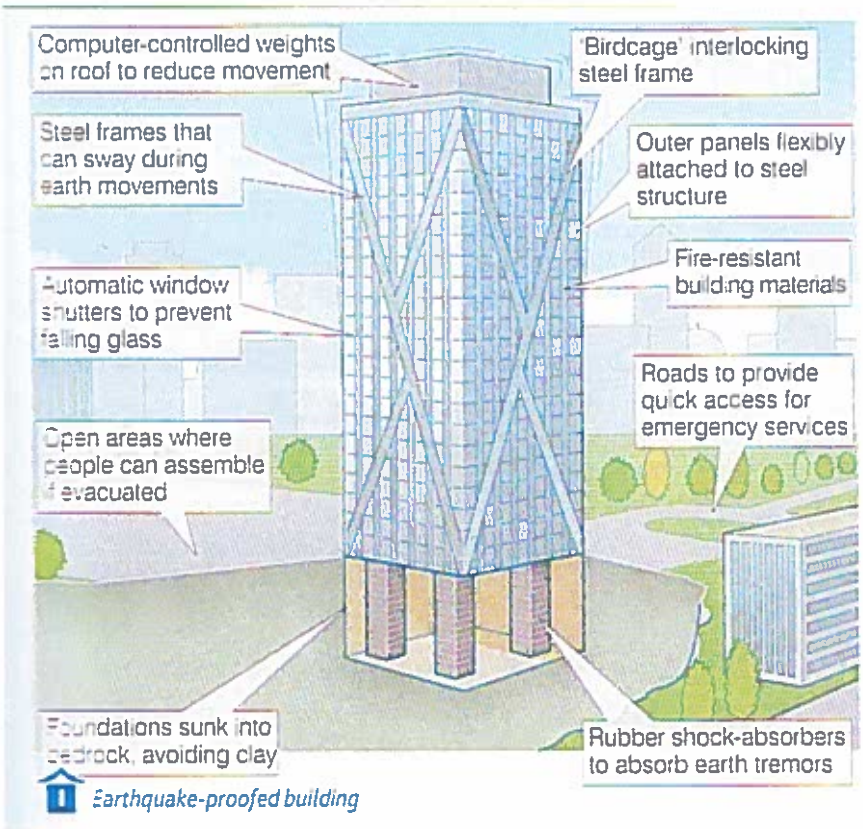
Describe how you built it.	Describe how you built it	Describe how you built it	Describe how you built it

What changes did you make to you building?

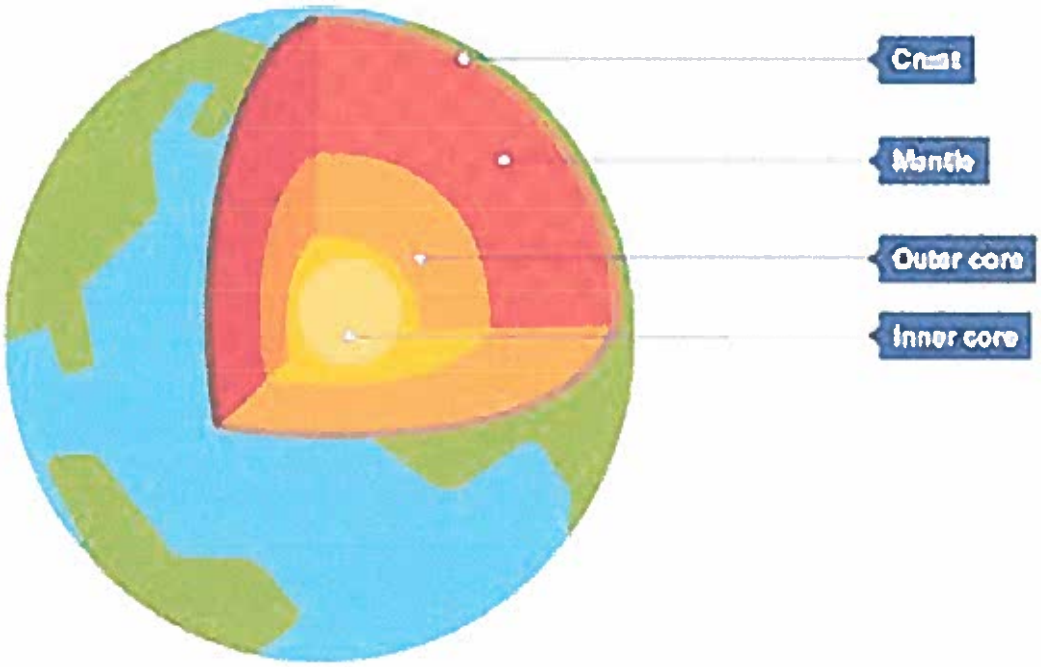
Did this help to make it stronger?

Why or why not?

What other things could help a building in an earthquake? Why?



Earthquake-proofed building



1. The _____ is the layer around the outer core. It is made of hot, partly melted rock.
2. The _____ are the pieces of the crust that fit together like a puzzle.
3. A plate _____ is the place where two plates come together.
4. An _____ is the sudden shaking of the Earth.
5. A _____ is where the rocks in the crust breaks as the plates move.

Words to Use: plates, mantle, fault, boundary, earthquake

Explore: I Lava Volcanoes! Center (higher reading level) (Boschen & Elliott, *History of Earth Slow and Fast Changes*)

This unit is being used with permission from Jessica Boschen & Jill Elliott

This station is a challenge station.

Use your device to enter the web address below. Listen to the audio while following along and read the text

Here is the transcript.

Deep inside the Earth, there is melted rock. Melted rock underground is called magma. It sits in a pool called the magma chamber. Magma slowly moves up. It rises through a tube. The tube is called a vent.

Soon it reaches the top. It is at the Earth's surface. Magma that is on the top of the Earth is called lava. The lava comes out of a volcano. This is called an eruption. Lava leaves the volcano from the crater. This is the hole at the top of the volcano.

The air cools the lava. The lava becomes hard rock. More lava comes out. It makes a second layer of hard rock. Many layers of rocks build up. Over time, it makes a mountain. It gets bigger and bigger as each layer hardens to rock.

Some volcanoes form quickly. They can grow tall in a few months. Others take thousands of years to grow tall. Volcanoes grow in different ways.

There are three shapes of volcanoes. The first type is the shield volcano. Shield volcanoes are flat and rounded. They look like upside down bowls. The lava is thin and runny. It flows easily down the side.

The Changing Earth

This is a picture of shield volcanoes. They are in Hawaii. In the front is Kilauea. In the back is Mauna Loa is the world's biggest volcano.

The second type of volcano is the stratovolcano.

Stratovolcanoes are tall and thin. They look like steep cones. This makes pressure build up in the volcano. These volcanoes have huge eruptions.

Examples of stratovolcanoes are Mount Hood in Oregon and Mount St Helens in Washington.

The third type of volcano is the cinder cone volcanoes.

Cinder cone volcanoes make cone shapes. Lava and rocks shoot up in the air. They fall back down onto the tops. They do not get very tall.

An example of a cinder cone volcano is Kronotsky in Russia.

Task card set 1

#1 What is the magma chamber?

#2 What is the difference between magma and lava?

#3 How do volcanoes build tall mountains?

#4 What is a shield volcano?

#5 What is a cinder cone volcano?

Task card set 2

#1 What is the magma chamber?

The Changing Earth

a. Hole at the top of the volcano

b. Pool of magma deep inside the Earth

c. Place where most of the lava is found

d. Tube inside the volcano. Magma flows through it

#2 What is magma?

a. Melted rock found in the core layer

b. Melted rock found on the crust layer

c. Melted rock found under the ground

d. Melted rock found above the ground

#3 How do volcanoes build tall mountains?

a. Many layers of lava build up

b. All volcanoes start out very big

c. The crater adds layers of mantle

d. The magma chamber gets bigger

#4 What is true about a shield volcano?

a. Tall and thin

b. Flat and rounded

c. Thick lava with huge eruptions

d. Rocks and lava shoot up and fall back down

#5 What is a cinder cone volcano?

a. Tall and thin

b. Flat and rounded

c. Thick lava with huge eruptions

d. Rocks and lava shoot up and fall back down

An additional activity for students for finding evidence in text,

Give students a copy of text, a highlighter, and task cards. Students will read the text and when they come to the answer in text, have them highlight the answer in the passage.

Explore: Changes in the Park: (Boschen & Elliott, *History of Earth Slow and Fast Changes*)

This unit is being used with permission from Jessica Boschen & Jill Elliott

Read: Changes in the Parks

Transcript:

Ocean waves wear away rocks. Acadia National Park is in Maine. The cliffs here have interesting shapes. These shapes were made by the waves hitting them. The water eroded the rocks.

Rain can wear away soil quickly. It washed soil into rivers. As the river moves, it drops the soil. This puts curves into the river. We see this in the Denali River in Denali National Park in Alaska Rain washes soil down the hills. The soil goes into the river. It gets dropped on the side of the river. Now the river has bends and curves.

Wind Erosion

Wind wears away rocks slowly. This happens mostly in dry places. We see wind erosion in Arches National Park in Utah. Wind moves along the rocks. As it moves, it breaks off grains of rocks. It carries these away. This is what made the arches in the National Park.

Wind erosion can happen quickly. Death Valley National Park is in California. There are many sand dunes in this park. Wind blows through Death Valley. It causes erosion of the sand dunes. This causes the dunes to change shape. It also moves the dunes.

Ice Erosion

Glaciers are very heavy. They slip down mountains. As they move, they scape the rocks. This is erosion. Glacier erosion makes U-shaped valleys. We can see this in Glacier National Park in Montana. There is no more glacier in this part of the park. But we can see the valley. It is shaped like a U. This tells us that there was once a glacier here.

Ice erosion can happen quickly. This happens with ice wedging. Water gets in cracks of rocks. It freezes overnight. Ice is bigger than water. When water turns to ice, it gets bigger. This forces the rock to crack open. It breaks pieces off the rock. This is what happened in Zion National Park in Utah. The tall, thin rocks were made by ice wedging.

Task card set 1

#1 What is erosion?

#2 What are the ways that water erosion happens?

#3 What is a slow way wind erosion happens?

#4 How do glaciers erode rocks?

#5 What is a fast way ice erosion happens?

Task card set 2

#1 What is true about erosion?

a. It always happens fast.

b. It always happens slowly.

c. It does not change rocks.

d. It is the wearing away of the Earth.

#2 How does water erosion happen?

a. Rain

b. River

c. Ocean

d. All of the above

#3 Which of these is a slow way that erosion happens?

a. When sand dune are moved in the desert

b. When wind blows along rocks, breaking off grains

c. When ice wedges apart rocks and breaks off pieces

d. When rain storms cause soil to run off into rivers

#4 How do glaciers erode rocks?

a. As they move down mountains, they scrape rocks and make a U-shaped valley.

b. They melt into rivers, carry soil. This puts bends in the rivers

c. Ice gets into rock cracks and breaks off pieces of the rock.

d. They cause sand dunes to move to a new place.

#5 What is a fast way ice erosion happens?

a. As they move down mountains, they scrape rocks and make a U-shaped valley.

b. They melt into rivers, carrying soil. This puts bends in the river.

c. Ice gets into rock cracks and breaks off pieces of the rock.

d. They cause sand dunes to move to a new place.

Explain:

Explain to student that changes are made to the Earth. Sometimes they are slow and sometimes fast.

Explain to students that they will take a closer look at two different types of land changes. One will change the land slow and the other fast.

Show the students a video of a volcano eruption.

"Geography Lesson: What is a Volcano?"-Twig World

http://www.youtube.com/watch?v=WgktM2luLok

Ask students:

What type of land change was that?

Would it happen fast or slow?

Show students a video of weathering/erosion.

"Weathering and Erosion"- Crash Course Kids:

http://www.youtube.com/watch?v=v=Rlak3Wvh9c

Ask students:

The Changing Earth

What type of land change was that?

Would it happen fast or slow?

Objective: Help students develop the mindset that while both these events change the structure of the Earth, they change it in different ways.

As The Earth Changes. (n.d.). Retrieved from http://www.cpalms.org/

Instruction/Teacher Modeling (Russell, 2018) Landforms

(25 minutes)

- Display pictures of landforms, and label them on the board.
- Remind your students that **mountains** are the highest landform on Earth's surface, and they may be steep and covered with snow or have gentle slopes with a rounded top. Explain that a group of mountains is called a **mountain range.**
- Show your students a picture of **hills** and explain that these are areas of raised land.
- Tell your students that **plateaus** are areas of high land that often have steep sides but are typically flat or hilly on top.
- Display an example of **plains**, informing them that these are large areas of flat land.

Remind your students that **valleys** are low areas that lie between two mountains or hills, and they are often formed by rivers or glaciers. (Russell, 2018)

- Additional vocabulary words are listed below (Boschen & Elliott, *History of Earth Slow and Fast Changes*)

Inner core: inner layer of the Earth

Outer core: layer of the Earth that is around the inner core

Mantle: middle layer of Earth

Crust: outer layer of Earth

Plates: pieces of the Earth's crust; float on the mantle

The Changing Earth

Fault: where the rocks break along the plate boundary

Plate boundary: where two plates come together

Plate tectonics: the movement of plates on the mantle

Earthquake: sudden shaking of the Earth

Erosion: the moving away of the soil or rocks by water, wind, and ice Cinder cone volcano: volcano with a cone that does not get very tall

Eruption: when lava comes out of a volcano

Crater: hole at the top of the volcano

Lava: melted rock above the Earth's surface

Magma: melted rock under the Earth's surface

Magma chamber: pool of magma deep underground

Stratovolcano: volcano with a tall, steep cone with thick lava

Vent: tube inside the volcano through which magma rises

Give students a set of vocabulary words and definitions to add to their science journals. When words have been added to their science journals, I allow student to use journals for spelling. At least that is where they can look for spelling for their writing activities.

Elaborate: Data and Research project

One Geology Kid (*1G Kids*)

http://www.onegeology.org/extra/kids/home.html

The site provides maps and information of geological data such as minerals, volcano, earthquake, and Earth processes. Students can use information and observation to connect with previous knowledge.

I would address both Math and Language Arts objectives in my research project.

- Draw a picture graph and a bar graph (with single unit scale) a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (CCSS.MathCONTENT2.MD.D.10)
- Participate in shared research and writing projects (e.g. read a number of books on a single topic to produce a report; record science observation. (CCSS.ELA-Literacy.W2.7)

Student will explore and use information to extend their knowledge on their research topic. This activity will extend in the next activity with landform and changes.

Students will click on different characters to investigate earthquakes, volcanoes, and Earth's process. They will use this data to use in their presentation and diagram or model.

Evaluate: Activity/Assessment for Landforms and Change

Making Playdough: https://www.doterra.com/US/en/blog/diy-aromatherapy-playdough

This activity is a great way for children to learn about aromatherapy and essential oils. Use a variety of oils and colors to help kids learn new scents. Some fun essential oils could

include: Wild Orange, Peppermint, Lemon, Rosemary, or Lavender. (*DIY: Aromatherapy Play Dough | dōTERRA Essential Oils* 2018)

Ingredients

2 cups flour
2 cups colored water
1 cup salt
1 tablespoon olive oil
1 teaspoon cream of tartar
5 drops essential oils

Instructions

1. Combine all ingredients, except for essential oils, in a large saucepan and stir until combined.
2. Once combined, put over medium heat. Using a spatula, continue to stir ingredients together until it forms a ball.

   Note: Don't overcook as it will lead to dry play dough.

3. Remove from heat and cool on parchment paper.
4. Once cool, add five drops of your favorite essential oil and knead until thoroughly combined.
5. You're done! Just store in an airtight container in the refrigerator for months of fun.

Give a set of landform cards

Island, mountains, canyon, desert, lake, ocean, river, valley, volcanos

Each small group of students will make a model. Students will present their model in small groups. This may be recorded on See Saw and shared with parents.

Students are scored both on presentation and listening participation.

Extension Projects

These pictures where used from Kristen Smith's lesson on landforms. (Smith)

Pace out picture for writing prompt. Have students write a story that uses the landform as their setting.

References

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