

Project Based Learning Unit: Earth Changes

Second Grade Rate your Mates

Big Idea: How does Earth change?

Big Idea Day 1: What are natural disasters and Earth events?

Big Idea Day 2: What is erosion?

Big Idea Day 3: Why is there sand at the beach?

Next Generation Science Standards:

2-ESS1-1, use information from several sources to provide evidence that Earth events can occur quickly or slowly. (Erosion, Tornados, Hurricanes, Why sand at the beach)

ESS2-2, Develop a model to represent the shapes and kinds of land and bodies of water in an area. (Rock sizes along a river from the mountain to the ocean)

Social Studies Standard:

2.5, Students understand the importance of individual action and character and explain how heroes from long ago and the recent past have made a difference in others' lives. (Firefighters, Heroes, Safety) Yes!

Math Standard:

CCSS.MATH.CONTENT.2.MD.A.1, Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes. (Measure rocks)

Visual Art:

Visual Art.2.3, Depict the illusion of depth in a work of art, using overlapping shapes, relative size, and placement within the picture. (Draw piles of rocks)

ELA Common Core State Standard:

RI.2.1 Ask and answer such questions as *who*, *what*, *where*, *when*, *why*, and *how* to demonstrate understanding of key details in a text.



Voice Levels Poster always posted by the whiteboard

Day 1

Objective

We will be able to explain what natural disasters are including examples. We will also be able to explain what Earth events are.

Big Idea

What are natural disasters?

Setting the Stage

Students need to understand the vocabulary of quickly versus slowly. It is important that students have the opportunity to use their background knowledge and exploration to investigate what natural disasters and Earth events are. If students gain a clear understanding of Earth events and the vocabulary, they can better understand Earth changes. In this lesson, students learn that natural disasters happen quickly.

Next Generation Science Standards

The lesson focuses on 2-ESS1-1, use information from several sources to provide evidence that Earth events can occur quickly or slowly. The students need to understand some Earth events happen slowly over time, while some happen quickly. Yes They will be learning about Earth events happening quickly today.

Science and Engineering Practices in the Next Generation Science Standards

This lesson address SP 8: obtain, evaluate, and communicate information. During the investigation, students will be obtaining information and evaluating the information through their observations and peers' background knowledge. They will communicate their information orally

by stating Earth events that happen quickly or slowly. They will write a sentence stating what natural disasters are and what Earth events are.

Materials:

Text about tornadoes per student (CCSS: Unit 8)

Text about hurricanes per student (CCSS: Unit 8)

Text about natural disasters per student

Individual white boards per student

Participation Checklist per student

Assessment Checklist per student

Roles:

Materials Manager

Checker

Recorder

Observer

THE 5-E FRAMEWORK

ENGAGE

CHECKER

5 MINUTES

Materials Manager gets the KWL charts for each person in their group and collects them to turn them in.

Lead your team in filling out the Know and Wonder part of the KWL chart about natural disasters or Earth events. Turn in the KWL chart and then discuss background knowledge on the topic.

Commented [BSF1]: Good use of this organizer

EXPLORE

10 MINUTES

Developing Questions

Lead your fellow students in understanding that they will investigate: "What a natural disaster is and what Earth events are?" Students collaborate in groups talking about what they know and possible answers to the big idea question.

RECORDER- Record: Observe and ask questions- *What questions, ideas, and background knowledge do they have?* (Recorder records on a blank piece of paper.)

5 MINUTES: Timed so students can stay focused on completing the task.

EXPLAIN
10 MINUTES

ALL

All students get the opportunity to read, students in groups will take turn reading the texts.

Observer makes sure every student has the opportunity to read. The group stops after reading each text and discusses what they have read so far and learned from the text.

Commented [BSF2]: Will the observer also be scanning for cooperative behaviors?

EVALUATE
10 MINUTES

Draw conclusions. Communicate results.- Ask the students what they noticed happened to the Earth when a hurricane hit or a tornado occurred. Have the group think about whether these Earth events happen quickly or slowly.

Each group is then given an opportunity to share their ideas with the class by agreeing or disagreeing with the first group who shared their ideas. Review what Earth events happen quickly and what happens slowly. (Students will use individual whiteboards to show their responses.)

They will then write a sentence about natural disasters and Earth events. They will then write a sentence stating whether these Earth events happen quickly or slowly. Provide students with a sentence frame (English Learner support): "This Earth event happened ____." "Examples of natural disasters are ____ and ____."

Assessment Checklist:

___ Student wrote one natural disaster in their sentence frame.

___ Student wrote a second natural disaster in their sentence frame.

___ Student wrote that these Earth events happen quickly.

Total: /3

Participation Checklist:

___ I shared an idea with my group.

___ I followed my role's requirements.

___ I respected everyone's ideas.

___ I was a positive team member (polite, helpful, focused).

Total: /4

Note: Each student will be provided with a copy of the participation checklist at the beginning of the lesson.

Day 2

Objective

We will be able to explain erosion.

Big Idea

What is erosion?

Setting the Stage

Students need to understand the vocabulary of quickly versus slowly. They will also need to understand what Earth events are. It is important that students have the opportunity to use their background knowledge and exploration to investigate what erosion means. If students gain a clear understanding of Earth events and the vocabulary, they can better understand Earth changes. In this lesson, students learn that erosion changes Earth slowly.

Next Generation Science Standards

The lesson focuses on 2-ESS1-1, use information from several sources to provide evidence that Earth events can occur quickly or slowly. The students need to understand some Earth events happen slowly over time, while some happen quickly. They have read about Earth events that happen quickly already.

Science and Engineering Practices in the Next Generation Science Standards

This lesson address SP 8: obtain, evaluate, and communicate information. During the

investigation, students will be obtaining information and evaluating the information through their observations and peers' background knowledge. They will communicate their information orally by stating Earth events that happen quickly or slowly. They will write a sentence stating what erosion is.

Background Knowledge

Students have already learned about tornados, earthquakes, and hurricanes. They know that these Earth events happen quickly as people have to be prepared for them to happen at any moment. Students will collaborate in groups to obtain, evaluate, and communicate information.

Materials:

Time-lapse video of erosion occurring

Individual white boards per student

Participation Checklist per student

Assessment Checklist per student

Roles:

Materials Manager

Checker

Recorder

Observer

THE 5-E FRAMEWORK

ENGAGE

CHECKER

5 MINUTES

Lead your team in recalling what Earth events they already know about (earthquakes, tornados, and hurricanes). Ask them if these Earth events happened slowly or quickly (quickly).

EXPLORE

10 MINUTES

Developing Questions

Lead your fellow students in understanding that they will learn what erosion is and whether it happens quickly or slowly. What is erosion? Does it change Earth? How? Does it change Earth quickly?

RECORDER- Record: Observe and ask questions- *What questions, ideas, and background knowledge do they have?* (Recorder records on a blank piece of paper.)

5 MINUTES: Timed so students can stay focused on completing the task.

EXPLAIN

ALL

10 MINUTES

Material manager passes out the assessment and participation checklist to each group member.

Observer makes sure the group is listening during the time-lapse video or one type of erosion. The group then discusses what happened in the video and how long the process took from start to finish in real time. **Observer** makes sure each group member has an opportunity to share their ideas.

Commented [BSF3]: Will you have a checklist or rubric to assist your observers in this task?

EVALUATE

10 MINUTES

Draw conclusions. Communicate results - Ask the students what they noticed happened to Earth when watching the time-lapse video on erosion. Ask students if they can define erosion.

Each group is then given an opportunity to share their ideas with the class by agreeing or disagreeing with the first group who shared their ideas. Review what Earth events happen quickly and what happens slowly. (Students will use individual whiteboards to show their responses.)

They will then write a sentence stating something about erosion. They will then write a sentence stating whether this Earth event happens quickly or slowly. Provide students with a sentence frame (English Learner support): "This Earth event happened ____." "Erosion ____."

Assessment Checklist:

Student wrote a correct sentence about erosion.

Student wrote that erosion happens slowly.

Total: /2

Participation Checklist:

I shared an idea with my group.

I followed my role's requirements.

I respected everyone's ideas.

I was a positive team member (polite, helpful, focused).

Total: /4

Note: Each student will be provided with a copy of the participation checklist at the beginning of the lesson.

Day 3

Objective

We will be able to explain why there is sand at the beach.

Big Idea

Why is there sand at the beach?

Setting the Stage

Students need to understand the vocabulary of quickly versus slowly. They will also need to understand what Earth events are. It is important that students have the opportunity to use their background knowledge and exploration to investigate how sand gets to the beach, while thinking about if it happens over time slowly or quickly. If students gain a clear understanding of Earth events and the vocabulary, they can better understand Earth changes. In this lesson, students learn that Earth changes when Earth events happen quickly or slowly.

Next Generation Science Standards

The lesson focuses on 2-ESS1-1, use information from several sources to provide evidence that Earth events can occur quickly or slowly and ESS2-2, Develop a model to represent the shapes and kinds of land and bodies of water in an area. The students need to understand some Earth

events happen slowly over time, while some happen quickly. They have read about Earth events that happen quickly already.

Science and Engineering Practices in the Next Generation Science Standards

This lesson address SP 8: obtain, evaluate, and communicate information. During the investigation, students will be obtaining information and evaluating the information through their observations and peers' background knowledge. They will communicate their information orally by stating Earth events that happen quickly or slowly. They will write a sentence stating if sand getting to the beach is a quick or slow Earth event on their assessment page.

Structure and Function

In this lesson, the students understand that sand at the beach comes from mountain rocks that have broken off the mountain and are being transported down a river where they are slowly broke up to pieces of sand. They will then understand that this process happens slowly and is considered an Earth event. This is important for students to know because they need to understand the ways Earth changes and that Earth events can happen quickly or slowly. This teaches them that change is not always quick to happen.

Background Knowledge

Students have already learned about tornados, earthquakes, and hurricanes. They know that these Earth events happen quickly as people have to be prepared for them to happen at any moment. Students will collaborate in groups to obtain, evaluate, and communicate information.

Materials:

Construction paper cut into rough large squares-about 3 sheets per group

River printout of 5 pages per group

River Assessment page per student

Individual white boards per student

Participation Checklist per student

Assessment Checklist per student

Roles:

Materials Manager

Checker

Recorder

Observer

The instructor begins this activity by assigning the materials manager, checker, recorder, and observer. The materials managers will be provided with the construction paper pieces, the river printout of 5 pages per group, and the participation checklist per student.

THE 5-E FRAMEWORK

ENGAGE

CHECKER

5 MINUTES

Lead your team in recalling what Earth events they already know about (earthquakes, tornados, and hurricanes). Ask them if these Earth events happened slowly or quickly (quickly).

EXPLORE

10 MINUTES

Developing Questions

Lead your fellow students in understanding that they will investigate: "Why is there sand at the beach?" Students collaborate in groups talking about what they know and possible answers to the big idea question.

RECORDER- Record: Observe and ask questions- *What questions, ideas, and background knowledge do they have?* (Recorder records on a blank piece of paper.)

5 MINUTES: Timed so students can stay focused on completing the task.

EXPLAIN

ALL

10 MINUTES

Material manager lays out the 5 river pages in the correct order (they are numbered, 1: mountain-5: beach). The construction paper roughly cut squares (large rocks) are placed on the first paper of the 5 page river (the mountain).

All students get ready to grab one rock at a time from the first river page and rip it once before placing it on the second river page. **Observer** counts to 10 when the group starts. The group stops when the observer reaches 10. Repeat the process by having the group start on the second page of the river and rip those rocks once one at a time and place them on the third river page. The observer has the group stop after 10 seconds. Repeat until the rocks reach page five of the river.

EVALUATE

10 MINUTES

Draw conclusions. Communicate results.- Ask the students what they noticed happened to the rocks when they went down the river from the mountain to the beach. Have the group think about whether this Earth event happens quickly or slowly.

Each group is then given an opportunity to share their ideas with the class by agreeing or disagreeing with the first group who shared their ideas. Review what Earth events happen quickly and what happens slowly. (Students will use individual whiteboards to show their responses.)

Then provide each student with the River Assessment where they will draw large rocks by the mountain, medium sized rocks towards the top of the river, small rocks further down the river, pebbles near the beach, and then sand on the beach at the very bottom of the river. They will then write a sentence stating whether this Earth events happen quickly or slowly. Provide students with a sentence frame (English Learner support): “This Earth event happened _____.”

Assessment Checklist:

- ___ Student drew large rocks at the very top of the river.
- ___ Student drew rocks decreasing in size toward the beach.
- ___ Student drew sand on the beach.
- ___ Student wrote that this Earth event happens slowly.

Total: /4

Participation Checklist:

- ___ I shared an idea with my group.

___ I followed my role's requirements.

___ I respected everyone's ideas.

___ I was a positive team member (polite, helpful, focused).

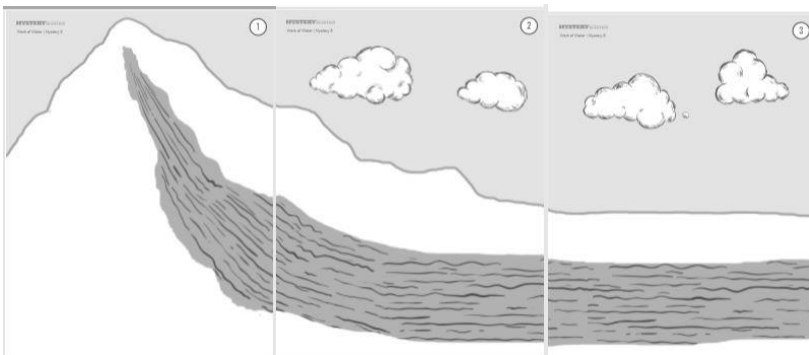
Total: /4

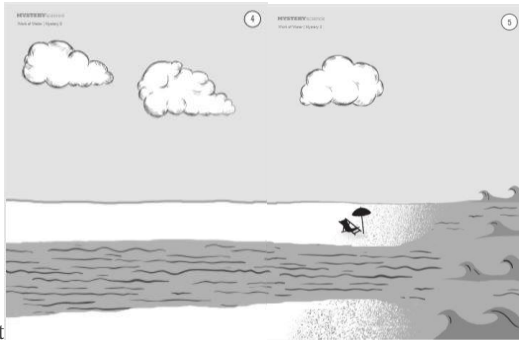
Note: Each student will be provided with a copy of the participation checklist at the beginning of the lesson.

Attachments



River Assessment:





River 5 page printout

