#3 Erosion/Natural Disasters HTWW (23-24)

Duration: 6 Weeks, 2 hours
Unit dates: 23rd Aug 2023 - 4th Oct 2023
Subjects: Language, Library Media, Social Studies, Science, English
Grades: 4

Planning

Transdisciplinary theme

How the world works

Transdisciplinary theme focus

- the interaction between the natural world (physical and biological) and human societies

Central idea

The role natural disasters play in shaping the Earth and how humans respond

Learner profile attributes

Inquirers, Knowledgeable

Key concepts

Responsibility, Causation, Connection

Related concepts

Concepts

- **Responsibility:** impact
- **Causation:** natural disasters
- **Connection:** changes

Lines of inquiry

- How natural disasters happen (natural disasters, causation)
- How humans can respond to natural disasters in order to reduce impact (prevention, function)
- How natural disasters and changes in the earth are connected (changes, connection)

Approaches to learning

Thinking Skills

Thinking Skills

Thinking Skills (General)

Teaching the ATL skills

Journeys SEL - Unit 5 - Responsible Decision Making

Learning goals and success criteria

Task: create a wordcloud to represent important concepts, ideas and vocabulary to inform others about an important aspect of your learning. Select key facts to illuminate the critical ideas your audience should know about this topic. **Criteria:** important aspect of the issue selected, wordcloud completed, words selected pertinent to the issue, relevant facts selected about the issue
4-ESS1-1 Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in landscapes over time.
4-ESS2-1 Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.(Biogeology)
4-ESS2-2 Analyze and Interpret data from maps to describe patterns of Earth's features.
4-ESS3-2 Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

- Demonstrates a change in thinking
- Use at least one fact

5-ESS3-1 Obtain and combine information about the ways individual communities use science ideas to protect the Earth’s resources and environment.

- can identify ways that communities are taking action to protect the Earth

5-ESS2-1 Develop a model using an example to describe the ways the geosphere, biosphere, hydrosphere and/or atmosphere interact.

- An explanation of how at least two systems interact with at least one detail that shows the connection between them (for example, how the things happening at the biosphere are affecting the atmosphere)

- Label the relevant systems/spheres

Subject standards

Social Studies

Geography

Geographic Representations and Spacial Views of the World

- GEO 4.2 - Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions and their environmental characteristics *(GEO 4.2)*
- GEO 4.1 - Construct maps and other graphic representations of both familiar and unfamiliar places. *(GEO 4.1)*

English

Reading: Informational Text

Craft and Structure

- CCSS.ELA-LITERACY.RI.4.4 - Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area. *(CCSS.ELA-LITERACY.RI.4.4)*

Integration of Knowledge and Ideas

- CCSS.ELA-LITERACY.RI.4.7 - Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears. *(CCSS.ELA-LITERACY.RI.4.7)*

Key Ideas and Details

- CCSS.ELA-LITERACY.RI.4.2 - Determine the main idea of a text and explain how it is supported by key details; summarize the text. *(CCSS.ELA-LITERACY.RI.4.2)*

Writing

Production and Distribution of Writing

- CCSS.ELA-LITERACY.W.4.6 - With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting. *(CCSS.ELA-LITERACY.W.4.6)*
- CCSS.ELA-LITERACY.W.4.4 - Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1-3 above.) *(CCSS.ELA-LITERACY.W.4.4)*
- CCSS.ELA-LITERACY.W.4.5 - With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing. (Editing for conventions should demonstrate command of Language standards 1-3 up to and including grade 4 here.) *(CCSS.ELA-LITERACY.W.4.5)*

Research to Build and Present Knowledge

- CCSS.ELA-LITERACY.W.4.7 - Conduct short research projects that build knowledge through investigation of different aspects of a topic. *(CCSS.ELA-LITERACY.W.4.7)*
- CCSS.ELA-LITERACY.W.4.8 - Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. *(CCSS.ELA-LITERACY.W.4.8)*

Text Types and Purposes

- CCSS.ELA-LITERACY.W.4.2 - Write informative/explanatory texts to examine a topic and convey ideas and information clearly. *(CCSS.ELA-LITERACY.W.4.2)*
- CCSS.ELA-LITERACY.W.4.2.A - Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension. *(CCSS.ELA-LITERACY.W.4.2.A)*
- CCSS.ELA-LITERACY.W.4.2.B - Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic. *(CCSS.ELA-LITERACY.W.4.2.B)*
- CCSS.ELA-LITERACY.W.4.2.C - Link ideas within categories of information using words and phrases (e.g., another, for example, also, because). *(CCSS.ELA-LITERACY.W.4.2.C)*
- CCSS.ELA-LITERACY.W.4.2.E - Provide a concluding statement or section related to the information or explanation presented. *(CCSS.ELA-LITERACY.W.4.2.E)*
- CCSS.ELA-LITERACY.W.4.2.D - Use precise language and domain-specific vocabulary to inform about or explain the topic. *(CCSS.ELA-LITERACY.W.4.2.D)*

Science

Engineering Design

Planning and Carrying Out Investigations

- 3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Earth and Human Activity

Constructing Explanations and Designing Solutions

- 4-ESS3-2 Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

Earth's Systems

Analyzing and Interpreting Data

- 4-ESS2-2 Analyze and Interpret data from maps to describe patterns of Eath's features.

Planning and Carrying Out Investigations

- 4-ESS2-1 Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

Earth's Place in the Universe

Constructing Explanations and Designing Solutions

- 4-ESS1-1 Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

Prior learning

In the provocation, students are asked to reflect on "what do you already know" as part of a KQH chart/gallery walk activity.

Connections: Transdisciplinary and past

This topic is purposeful and connects to local and global challenges because climate change is a world wide issue. Living on the coast, we are seeing powerful storms and students will be able to make connections between what we learn in the unit and the stregnth of the storms. Additionally, we have many students who are from, have family or are friends with students from Puerto Rico. Students in our school previously raised money for hurricane relief for Puerto Rico, and Bahamas so they are aware of the devastation of storms.
In 2nd grade students studied landforms and that there are fast and slow changes in the Earth.

Teacher questions

interconnectedness between human actions and earth changes
What is the relationship between climate and weather?
How different earth systemsinteracttogether?
Scientific solutions to address problems
How are human actions and earth changes connected?
What is and why is the greenhouse effect a problem?
Collective actions to protect the Earth Human response to the Earth's changes.
What can I do personally to help solve the greenhouse effect problem?
How can we work collaboratively to help reduce carbon emissions?
(local/state/federal/international)
How can human actions to protect the Earth?

Implementing

Learning experience library

HTWW Slideshow
Nora Greene

Google Earth Volatile Volcanoes & other resources
Amy Rios
What is it? How is it formed? Where does it form? SHOW MAP
https://earth.google.com/web/@-8.12164201,112.92534162,2974.87221446a,5693.82500491d,35y,0.70950867h,64.06355048t,0r/data=CjASLhIgNGFiYmQ4OWNiNDUwMTFlNzgwYzQ1ZmYzYTA0NDEwZDgiCmdjc19saXN0XzE - map
https://earth.google.com/web/@8.53508511,-2.91442364,-23163.5821626a,31750897.4603d,35y,0h,0t,0r/data=Ci4SLBIgZmU2MjU5Y2E0Y2FiMTFlODgxOGM3MTM3ODRlMDYzMjMiCGxheWVyc18w- Google Earth, 10,000 years of Volcanoes - map
https://www.usgs.gov/media/images/ring-fire- map
https://www.nationalgeographic.org/topics/resource-library-volcano/?q=&page=1&per_page=25- link to resources about volcanoes through natgeo
https://www.nationalgeographic.org/encyclopedia/ring-fire/- basic info with more links at the bottom - what is it

https://www.youtube.com/watch?v=cnKoTlUaqAs- What Are Volcanoes - Crash Course Geography (this one is long but may be worth watching) - what is it and how is it formed

Landforms, Hey! Crash Course Kids

Amy Rios

https://www.youtube.com/watch?v=FN6QX43QB4gCrash Course Kids

Weather vs. Climate Crash Course Kids

Amy Rios

https://www.youtube.com/watch?v=YbAWny7FV3wWeather vs. Climate

Map Reading of Natural Disasters

Amy Rios

https://www.ncei.noaa.gov/maps/hazards/

Week 5- Create To make meaning and reflect we will create by...

Amy Rios

Stop Diasters Game

Amy Rios

https://www.stopdisastersgame.org/stop_disasters/

Writing Connection

Amy Rios

What is it? How is it formed? Where does it form? What is the impact?

Provocation

Amy Rios

Erosion, weathering, landforms, natural disasters pictures - will be scanned into Google students will create a T Chart and create an I notice, I wonder

Week 6 -Evaluate To reflect on the unit (learning goals, content and process) and our growth we will...

Amy Rios

Week 3- Explore To explore concepts and ideas we will... Week 3 - Identify To pause, ponder and formulate inquiry questions we will...

Amy Rios

Developing 5 What is the Greenhouse Effect?

Amy Rios

1. (Optional)
Brief review of topics & vocab from prior lessons and essential questions -
What is Climate?
What is the relationship between climate and weather?

2. a. 1 Min. Brief Initiation: How do we get fresh vegetables all winter long? Greenhouse? What is it? Ever been in one? What are its characteristics? (damp, warm, humid air, smells strong?) – Visuals
The Greenhouse Effect is something that happens to the whole planet.
b. 15 min. Sentence Scramble on the 2 Greenhouse Effects- Can the group reach consensus on the solution? Share solutions to the puzzle.
c. Next task: After your groups has solved the scrambled sentence puzzle, use that information to make either a visual representation or a 3-dimensional model (materials include Cuisenaire rods, "found objects," etc). Teachers- take a pic if the model/presentation is temporary; keep in mind that the model will be referenced in next 2 classes so if they can be preserved, great! Be prepared to report out to another group in an entertaining way (sound effects, music OK). Be sure that all group members are involved in the presentation (See presentation rubric in supporting documents folder)
Natural Greenhouse Effect – 2-4 subgroups
• visual
• model
Anthropogenic (Manmade) Greenhouse Effect – 2-4 subgroups
• visual
• model

Week 1 - Open To invite inquiry and stimulate inquiry we will...

Amy Rios

Provocation Photos

Week 4 -Gather To research, gather information and deepen our understanding we will...

Amy Rios

Inquiring-Provocation

Amy Rios

1. Administer pre-assessment (Collect and return to Hugh).
2. Provocation-
a. Gallery walk in teacher-created groups of 3-4
b. Students have set up K(know)/Q(questions)/H(how do we think we'll answer the qus & learn) in inquiry notebook.
c. Groups look at set of images OR just one image per group and images rotate around room; students fill in KQL.
d. In large group-debrief. Teacher collects, records and categorizes questions; discuss thick/thin qu's as needed

Inquiring 4: What Is the relationship between climate and weather

Amy Rios

1. Review vocab and "importance" of this work (see #3 at end of previous lesson)
2. Before we can really talk about climate change, there is an important connection we need to clarify for ourselves. That's what the next activity is about.
3. Relationship Between Weather and Climate:
A numbered heads together quiz – Weather or Climate? (30 min)
• Low Risk Practice, Student Discourse, and Transfer of previous learning
• Groups of 3 or 4
• Each person has a number 1-3 or 1-4
• Quiz Show Ambience and Pace – Questions on topic
• 15 to 30 seconds to consult
• e.g. All the 2's stand up, etc...
• Who wants to answer first?

• No confirmation until all have answered
I'm going to read you a sentence. After consulting with your group, everyone in your group should have an answer to this question – is it about weather or climate?
4. Wrap-up: what is the difference between weather and climate? Weather is the temp/precip for a given place on a give day; climate refers to the weather of a location over a 30-year period.
*Extension: challenge students to come up with other examples of weather/climate for classmates to discuss
5. Teachers may want to pause here to have students revisit questions generated from the Provocation and/or generate new qu's
6. Closure: HW – article on Extreme Weather Potential (or could be done as an IRA, for GRGs or as part of another inquiry lesson)
How will you create opportunities for differentiation?
Extension: challenge students to come up with other examples of weather/climate for classmates to discuss

Inquiring-3-What is Climate?

Amy Rios

Brainstorm "CLIMATE change"; Word Splash; Vocab. Sort; Numbered Heads – Is this statement about Climate or Weather?; start HW: A short text on climate change – questions?
Materials:
Flipchart paper & markers
Word splash on flipchart paper or other projectable format
1. Rules of brainstorming:
- all ideas welcomed
- no discussion
- goal of 100% participation (give everyone a chance)
- time limit (5 min)
Question- What is climate change? Scribes record on flipchart; 10 minutes
2. Word Splash: Here are some words that are connected to this topic. Do you notice any overlap between our lists? Let's examine my list now. Which words do you have questions about? (Answer or elicit answers only on questions about pronunciation. Questions about meaning will be answered in the next activity.)
(10 min)
Word Splash Vocabulary: climate, weather, fossil fuels, pattern, Klinkii tree, Carbon Dioxide (CO_2), Water Cycle, Greenhouse Effect, deforestation, reforestation
Vocab. card sort – in partners or trios-students match words to definitions. T checks by saying which ones need to be fixed; as kids fix, challenge them to memorize words & definitions and quiz each other.
3.Now that you have some background information, why do you think this lesson might be important? (elicit and then fill in the gaps)
I have found the following ideas worth giving my attention to and sharing with others:
• that the world is getting warmer (the global climate is changing)
• that there is a strong connection between what humans do and climate change,
• that climate change unchecked is dangerous to life on Earth,
• that each of us can do something about it.

Assessment 2-Scientific Solutions

Amy Rios

I used to think...now I know... because
Become more knowledgeable about scientific solutions for climate change by reading/viewing at least 2 resourcesinPortaportal
Reflective statement using the visible thinking routine above
Criteria:
Demonstrates a changein thinking
Uses at least one fact to explain

Developing 7 Why is the Greenhouse Effect a problem

Amy Rios

Needs-students' visuals & completed sentence scrambles; assmt for LOI #1; article, "Greenhouse Effect-The Parliament of Australia"
1. In groups – Students share their models/visuals, and compare the two versions (manmade vs. natural)-What is the connection or difference between the two versions?
2. Whole Group Processing: Share solutions to the puzzle. Can the group reach consensus on the solution? OK, so now explain the visual. What is the natural Greenhouse effect? What is the manmade Greenhouse Effect? Why might this second one be a problem?
3. Video on impact of Greenhouse Effect- https://www.youtube.com/watch?v=Ge0jhYDcazY
This one is of the British woman putting CO2 in bottle & heating. Bill Nye has a better one: https://www.climaterealityproject.org/climate-101
4. Assess LOI #1- Interconnectedness between human actions and earth changes What does this assmt look like?
5. Optional- 5 min. Written or Oral Feedback (use any or all these questions)
• What did you learn about the Greenhouse Effect?
• What questions do you have that you can pursue on your own?
• What was this like for you?
• How did the groups function? What worked? What needs work? What would you change?
How will you create opportunities for differentiation?
Extension question: What would happen if there were no Greenhouse Effect? 6. Article, "Greenhouse Effect-The Parliament of Australia" (could be IRA, used for Guided reading, or here)

DELETE Developing 6 4 Spheres

Amy Rios

We need this lesson; pull from the biodome unit?
Grade 4 T's insert lesson on hydrosphere, biosphere, geosphere, atmosphere. Make connections to their work/representations made in previous class.

LOOK at last year's Grade 5 HTWW Unit too see if you want to use anythinng

Amy Rios

Week 2 - Immerse As a community of learners we will build prior knowledge, develop ideas and connect to concepts by...

Amy Rios

Learning experiences

Library 19-20Students will explore rights and responsibilities through literature. Students will discuss their responsibilities as citizens of RMMS. Students will create essential agreements for the library for their responsibilities.

Resources

- Top 10 Man-Made Disasters
- Chilean earthquake impact 1960
- Category 5 Hurricane map

- Volcano on ice cap
- Wildfires pic
- Worlds Largest Earthquakes
- Tectonic Plates Map
- 1925 Tri State Tornado newspaper
- Active Volcano Map
- Tsunami No Africa
- Tornado map
- CAFOD: Climate Change Animation for Primary Schools
- 1925 Tri State Tornado newspaper
- Climate change: Earth's giant game of Tetris - Joss Fong
- Climate change (according to a kid)
- AnInteractiveScienceInquiryintoPlateTectonicsIBPYP
- Causes and Effects of Climate Change | National Geographic
- 2-provocation pictures of erosion
- Kangaroo Gas and Global Warming — NOVA | PBS
- Activity-Sort Weathering and Erosion
- Natural Disasters - BrainPOP
- Interactive Map
- Who's Digging This?
- eGFI – For Teachers » Save Our Shore!
- Junior Paleontologist Program - Fossils and Paleontology (U.S. National Park Service)
- Greenhouse effect (in a bottle) explained

Reflecting

Teacher reflections

Ongoing reflection

Nora Greene • 3:33 pm, 11th Jan 2024

Showing students pictures of landforms as the provocation encouraged kids to think and wonder about what they were seeing and get excited. Students were able to independently explore the different natural disasters before receiving direct instruction about each type of disaster, leading to a deeper depth of understanding. The slideshow enabled students to stay engaged. Epic! is a highly engaging website that students are excited to use. All of the resources enhanced students' understanding and learning. Students showcased their learning and creativity through building dioramas that showed accuracy, creativity, and presentation skills. Students worked independently and collaboratively to complete this project. They also developed their research skills by using multiple resources to gather information about the topic and write an informative piece. Students frequently connected

the learning they did in Library and Spanish about natural disasters to what they were learning in class.

Assessment reflections

Ongoing reflection

Nora Greene • 3:34 pm, 11th Jan 2024

Teachers created a rubric to assess the diorama and will use the curriculum writing rubric to assess their informational writing. Students created dioramas and wrote informative pieces to showcase their learning and understanding of natural disasters. Students will present their learning to their classmates and to future scholars in the lower grades.