Explore a New Phenomenon

In October 2005, people in Northeast Africa took this photo of a huge crack in the ground that was not there before.

Warm Up

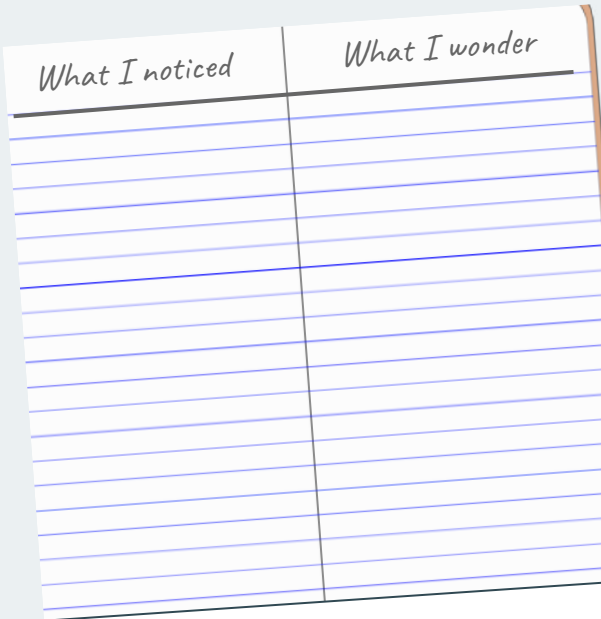
What might have caused this change in Earth's surface?

What do you want to know more about to explain this phenomenon?

Notice and Wonder

On your own

- Set up a Notice and Wonder chart.
- Read about the region and what happened there in the StoryMap.
- Record what you notice and wonder.



➔ Be ready to share your ideas with the class!

https://www.openscied.org/general/ethiopia-storymap/

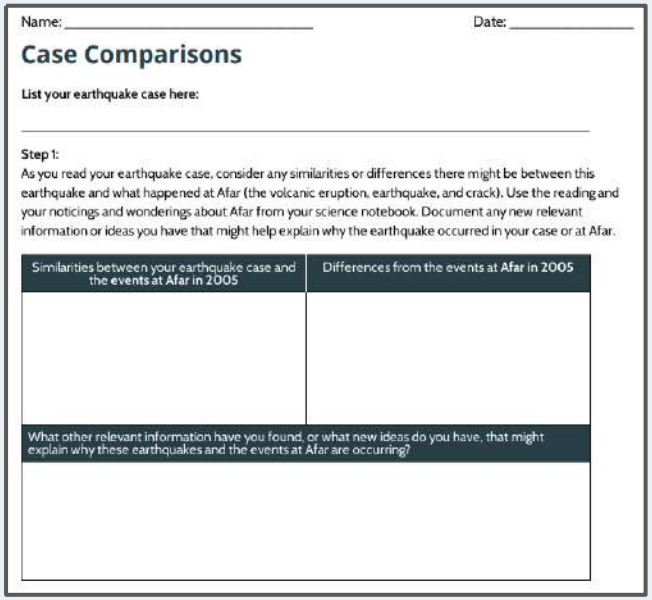
Share Noticings and Wonderings

With your class

Discuss what you noticed and wondered.

Look for Similarities and Differences

On your own



Name: _____ Date: _____

Case Comparisons

List your earthquake case here:

_____

Step 1:
As you read your earthquake case, consider any similarities or differences there might be between this earthquake and what happened at Afar (the volcanic eruption, earthquake, and crack). Use the reading and your noticings and wonderings about Afar from your science notebook. Document any new relevant information or ideas you have that might help explain why the earthquake occurred in your case or at Afar.

Similarities between your earthquake case and the events at Afar in 2005	Differences from the events at Afar in 2005

What other relevant information have you found, or what new ideas do you have, that might explain why these earthquakes and the events at Afar are occurring?

Complete Step 1 on the handout:

- Compare the earthquake you read about to the events at Afar: what is similar, and what is different?
- Is there anything else that might help explain why these earthquakes are occurring?

➔ Be ready to share with your group!

Look for Similarities and Differences

With your group

- Share each case with your group.
  - While others are sharing, complete Step 2 on the handout.

➔ Be ready to share with the class!

Warm Up

Open up Earthquake and Volcano Map on GC (Lesson 1 Simulations)

Let's explore an earthquake and plate boundary map.

- Do earthquakes happen in our region?
- Where in the world do earthquakes occur the most? Volcanoes?
- Where do earthquakes and volcanoes do not occur much?
- Why might we expect earthquakes to happen in some places but not others?

➔ Be ready to share with the class!

https://www.openscied.org/general/earthquake-volcano-map/

Look for Similarities and Differences

With your group

- Look back at our Afar Noticings and Wonderings chart.
- What similarities and differences do you see between your earthquake cases and the Afar case?
    - Complete Step 3 on the handout.

➔ Be ready to share with the class!

Share Similarities and Differences

With your class

Share any interesting similarities or differences you noticed between your case sites and the Afar earthquake/crack.

Share Initial Ideas

With your class

What could be causing the patterns of earthquakes and cracks?

- What is cracking or shaking, and how?
- What is happening to the surface in an earthquake?
- What is causing the changes at the surface in our cases and Afar?
- Are the processes at Afar and all the cases the same? What evidence do we have?

Initial Model for Large-Scale Changes

On your own

Develop a model to help show and explain what happened **below Earth's surface *before and during the Afar case*** (the past) to cause these sudden phenomena we observed at the surface:

- a large crack in the ground at Afar
- short-term shaking of areas near Afar

Consider your earthquake case. What will happen to that region in the *future* (after)? What might be causing change? What interactions might be happening?

➔ Be ready to share your ideas with the class!

Compare Models

With a partner

Compare your 2 initial models.

- What do you have in your models that is similar? Add a check mark (✔) to indicate where your models are similar.
- What do you have in your models that is different? Add a question mark (**?**) to indicate where your models diverge, where you disagree, or where you have questions.

Revisit Our Community Agreements

Individual Think Time

What strategies were productive for supporting our Community Agreements when we worked together in a Scientists Circle in our prior unit?

With your class

Discuss this as a class, as well as any new ideas you have.

Come to Consensus: East Africa

Scientists Circle

Come to consensus around what we know and do not know about:

- What is happening below Earth's surface to cause cracking and movement in the Afar region?

Consider Scale of Changes

With your class

We have made observations a
different spatial scales in Afar.

Small space	Large space

- What observable events happened at Afar?
- At what scale did they happen?

Come to Consensus: Other Locations

Scientists Circle

Come to consensus around what might be happening at our earthquake cases.

- What is similar?
- What is different?
- Why?

Develop Questions for the DQB

On your own

Record questions you have related to the things we have considered so far, including:

- the Afar StoryMap
- the map of earthquakes and plate
- the earthquake cases
- the models we have made
- earthquake experiences shared wi

- *Write one question per sticky note.*
- *Write in marker--big and bold.*
- *Put your initials on the back in pencil.*

Build the Driving Question Board (DQB)

1. With your class, gather around Driving Question Board.
2. Choose a volunteer to go first. This student reads their question and then sticks it onto the DQB.
3. Raise your hand if you have a question that is similar or the same. The first person calls on the next person, who reads their question, says how it relates, and then sticks it onto the DQB near the first sticky.
4. Repeat Step 2 until all similar questions in the room are stuck to the board.
5. Another student reads a new, unrelated question. Continue until everyone has at least 1 sticky on the DQB.

Reflect on Our Community Agreements

With your class

Think back to the discussion we had to develop our class consensus model and build the Driving Question Board.

- Which of our agreements did we do well with, and which do we need to work on?
- Mark one agreement you think we have done well on with a green sticky dot.
- Mark one agreement you think we need to improve on with a yellow sticky dot.

Share Ideas for Investigations and Data

With your class

What kinds of investigations could we carry out, and what additional sources of data might we need, to figure out the answers to our questions?

Navigate

We think something is causing Earth to move and/or crack during an earthquake.

On your own

Stop and jot your thoughts about the following questions:

- What could be causing the land to move or crack?
- Does land only move and crack during an earthquake, or could it happen where there is no perceptible shaking?

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