

Drought: Examining the Causes and Effects of Precipitation Shortage

Topic or Essential Question:

What factors contribute to the development of droughts?

Learning Objectives:

Students will be able to identify the causes of droughts and explain some effects of droughts.

Part 1: Observation and Discussion

Materials

Drought

Smart TV or some other presentation device

Students' Interactive Science Notebook

Lesson Steps

1. Project the drought picture on the Smart TV.
2. Have students complete a one-minute, silent solo looking at the image.
3. Then have the students write down their initial observations in their interactive science notebook.
4. Say to the students, "Let's look at this picture together."
5. Invite as many students as possible to share their ideas about what the image shows, guiding the discussion using these questions.
Student observations "What's going on in this picture?"
Ask for evidence "What do you see that makes you say that?"
Ask for more ideas "What more can we find?"

Make sure you listen carefully. Accept each student's comment neutrally. Then paraphrase the student's observations using different language but do not change the meaning. Point to the image. Take the opportunity to add appropriate vocabulary and link student's answers to prior knowledge.

6. Thank each student for their observations.
7. When the student observations wane, show them the next visual.
8. Turn to your elbow partner and share ideas you did not share with the whole class.
9. Have students summarize their observations and learning in their interactive notebook using a 2-minute Quick Write.

Part 2: Fence Post Activity

Materials *Make sure you listen carefully. Accept each student's comment neutrally. Then paraphrase the student's observations using different language but do not change the meaning. Point to the image. Take the opportunity to add appropriate vocabulary and link student's answers to prior knowledge.*

Drought Fenceposts

Paper strips divided into four rectangles

String
Tape
Color pencils

1. Students look at the four questions on the Drought fence posts.
2. Provide color pencils and paper strips to each student. Students will answer the four questions using the colors/symbols one answer in the appropriate box.
3. Remind students to copy the symbols exactly and take up the majority of the rectangle.
4. After everyone has completed their fencepost, line up the submissions side by side on a string so students can see the trends in the answers (or lay them down side by side on a long table if you can't string them up.).
5. Have students complete a one-minute, silent solo looking at the fence posts.
6. With their elbow partner, the students compare observations for one minute.
7. Then have the students write down their initial observations in their interactive science notebook.
8. Ask students the following questions.
 - a. What patterns do you notice?
 - b. What do the patterns tell us about our collected data?
 - c. Do you think the patterns would be different in other locations? Do you think the patterns would be different with other people?

Make sure you listen carefully. Accept each student's comment neutrally. Then paraphrase the student's observations using different language but do not change the meaning. Point to the image. Take the opportunity to add appropriate vocabulary and link student's answers to prior knowledge.

9. Thank each student for their observations.
10. Turn to your elbow partner and share ideas you did not share with the whole class.
11. Have students summarize their observations and learning in their interactive notebook using a 2-minute Quick Write

Part 3: Water in motion

[Water Cycle Dice Game](#) or [Water Cycle Board Game](#)
Dice

Part 4: Graph in water

Materials

Chromebooks
Google Sheets

1. Refer students to the data table on the [Water on Earth](#) spreadsheet
2. Working in pairs, students will create a graph depicting water on Earth.

Part 5: Drought

[What is Drought?](#)

[How does drought affect our lives?](#)

[Why is American running out of water?](#)

[Drought Protection](#)

1. Provide the above links to the students. Have them research what a drought is, how it affects our lives, and how communities protect against it.
2. Students will work in pairs to create a poster on the importance of water (using Canva, Google Slides, or paper/color pencils).
3. Students will present their poster to their classmates.

Part 6: Research

Materials

[Drought](#)

[Data Sketches -Student worksheet 1](#)

[Design Tools for Representing Data](#)

[United State Base Map](#)

[Data Sketches Grading Rubric](#)

Vellum tracing paper & paper clips

Color pencils

Interactive Notebook

1. Group students into groups of fours.
2. Review the 'Design Tools' handout and the original mapped data.
3. Remind students about the different symbols used during the fence post activity.
4. Looking at the Design Tools and the U.S. maps, lead a discussion using the following questions
 - a. What design tools were used to draw the data on the map?
 - b. What is included in the legend?
 - c. What other ways can the data be represented?
5. Give the group of four the maps from US Maps.
6. Ask the group to decide different ways to represent the data on the maps. Have them write their ideas down in their interactive notebooks.
7. Give the groups the Data sketches - student worksheet 1. Review the steps with the students.
8. Give the groups the base maps and vellum tracking paper. Have students fill out their map and make a sketch of their own on the tracing paper to represent the data with symbols, patterns or color from the legend they created.
9. Have the students follow the prompts (side 1 of the worksheet) and summarize what their sketch represents.
10. Have the students layer their maps two at a time. Have students look for patterns. Have the group write their findings down on large paper.

11. Post the large papers around the room. Have student gallery walk to see other groups' findings.
12. Have the group write a reflection after seeing all the groups' findings.

Part 5: Wrap Up

Materials

Interactive Science Notebook
 Claims, Evidence, & Reasoning Rubric

1. Lead a discussion with the following questions.
 - a. What are the causes of droughts?
 - b. What are the effects of droughts?
 - c. What additional data do we need?
 - d. What additional research do we need to do?

2. Have the students write a claim, evidence, and reasoning summary to the question, Why should communities prepare for drought?

	0	1	2	3
Claim		Claim is scientifically correct and complete or Correct multiple choice option chosen		
Evidence	Nothing turned in / Blank	Does not provide evidence, or only provides inappropriate evidence (evidence that does not support claim).	Provides appropriate but insufficient evidence to support claim or also includes some inappropriate evidence.	Provides appropriate and sufficient evidence to support claim.
Reasoning: Completeness		Does not provide reasoning, or only provides reasoning that does not link evidence to claim.	Some attempt is made to relate evidence to underlying principles, but there are missing pieces.	All of the ideas necessary to link the evidence to the claim are included.
Reasoning: Accuracy		The links between the evidence and the claim are based on incorrect ideas.	The evidence is tied to the claim by scientific principles established in the class, but there are also "extra" ideas that are incorrect.	The evidence is tied to the claim by scientific principles established in the class, AND there are NO "extra" ideas that are incorrect.