

Photo Description



The ground is very dry and cracked into many pieces. The dirt looks like puzzle pieces that don't fit together anymore. There are small plants trying to grow in some of the cracks.

Scientific Phenomena

This image shows drought conditions as the anchoring phenomenon. The cracked, dried mud occurs when soil loses its water content over time due to lack of rainfall and high temperatures. As water evaporates from the soil, it shrinks and contracts, creating tension that causes the ground to crack in polygonal patterns. The small plants visible are demonstrating resilience by finding ways to survive in harsh, water-scarce conditions.

Core Science Concepts

1. Water Cycle Disruption: When areas don't receive enough rain for long periods, the soil dries out completely
2. Material Properties: Wet soil is soft and moldable, but dry soil becomes hard and brittle
3. Plant Survival: Plants need water to live, but some can survive with very little water
4. Weather Patterns: Different places get different amounts of rain throughout the year

Pedagogical Tip:

Have students touch wet clay or playdough, then let it dry overnight. They can observe how the material changes from soft to hard and may even crack, making the abstract concept of drought tangible.

UDL Suggestions:

Provide multiple ways for students to express their observations: drawing pictures, acting out the cracking process with their bodies, or building models with clay to accommodate different learning preferences.

Zoom In / Zoom Out

Zoom In: At the microscopic level, soil particles are held together by thin films of water. When drought occurs, this water evaporates, causing the particles to pull closer together and create stress that results in cracking patterns.

Zoom Out: This local drought connects to larger weather systems and climate patterns. It affects entire ecosystems, from the plants and animals that live there to the farmers who grow food, showing how weather impacts communities across large regions.

Discussion Questions

1. What do you think happened to make the ground look like puzzle pieces? (Bloom's: Analyze | DOK: 2)
2. How might the small plants growing in the cracks be getting the water they need? (Bloom's: Evaluate | DOK: 3)
3. What patterns do you notice in how the ground cracked? (Bloom's: Analyze | DOK: 2)
4. If you were a farmer, what would you do if your field looked like this? (Bloom's: Create | DOK: 3)

Potential Student Misconceptions

1. Misconception: "The ground is broken and needs to be fixed"

Clarification: The cracks are natural and happen when soil loses water - it's not damaged or broken

2. Misconception: "Plants can't grow without lots of water"

Clarification: Some plants are adapted to survive with very little water and can grow in dry conditions

3. Misconception: "Drought only affects plants"

Clarification: Drought affects all living things, including animals and people who depend on water and plants

Cross-Curricular Ideas

1. Math - Patterns & Shapes: Have students trace and count the polygon shapes created by the cracks. They can create their own cracked ground patterns using clay and counting the number of pieces formed. This reinforces geometry and spatial reasoning.

2. ELA - Narrative Writing: Students can write or dictate a story from the perspective of a small plant growing in the cracked ground. What challenges does it face? How does it survive? This builds empathy and narrative skills while reinforcing science concepts.

3. Social Studies - Community Helpers: Explore how different people in a community are affected by drought (farmers, water workers, gardeners, emergency responders). Students can create a "Helpers During Drought" poster showing how communities work together during difficult times.

4. Art - Nature Patterns: Students can create artwork using natural materials (sticks, stones, dried leaves) to recreate the cracking patterns they see in the photo. They can also paint or color their own "cracked ground" artwork, exploring texture and pattern in creative ways.

STEM Career Connection

1. Meteorologist (Weather Scientist): A meteorologist studies weather and climate patterns to understand why droughts happen and predict when rain will come. They help farmers and communities prepare for dry times. Average Annual Salary: \$97,000 USD

2. Hydrologist (Water Scientist): A hydrologist studies water in the Earth—where it goes, how much we have, and how to save it during droughts. They figure out ways to help people have enough water even when it's dry. Average Annual Salary: \$89,000 USD

3. Agricultural Scientist (Farm Scientist): An agricultural scientist helps farmers grow plants that don't need much water and can survive droughts. They experiment with different ways to keep soil healthy and crops alive during dry times. Average Annual Salary: \$68,000 USD

NGSS Connections

Performance Expectation: 2-ESS1-1 Use information from several sources to provide evidence that Earth events can occur quickly or slowly

Disciplinary Core Ideas:

- 2-ESS1.C - The History of Planet Earth
- K-ESS3.B - Natural Hazards

Crosscutting Concepts:

- Patterns
- Cause and Effect

Science Vocabulary

- * Drought: A long time when an area gets much less rain than usual
- * Evaporate: When water changes from liquid to invisible water vapor in the air
- * Soil: The dirt and earth that plants grow in
- * Crack: A thin opening or split that forms when something breaks apart
- * Survive: To stay alive even when conditions are difficult

External Resources

Children's Books:

- The Magic School Bus Wet All Over by Joanna Cole
- Water is Water by Miranda Paul
- Come On, Rain! by Karen Hesse