

Photo Description



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

Scientific Phenomena

This image represents the Anchoring Phenomenon of soil desiccation and drought conditions. The cracking occurs when clay-rich soil loses moisture through evaporation. As water molecules leave the soil, the clay particles shrink and contract, creating tension that causes the ground to crack in polygonal patterns. This process demonstrates how water availability directly affects Earth's surface materials and the organisms that depend on them.

Core Science Concepts

1. Water Cycle in Action: The cracked soil shows evaporation happening - water from the ground goes up into the air as invisible water vapor.
2. Plant Survival Needs: The small plants growing in cracks demonstrate that plants need water, soil, and sunlight to survive, even in difficult conditions.
3. Earth Materials Change: Soil can change from soft and muddy when wet to hard and cracked when dry, showing how Earth materials have different properties.
4. Weather Effects on Land: Hot, dry weather can change the land by removing water and making the ground crack.

Pedagogical Tip:

Use a wet sponge that dries out over several days to help students visualize how water leaving the soil causes cracking. Let them feel the sponge when wet versus dry.

UDL Suggestions:

Provide multiple ways for students to explore this concept: tactile experiences with wet/dry clay, visual comparisons of before/after photos, and kinesthetic activities like acting out water evaporating from soil.

Zoom In / Zoom Out

1. Zoom In: At the microscopic level, tiny clay particles are held together by thin films of water. When the water evaporates, these particles shrink and pull apart, creating the visible cracks we see.

2. Zoom Out: This cracked soil is part of larger drought patterns that affect entire regions, impacting farming, water supplies, and ecosystems across vast areas of land.

Discussion Questions

1. What do you think happened to make the ground look like this? (Bloom's: Analyze | DOK: 2)
2. How might the plants in the cracks be getting the water they need? (Bloom's: Apply | DOK: 2)
3. What do you predict will happen to this ground when it rains? (Bloom's: Evaluate | DOK: 3)
4. Where else have you seen things crack when they get dry? (Bloom's: Remember | DOK: 1)

Potential Student Misconceptions

1. Misconception: "The ground is broken and needs to be fixed."
Clarification: Cracked soil is a natural process that happens when water evaporates, and it can return to normal when it rains again.
2. Misconception: "Plants can't grow in cracked ground."
Clarification: Some plants are very good at finding water deep in the cracks and can survive even when the top soil is dry.

NGSS Connections

- Performance Expectation: K-ESS2-1: Use and share observations of local weather conditions to describe patterns over time
- Disciplinary Core Idea: K-ESS2.D - Weather and Climate
- Crosscutting Concept: Patterns

Science Vocabulary

- * Evaporation: When water changes from liquid to invisible gas and goes into the air
- * Drought: A long time with very little rain when the ground gets very dry
- * Soil: The dirt that plants grow in, made of tiny pieces of rock and dead plants
- * Crack: A line where something splits apart or breaks
- * Survive: To stay alive even when things are hard

External Resources

Children's Books:

- The Magic School Bus Wet All Over: A Book About the Water Cycle by Joanna Cole
- Water Is Water: A Book About the Water Cycle by Miranda Paul
- A Seed Is Sleepy by Dianna Hutts Aston

YouTube Videos:

- "Water Cycle for Kids" - Simple explanation of evaporation and precipitation with animations (<https://www.youtube.com/watch?v=ncORPosDrjI>)
- "What Plants Need to Grow" - Educational video showing plant survival needs including water and soil (<https://www.youtube.com/watch?v=f2XQ97XHjVw>)