

Photo Description



This image shows a blue water valve and an orange traffic cone positioned near a sidewalk, grass, and a body of water. The valve appears to be part of the town's water system infrastructure, and there is visible water pooling or leaking around the area. This represents an everyday example of how water moves through human-made systems in our communities.

Scientific Phenomena

Anchoring Phenomenon: Water leaking from an underground utility valve system.

Why This Is Happening: Water stored in underground pipes is under pressure to deliver water throughout a community. When a valve ages, rusts, or develops cracks, water escapes from the system and flows onto the ground surface. This demonstrates that water is a liquid that always flows downhill and spreads to fill available space. It also shows how humans try to control water movement through infrastructure—and what happens when that system fails. This is a real-world connection to the properties of liquids and the importance of water management in our towns and cities.

Core Science Concepts

- * **Properties of Liquids:** Water is a liquid that takes the shape of its container and flows downward due to gravity. When water escapes its container (the pipe), it spreads across the ground.
- * **Water as a Resource:** Communities depend on underground pipe systems to deliver clean water to homes and businesses. This image shows what happens when the system leaks—water is wasted and may cause damage.
- * **States of Matter:** The water here is in its liquid state. Students can observe that liquids have no fixed shape and will flow to fill low areas on the ground.
- * **Human Engineering & Problem-Solving:** The traffic cone represents human attempts to warn others about the problem and control the situation. This connects to how engineers design systems to move and protect water.

Pedagogical Tip:

Use this real-world image to make states of matter relevant to students' daily lives. Rather than only demonstrating liquids with beakers in a classroom, anchor the lesson in their community's actual infrastructure. Ask: "Who fixes this?" and "Why does our town need this system?" This builds curiosity and shows that science isn't just in textbooks—it's in every sidewalk and street.

UDL Suggestions:

Provide Multiple Means of Representation: Some students may struggle with abstract concepts. Offer a video tour of a water treatment plant or invite a local utility worker to speak. Use photos, diagrams, and physical demonstrations. For English learners, use bilingual vocabulary cards. For students with visual processing needs, provide high-contrast images and simplified diagrams of the water system.

Provide Multiple Means of Action & Expression: Allow students to demonstrate understanding through drawing the water cycle, building a model pipe system, or writing an explanation. Some may prefer to create a poster warning about water leaks; others might build a working model of a valve.

Discussion Questions

1. What do you observe happening to the water around the valve? (Bloom's: Remember | DOK: 1)
2. Why do you think the water is flowing downhill and spreading across the ground instead of staying in one spot? (Bloom's: Explain | DOK: 2)
3. If you were an engineer fixing this leak, what would you need to know about how water behaves as a liquid to design a better solution? (Bloom's: Analyze | DOK: 3)
4. How might this water leak affect the community, and what steps could be taken to prevent it? (Bloom's: Evaluate | DOK: 3)

Extension Activities

1. Build a Model Water System: Provide clear plastic tubing, cups, water, and clay or tape. Have students design a simple water delivery system from a "reservoir" (cup) to a "home" (another cup), then deliberately create a leak with a pinhole. Ask: "How does the water behave? Where does it go? How would you repair it?" This hands-on model makes the abstract concept of piping concrete and memorable.
2. Community Water Audit: Take students on a safe neighborhood walk to identify water infrastructure (fire hydrants, drainage grates, water meters, sprinkler systems). Have them photograph or sketch these features and discuss: "Where does water come from? Where does it go?" Return to class and create a map showing the water system. Discuss why maintenance and repair are important jobs.
3. Liquid Properties Investigation Station: Set up four stations where students test liquids (water, cooking oil, honey, milk) by observing how they flow, spread, and behave in different containers. Create a chart comparing properties: Does it flow fast or slow? Does it keep its shape? Students record observations and connect back to the leaking valve image—all liquids behave this way, but we want to control them in our pipes!

NGSS Connections

Performance Expectation:

5-PS1-3: Make observations and measurements to identify materials based on their properties.

Disciplinary Core Ideas:

- * 5-PS1.A Matter and its Interactions – Properties of materials can be observed and measured to identify them.
- * K-PS2.B Motion and Stability: Forces and Interactions – Water flows and spreads; gravity pulls objects downward.

Crosscutting Concepts:

- * Systems and System Models – Water systems have inputs (sources), storage (pipes/reservoirs), and outputs (leaks/usage).
- Cause and Effect – When pipes age or break, the cause is structural failure; the effect* is water leaking out.
- Structure and Function – The valve's structure (seal) determines its function* (stopping or allowing water flow).

Science Vocabulary

- * Liquid: A state of matter that has a definite volume but no definite shape; it flows and takes the shape of its container.
- * Valve: A device that controls the flow of water or other liquids through a pipe by opening or closing.

- * Leak: An unwanted hole or crack that allows a liquid to escape from a container or pipe.
- * Infrastructure: The basic systems and structures (like pipes, roads, and bridges) that a community needs to work properly.
- * Gravity: The force that pulls objects downward toward Earth.
- * Pressure: The force that pushes on an object; in pipes, pressure pushes water through to reach homes and businesses.

External Resources

Children's Books:

Water is Water* by Miranda Paul (Exploring the water cycle and water systems)

The Water Cycle* by Rebecca Olien (Simple explanation of how water moves in nature and through communities)

Down the Drain: A Book About Water* by Elaine Moore (Focuses on water conservation and infrastructure)

YouTube Videos:

* "How Water Gets to Your Home" by National Geographic Kids – A 4-minute video showing how water travels from treatment plants through pipes to homes. <https://www.youtube.com/watch?v=9f0zddKCAI0>

* "States of Matter: Liquids" by Crash Course Kids – A 5-minute explanation of liquid properties with engaging visuals and real-world examples. https://www.youtube.com/watch?v=3u_tVnYo-0A

Teacher Tip: This is an excellent anchoring phenomenon for a multi-week unit on states of matter, water systems, and engineering. Return to this image multiple times as students deepen their understanding of how liquids behave and why infrastructure matters to communities.