States Of Matter

Physical Science | Lesson Guide

Kindergarten

Photo Description

This image shows a blue water pipe near a sidewalk next to a grassy area and water body. An orange traffic cone sits nearby, marking the area. Water is leaking or flowing from the pipe onto the ground, demonstrating how water moves and changes in our environment.

Scientific Phenomena

Anchoring Phenomenon: Visible water leaking from a pipe and flowing across land into a water body.

Why This Happens: Water naturally flows downhill due to gravity. When a pipe breaks or leaks, the water inside is under pressure and escapes, following the slope of the ground toward lower areas. This demonstrates that water is a liquid that takes the shape of its container and flows freely. In Kindergarten terms: water moves and spreads out wherever it can go, and it always tries to flow downward.

Core Science Concepts

* Gravity and Movement: Water and other objects naturally move downward due to an invisible force called gravity.

* Water as a Liquid: Water is wet, flows freely, and can spread across surfaces. It doesn't have a fixed shape—it takes the shape of whatever holds it.

* Cause and Effect: When a pipe breaks (cause), water leaks out and flows onto the ground (effect). Observing this helps children understand simple cause-and-effect relationships in nature.

* Properties of Water: Water is transparent (you can see through it), it's wet to the touch, and it moves to find the lowest place.

Pedagogical Tip:

Use this image to build from direct observation before introducing abstract concepts. Ask children to describe what they SEE first (blue pipe, water, cone, grass) before explaining WHY it happens. This concrete-to-abstract progression matches Kindergarten cognitive development.

UDL Suggestions:

Representation: Provide multiple ways to explore this concept. Some children may learn best through video observation of flowing water, while others benefit from hands-on exploration with water tables. Consider showing still images, slow-motion videos, and real-world observations.

Engagement: Connect the phenomenon to children's lives by asking, "Have you ever seen water leak from a hose?" or "What happens when you pour water?" This personal connection increases motivation and relevance.

Action & Expression: Allow children to demonstrate understanding through multiple modalities: drawing water flowing downhill, physically acting out water movement, or sorting pictures of water in different places (pipes, puddles, rivers, cups).

Discussion Questions

1. "Where do you think the water is going?" (Bloom's: Understand | DOK: 1)

2. "Why did someone put an orange cone next to the pipe?" (Bloom's: Analyze | DOK: 2)

3. "What would happen if we built a wall to stop the water from flowing? What would change?" (Bloom's: Evaluate | DOK: 3)

4. "How is this water similar to water from your bathtub faucet or a water fountain?" (Bloom's: Analyze | DOK: 2)

Extension Activities

1. Water Flow Exploration (Water Table Activity): Set up a shallow water table with various containers, funnels, and tubes. Children pour water and observe how it flows. Tilt a flat pan and watch water move to the lower end. Ask, "Can you make water flow uphill?" (Answer: not without help!) This builds direct understanding of gravity's effect on water.

2. Pipe Detective Walk: Take children on a supervised walk around the school to find pipes, gutters, and water drains. Discuss where water goes and why those structures are there. Help them trace water flow paths on the ground or in pictures. This connects the phenomenon to real-world infrastructure.

3. Water in Our World Sorting Activity: Provide picture cards showing water in different states and locations (ice, puddles, rain, snow, running faucet, ocean). Children sort and discuss: "Is this water moving or still? Is it hot or cold? Where did it come from?" This reinforces water's properties and movement.

NGSS Connections

Performance Expectation:
K-PS3-1: Make observations to determine the effect of sunlight on Earth's surface.
(Note: While this image primarily addresses water movement, it can extend to K-ESS2 concepts below.)

Disciplinary Core Ideas:
- K-PS2.A Forces and Motion (gravity and movement of water)
- K-ESS2.A Earth Materials and Systems (water and its properties)

Crosscutting Concepts:
- Cause and Effect (broken pipe !' water leaks and flows)
- Patterns (water always flows downward)

Science Vocabulary

* Liquid: A type of matter (like water) that flows and spreads out, but keeps the same amount.

* Gravity: An invisible force that pulls things downward toward the Earth.

* Flow: The way water moves from one place to another, usually going downhill.

* Pipe: A tube (often made of metal or plastic) that carries water from one place to another.

* Leak: When water accidentally escapes from a pipe or container where it's supposed to stay.

External Resources

Children's Books:

Water* by Manya Stojic (explores water in the environment through African savanna context)
Come On, Rain!* by Karen Hesse (celebrates water and weather through sensory language)
A Drop of Water* by Walter Wick (stunning photography of water in different forms)

YouTube Videos:
* "Water Cycle for Kids" by Crash Course Kids — A colorful, animated explanation of how water moves on Earth (https://www.youtube.com/watch?v=9H56pHIvRmE) - 4 minutes, age-appropriate for Kindergarten with teacher guidance

* "Where Does Rain Come From? | Science for Kids" by National Geographic Kids — Shows water movement in nature with clear visuals (https://www.youtube.com/watch?v=Obt34YdRgGw) - 3 minutes, engaging for young learners

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Implementation Note: This lesson works best when paired with direct sensory exploration. Use the image as a springboard for water table play, outdoor observation, and hands-on discovery. Kindergarteners learn by doing, so prioritize experiential learning over worksheet-based activities.