

## Photo Description



This photo shows a blue fire hydrant and an orange traffic cone sitting near a sidewalk beside a canal or waterway. The water in the background appears calm and blue. These objects are placed on grass near concrete, showing what happens when water stays in one place outdoors.

## Scientific Phenomena

Anchoring Phenomenon: Water exists in different places and forms in nature.

This image illustrates that water is present in our everyday environments—we can observe it in natural water bodies (the canal), and we can notice how human-made objects interact with these water sources. While not showing an obvious state change, the scene presents an opportunity to explore where water exists and how it behaves. Water in the canal is a liquid—it has a definite volume but takes the shape of its container (the canal). First graders can observe that liquids flow, move, and occupy spaces around solid objects (the hydrant, cone, and grass).

## Core Science Concepts

- Liquids have a definite volume but take the shape of their container. The water in the canal flows and fills the space, but you cannot pick it up like a solid object.
- Solids keep their shape. The fire hydrant and traffic cone do not change shape—they stay the same whether they are near water or not.
- Water is found in many places in nature. Students can observe water in bodies like canals, ponds, rivers, and oceans.
- Objects interact with water. Some things float on water, some sink, and some stay dry when near water.

### Pedagogical Tip:

For First Grade, avoid introducing complex state-change language like "evaporation" or "condensation." Instead, focus on observable, direct comparisons: "Is it a liquid or a solid? How do we know?" Use the hydrant and cone as touchstones—"Can you squeeze this cone? Can you squeeze water?" This concrete, tactile approach supports developmental readiness.

### UDL Suggestions:

Multiple Means of Representation: Show photos or videos of water in different locations (puddles, rain, bathtubs, oceans). Allow students to sort pictures of "liquids" vs. "solids" to reinforce the concept visually and kinesthetically. Multiple Means of Action & Expression: Encourage students to sort classroom objects into liquids and solids using manipulatives or hand motions (make a "solid" shape with arms vs. flowing "liquid" movements).

## Zoom In / Zoom Out

### Zoom In: The Invisible World of Water Molecules

Water looks smooth and calm in the canal, but if we could shrink down to a size smaller than an ant's eye, we would see billions and billions of tiny, invisible particles called molecules bouncing around and holding hands with each other. These water molecules are always moving—even when the water looks still! They slide past each other, which is why water can pour and flow. The fire hydrant is made of metal molecules that are packed tightly together, so they stay in one solid shape. First graders can understand this simply: "Water is made of teeny-tiny pieces that like to move around and stick together, but they're so small we can't see them!"

### Zoom Out: The Community Water System

This fire hydrant is part of a much bigger system that serves the entire neighborhood or town. Water comes from sources like reservoirs, rivers, or underground wells far away. It travels through pipes under the ground to reach homes, schools, and fire hydrants. The canal in the photo might be part of a drainage system that helps manage water in the community—it collects water and moves it to keep streets and properties safe from flooding. First graders can understand: "This hydrant is connected to pipes that bring water to help people and keep us safe. The canal helps water move around our town so it doesn't flood our homes."

## Discussion Questions

1. "What do you see in this picture? Where is the water?" (Bloom's: Remember | DOK: 1)
2. "How is the water different from the cone and the hydrant? How do we know?" (Bloom's: Analyze | DOK: 2)
3. "If we poured water into a cup, what would happen? Why is water different from this cone?" (Bloom's: Comprehend | DOK: 2)
4. "Where else have you seen water like this? Can you describe what it looks like?" (Bloom's: Apply | DOK: 2)

## Potential Student Misconceptions

Misconception 1: "Water disappears when it dries up."

- What students might think: When a puddle or wet spot dries, the water has vanished or disappeared completely.
- Scientific clarification: Water doesn't disappear—it changes into an invisible gas called water vapor and floats up into the air. We can't see it anymore, but it's still there! Help students understand by saying: "The water is still here, but it's changed into something we can't see, like air. It went up into the sky." You might notice wet shoes drying on a sunny day as evidence.

Misconception 2: "All liquids are the same as water."

- What students might think: Milk, juice, and water are all liquids, so they must behave exactly the same way and have the same properties.
- Scientific clarification: While all liquids flow and take the shape of their container, different liquids have different properties. Some are thicker (like honey), some taste different, and some are safe to drink while others are not. We can say: "All of these pour and flow, but they are different liquids. Water is special because we drink it and find it in nature."

Misconception 3: "The fire hydrant is full of liquid water inside."

- What students might think: Because water comes out when you open a hydrant, it must be filled with water like a cup.

- Scientific clarification: A fire hydrant is connected to underground pipes that carry water. The hydrant itself is a connection point, not a storage tank. When turned on, water flows through it from pipes beneath the ground. First graders can understand: "The hydrant is like a door. When firefighters open it, water comes from pipes under the ground, not from inside the hydrant."

### Extension Activities

1. "Solids and Liquids Hunt" – Take students on a short walk around the classroom or school grounds. Have them identify and point to things that are solids (toys, desks, cones, hydrants) and liquids (water fountains, puddles, paint water). Create a simple chart with pictures or drawings of what they find.
2. "Water in a Container Exploration" – Provide clear containers (cups, bowls) and water. Let students pour water from one container to another and observe that the water's shape changes but the amount stays the same. Ask, "Does the water look the same? Did the water disappear?"
3. "Sorting Game" – Gather various classroom objects (pencil, sponge, plastic cup, fabric) and a container of water. Ask students to predict which items are solids and which would change if water touched them. Test predictions together and discuss why some things absorb water while others don't.

### Cross-Curricular Ideas

#### Math Connection: Measurement and Data

Students can measure and compare the height of the fire hydrant, the traffic cone, and nearby objects using non-standard units (blocks, handspans, or string). They can create a simple bar graph or chart showing which object is tallest, shortest, or widest. Ask: "Is the hydrant taller than the cone? How many blocks tall is the hydrant?" This builds measurement skills while reinforcing observation of the photo's objects.

#### ELA Connection: Descriptive Language and Storytelling

Have students use sensory words to describe what they see, hear, and might feel near this canal. Create a shared writing chart with words like "blue," "smooth," "wet," "hard," "orange," and "flowing." Then, students can compose or dictate simple sentences: "The water is blue and smooth. The cone is orange and hard." You might also read picture books about water and have students retell the story or draw their favorite part, connecting literature to the real-world scene.

#### Social Studies Connection: Community Helpers and Safety

The fire hydrant is an important tool for community safety. Discuss how firefighters use hydrants to fight fires and protect neighborhoods. Students can learn about community helpers and their tools. You might invite a local firefighter to visit, or show a short video about fire safety. Ask: "Why do we need fire hydrants? Who uses them? How do they help our community?" This connects the image to civic responsibility and community awareness.

#### Art Connection: Color, Shape, and Mixed Media

Students can create artwork inspired by the photo using a variety of materials. They might paint or collage scenes with water (blue paper, watercolor, blue tissue), solid objects (construction paper cutouts of cones and hydrants), and the contrast between them. Encourage exploration of how colors mix (what happens when blue and orange are near each other?). Students could also sketch the scene with crayons or markers, focusing on the shapes they see: circles (hydrant opening, cone top), rectangles (sidewalk), and the irregular shape of water.

### STEM Career Connection

#### Water Systems Engineer / Plumber

This person designs and fixes the pipes and systems that bring clean water to homes and neighborhoods—like the pipes connected to the fire hydrant! They use math and science to figure out where pipes should go and make sure water flows safely. A plumber might also fix leaky faucets and help keep water systems working. A water systems engineer plans big projects that bring water to whole towns.

- Average Annual Salary: \$55,000–\$75,000 USD

#### Firefighter

Firefighters use fire hydrants to get water quickly when there's a fire. They learn about water, safety, and how to help people in emergencies. They are brave community helpers who use tools and science to protect neighborhoods. Part of their job is knowing where hydrants are and how to connect hoses to them fast.

- Average Annual Salary: \$50,000–\$65,000 USD

#### Environmental Scientist / Watershed Manager

This scientist studies water in nature—like the canal in the photo—to make sure it stays clean and healthy for plants, animals, and people. They protect rivers, canals, and waterways from pollution and help communities use water wisely. They might test water to see if it's safe and study how water moves through the environment.

- Average Annual Salary: \$65,000–\$85,000 USD

### NGSS Connections

#### Performance Expectation:

K-PS1-1: Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

#### Disciplinary Core Ideas:

- K-PS1.A: Properties of Materials – Students observe that materials can be described by their properties (solid vs. liquid).

#### Crosscutting Concepts:

- Patterns – Students recognize that solids and liquids have predictable patterns of behavior.  
- Structure and Function – The structure of a solid (holds its shape) serves a different function than a liquid (flows and fills space).

### Science Vocabulary

- Liquid: A material that flows and takes the shape of what holds it (like water).
- Solid: A material that keeps its own shape and doesn't change (like a cone or hydrant).
- Water: A liquid that we drink and see in nature; it flows and fills spaces.
- Canal: A man-made waterway or channel that holds water.
- Property: A special way something looks, feels, or acts (like being hard, soft, wet, or dry).

### External Resources

#### Children's Books:

- Water by Manya Stojic (explores water in nature and daily life)
- Splash! by Flora McDonnell (simple, engaging story about water)
- Rain by Manya Stojic (water cycle introduction through illustrations)

Final Note: This image provides a rich, real-world context for introducing the concept that materials have different properties. By grounding lessons in observable, familiar environments, you support First Grade students' natural curiosity and readiness for hands-on science exploration.