

Photo Description



This image shows a car engine with a clear plastic container holding yellowish liquid (coolant). You can see hoses, metal parts, and tools nearby. The liquid inside the container is one of many liquids that help cars work properly. We can observe that liquids take the shape of their containers and flow when poured.

Scientific Phenomena

Anchoring Phenomenon: Liquids take the shape of their containers and can flow from one place to another.

Why This Happens (Scientific Explanation for Teachers):

Liquids are a state of matter with particles that move freely but stay close together. Unlike solids (fixed shape) or gases (spread out everywhere), liquids flow and conform to container shapes while maintaining relatively constant volume. In this image, the engine coolant—a liquid—fills the bottom of the transparent reservoir, demonstrating how liquids behave. The cooling system uses this property intentionally: the liquid flows through engine passages to absorb and distribute heat, then returns to the reservoir. This is a practical application of liquid properties in real-world engineering.

Core Science Concepts

- * Liquids as a State of Matter: Liquids have no fixed shape but do have volume. They flow and take the shape of whatever container holds them—like the coolant in this reservoir.
- * Observable Properties of Liquids: Liquids are wet, flow, can be poured, and look different colors (this coolant appears yellowish-green). First graders can observe these properties directly.
- * Containers Hold Liquids: Solids and liquids need containers to hold them, but liquids need containers to keep their shape. Without a container, this coolant would spill.
- * Liquids in Everyday Life: Liquids are all around us—water, milk, juice, oil, and coolant. Understanding liquids helps students recognize materials in their daily environment.

Pedagogical Tip:

For First Grade, avoid heavy vocabulary like "density" or "viscosity." Instead, focus on sensory observations: "Does it flow?" "Does it keep its shape?" "What color is it?" Use simple comparisons: "Is it more like water or more like honey?" Hands-on exploration with safe liquids (water, sand, blocks) is far more effective than explanation alone.

UDL Suggestions:

Representation: Provide images, real objects, and demonstrations simultaneously. Some students learn best by seeing, others by touching (with safe materials). Use consistent color-coding when discussing liquids vs. solids.

Action & Expression: Allow students to sort materials into "liquid" and "solid" categories. Provide opportunities for students to pour, observe, and describe liquids using visual supports (picture cards with "flows," "wet," "takes shape of container").

Engagement: Connect to student interests: "What liquids do you see at breakfast?" (milk, juice, syrup). Use sensory-rich language and real-world contexts to maintain engagement.

Discussion Questions

1. "If we took the lid off this container, what do you think would happen to the yellow liquid?" (Bloom's: Predict | DOK: 2)
Guides students to think about liquid behavior—it would spill because liquids flow.
2. "Why do you think the car needs a container to hold this yellow liquid instead of just leaving it loose in the engine?" (Bloom's: Analyze | DOK: 3)
Encourages reasoning about the purpose of containers for liquids.
3. "Is the yellow liquid in this picture a solid or a liquid? How can you tell?" (Bloom's: Understand | DOK: 1)
Asks students to classify and justify using observable evidence.
4. "What other liquids have you seen in containers at home or school?" (Bloom's: Remember/Apply | DOK: 1)
Connects the concept to students' everyday experiences.

Extension Activities

1. Liquid Sorting Exploration: Gather safe, age-appropriate liquids (water, milk, syrup, cooking oil in sealed containers) and solids (blocks, rocks, crayons). Have students sort items into "Liquid" and "Solid" categories using a two-column chart with pictures. Discuss why liquids need containers while solids do not.
2. Pouring Practice Station: Set up a water table or tray with funnels, cups, pitchers, and water. Let students pour water between different-shaped containers to observe that the liquid changes shape but stays the same amount. Ask: "Does the water look different? Does it still feel wet?"
3. "Liquids in My World" Picture Walk: Take students on a classroom/school walk to identify liquids they see (water fountain, paint in art area, hand sanitizer). Create a class book: draw or photograph each liquid found, and label it. Discuss: "What do all these things have in common?"

NGSS Connections

Performance Expectation:

K-PS1-1: Plan and conduct investigations to provide evidence that objects can be sorted and classified by the properties of the materials from which they are made.

Disciplinary Core Ideas:

K-PS1.A: Matter and its Interactions* – Students observe and describe that materials can be sorted by observable properties (shape, color, texture, size).

Crosscutting Concepts:

* Properties of Materials – Observing and describing the properties of solids and liquids helps students understand how materials behave.

* Systems and System Models – The cooling system demonstrates how liquids move through connected parts to accomplish a function.

Science Vocabulary

* Liquid: A material that flows and takes the shape of its container, like water or juice.

* Container: Something that holds or keeps things inside, like a cup, bottle, or reservoir.

- * Flow: When something moves slowly from one place to another, like water pouring from a pitcher.
- * Properties: The special characteristics of something that help you identify it, like color, shape, or whether it's wet.
- * Solid: A material with a shape that stays the same, like a block, pencil, or rock.

External Resources

Children's Books:

What Is a Liquid? by Rebecca Stefoff (part of the Exploring States of Matter* series) – Simple, illustrated exploration of liquids in everyday life.

The Way Things Work* by Macaulay (simplified version for early readers) – Shows how liquids are used in real machines.

Liquids and Solids* by Lola M. Schaefer – Compares solids and liquids using relatable examples.

YouTube Videos:

* "Liquids and Solids for Kids" by Kids Learning Tube (3:12 minutes) – Animated introduction to states of matter with clear, colorful examples. <https://www.youtube.com/watch?v=pxuvxC5nAHw>

* "Explore Matter: Solids and Liquids" by National Geographic Kids (5:20 minutes) – Real-world demonstrations of how liquids behave with engaging narration. <https://www.youtube.com/watch?v=ydJ3T0Zf8bE>

Instructional Note: This lesson anchors First Grade students in observable, concrete experiences with liquids. The car engine image is relatable and safe to discuss (not to disassemble!). Move from observation → sorting → comparison → real-world application to build conceptual understanding progressively throughout the unit.