

OVERVIEW

SOLIDS AND LIQUIDS



GOALS

The **Solids and Liquids Module** provides experiences that heighten students’ awareness of the physical world. Matter with which we interact exists in three fundamental states: solid, liquid, and gas. In this module first and second graders have introductory experiences with two of these states of matter, solid and liquid.

FOSS EXPECTS STUDENTS TO

- Develop curiosity and interest in the objects that make up their world.
- Investigate materials constructively during free exploration and in a guided discovery mode.
- Recognize differences between solids and liquids.
- Explore a number of liquids.
- Observe and describe the properties of solids and liquids.
- Sort materials according to properties.
- Combine and separate solids of different particle sizes.
- Observe and describe what happens when solids are mixed with water.
- Observe and describe what happens when other liquids are mixed with water.
- Use information gathered to conduct an investigation on an unknown material.
- Acquire the vocabulary associated with the properties of solids and liquids.
- Use written and oral language to describe observations.

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SOLIDS AND LIQUIDS MODULE MATRIX

SYNOPSIS

SCIENCE CONTENT

THINKING PROCESSES

1. SOLIDS

Students explore solid objects, such as pieces of wood, plastic, and metal. They observe, describe, and sort the objects according to their properties. They construct towers (and other structures), using the properties inherent in the materials to accomplish the task.

- Solids are one state of matter.
- Solid materials have properties that separate them from other states of matter.
- Solids can be sorted by their properties.
- Solid materials have distinct uses based on their properties.

- Observe several kinds of solid materials.
- Compare properties of solid materials.
- Sort solids in different ways.

2. LIQUIDS

Students investigate liquids in a variety of settings to become familiar with their properties. A number of games are used to rehearse precise liquids vocabulary. Students also use representational materials to enhance their understanding of the unique behaviors of liquids.

- Liquids are one state of matter.
- Liquids have many properties.
- Liquids pour and flow.
- Liquids take the shape of their container.
- The surface of liquid is level with respect to the ground.

- Observe and describe properties of different liquids in bottles.
- Compare the appearance and behavior of different liquids in containers.

3. BITS AND PIECES

Students work with beans, rice, and cornmeal to find out how solids behave when the pieces are small. They shake, rattle, and roll the materials in bottles, pour them from container to container, and separate them using screens.

- Solid materials come in all sizes and shapes.
- Particles of solid materials can pour like liquids, but maintain their shape.
- Solid materials can support denser materials on their surface.
- Mixtures of solid particles can be separated with a screen.

- Observe properties of solid particles in different containers.
- Separate a mixture of solids by using screens.
- Observe and describe the properties of solid particles in closed bottles.
- Use representational materials to separate particles based on size.

4. SOLIDS AND LIQUIDS WITH WATER

Students investigate interactions between solids and water and liquids and water. They observe, describe, record, and organize the results. In the culminating activity students test toothpaste to determine if it is a solid or a liquid.

- Some solids change when mixed with water; others do not.
- Some solids dissolve in water; evaporation leaves the solid behind.
- Some liquids mix with water; other liquids form a layer above or below water.

- Observe and describe what happens when solids and water are mixed.
- Observe and describe what happens when liquids and water are mixed.
- Organize observations of mixtures.

- Make “My Book of Solids.”
- Draw and label constructions.
- Make solid collages.
- Sort by geometric shapes.
- Build towers from clues.
- Introduce Venn diagrams.
- Set up a solids sorting center.
- Build a paper bridge.

• *Everything Matters*

Students play I Spy with family members, describing the properties of solids spied at home and guessing at their identity.

- Write about being a chemist.
- Graph water amounts in containers.
- Buy solids and liquids.
- Make a picture collage of liquids.
- Make a museum of liquids.
- Conduct float and sink investigations.
- Evaporate water.
- Student projects.

• *Solids and Liquids*

Students record their observations and the identity of a liquid found at home. In class they compile their recordings to form a class book of liquid “riddles.”

- Compare solids and liquids.
- Create sound and touch poetry.
- Graph a trail-mix snack.
- Estimate number of beans in a handful.
- Create 15-bean soup-mix art.
- Make bottle art.
- Separate mixtures with magnets or sifters.
- Investigate fine powders.
- Mix solids to make layers.

• *Solids to Liquids and Back Again*

Students investigate what happens when solids and liquids are poured on porous and nonporous surfaces, such as plastic and paper towels.

- Describe oobleck.
- Time ice melting.
- Enlarge a recipe.
- Change states of matter.
- Make an ocean in a bottle.
- Make liquid layers.
- Mix colors and media.
- Make soft drinks.

• *Mix It Up!*

Students use solids and liquids to make a salad dressing and observe what happens when the materials are mixed.

