

Solids and Liquids: Who Messed Up My Sand?

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Science Objective

Through hands-on activities and an engaging problem that children must solve, children explore the different properties of solids and liquids. Children learn that matter exists in two states: solids and liquids, and that matter can change form. They also learn that liquid flows, takes the shape of its container, and like solids, can be sorted in different ways.

iScience Puzzle: Salt in the Sandbox

Children must figure out how to sort two solids, salt and sand. In the process, they explore properties of solids: size, hardness, solubility. Because salt dissolves in water, adding water to a mixture of salt and sand will take salt out of sand.

Objectives ► Children will:

- sort solids by size.
- sort objects by hardness.
- compare and contrast the properties of salt and sand.
- explore hardness by crushing solids with different degrees of hardness.
- explore the properties of liquids.

Materials

- colander
- dried beans
- jars filled with liquids (e.g., oil, water, soda, liquid soap, syrup)
- kitchen strainer
- rice or sesame seeds
- rock for crushing salt and sand
- salt
- sand

Lesson Plan

Before Reading

Investigation

Pass around small containers of sand and salt. Ask children to describe the texture of sand and salt. Ask: *Is one harder than the other?* Compare and contrast the two solids in a Venn diagram on the board.

Science Concepts

Hardness is a property of solids.

Bring in small jars filled with different liquids: oil, water, soda, liquid soap, syrup. Have children describe them. Display these containers while children read the book, and refer to them when children read about the properties of liquids.

Different substances have different properties.

Explain that children will read about salt and sand, as well as many other solids and liquids. Encourage children to relate the information to their personal experiences as they answer the questions in the book.

During Reading

Investigation

p. 6: Discuss the suggestions, and ask children if they have any other ideas. Ask: *What might happen if salt and sand were mixed with water? Have you ever put salt into a pot of soup? What happens to the salt?*

Some solids can dissolve in liquids.

pp. 7–8: Explore other types of solids and ways to sort them. Use objects in the classroom, such as writing paper and colored construction paper, that can be sorted by color, texture, weight, and size.

Solids come in many sizes, shapes, weights, colors, and textures.

p. 10: Discuss why it is important to know the hardness of a solid. Ask: *Why are soccer balls softer than baseballs?* Create a word web on the board, with the words *ways to sort* in the center; then have children name *ways to sort* in the outer circles.

Solids can be sorted by hardness. Solids have different uses based on their properties.

p. 11: Refer back to the Venn diagram children completed in Before Reading. Ask: *Can you add anything to the Venn diagram?* Have children do the activity for hands-on learning.

Different substances have different properties.

p. 12: Divide children into small groups. Give each group a classroom object, such as a ruler or a pencil. Have groups describe the properties of their object, and then share their findings with the class.

Demonstrating scientific knowledge and achievement builds confidence.

During Reading (continued)

Investigation

Science Concepts

p. 13: Hold up the small jars you displayed in Before Reading and discuss the properties of liquid. Ask: *What liquid is thin and what liquid is thick? Which liquids pour more easily? What liquids have different colors?* Pour water from one container to another container that has a different size to help children see that liquid takes the shape of its container.

Liquids have different properties, including color, weight, and thickness.

pp. 14–15: Ask: *Have you ever put sugar in water? What happened? Is sugar like salt?*

Some solids can change form when combined with liquid.

p. 19: Tell children that we get salt from the ocean. The water dries up and salt is left behind.

Some solids dissolve in water or liquid; when the liquid evaporates, the solids are left behind.

p. 21: Write children's suggestions on the board and discuss each one. Have them find pages in the book that helped them find the best method.

Mixtures of solids can be sifted and separated with a screen.

After Reading

Restate the main ideas in this book. Solids and liquids can be sorted by their different properties. Some solids change form when they are dissolved in water. Encourage children to explain what they learned in this book.

Investigation

Understanding Science

Have children name other examples of solids and liquids, and explain how they are alike and different.

Demonstrating scientific knowledge and achievement builds confidence.

Bring in ingredients for making lemonade. Have children describe what happens when sugar dissolves in the water.

Making observations is fundamental to the study of science.