

Lessons at a Glance

Solids, Liquids, and Gases Unit Overview

The Solids, Liquids, and Gases Unit begins with children exploring and describing the properties of everyday objects. They consider the materials that make up various objects and think of how the properties of these materials make the objects useful. As the unit progresses, children focus on properties that distinguish liquids, solids, and gases. They compare and contrast different liquids to identify properties that liquids share. They change the shapes of solids by folding, tearing, or breaking, and then identify properties that solids share. The unit ends with children making predictions about water and observing water as it freezes, melts, and evaporates.

Science Content: Big Ideas

The Solids, Liquids, and Gases Unit concentrates on the following Big Ideas. Along with the scientific Habits of Mind discussed on pages 6-7, these concepts are reinforced throughout the unit. The lessons in which each Big Idea is introduced or is a major focus are indicated in parentheses.

- Objects have many properties that we can observe directly and with tools. (Lesson 1)
- Materials have properties that make them useful. Objects are made of many materials. (Lesson 2)
- We classify objects as solid, liquid, or gas based on their properties. (Lessons 3-5)
- Water can change from a liquid to a solid, and back to a liquid. Water “disappears” from an open cup, becoming a gas. (Lesson 6)

Lesson Overviews

The following overviews briefly summarize each lesson in the Solids, Liquids, and Gases Unit. Additional notes and suggestions for scheduling are shown in gray. An asterisk after the lesson title indicates a core lesson.

Lesson 0: Doing Science

Children sharpen their awareness of scientific thinking and become familiar with the “I Wonder” circle as they conduct a self-directed exploration and then reflect on the processes they engaged in. In the context of these experiences, they are introduced to the work of scientists and to the Science Companion “I Wonder” circle, which provides a visual representation of many of the facets of scientific inquiry, exploration, and discovery.

Lesson 1: Properties of Objects*

Children work with various objects to identify and compare properties such as size, weight, shape, color, flexibility, and texture. They discuss which properties they measured with tools, and which properties they observed with only their senses. They are introduced to the idea that objects can be described in terms of their properties and also in terms of the materials they are made of.

If you have access to other Science Companion units, consider teaching the Skill Building Activity “Observing and Describing” prior to this lesson. (See the Level 1 Motion Unit. Or see the Level 2 Sound Unit, Rocks Unit, or Life Cycles Unit.) The Skill Building Activity “Measuring Small Things” might also be helpful to prepare children for measuring length and width. (See the Level 1 Collecting and Examining Life Unit.) To give children practice sorting objects by different properties before or after this lesson, conduct one of the sorting activities in the Further Science Explorations.

Lesson 2: What Are Things Made Of?*

In this lesson children identify the different materials that make up familiar objects. They discuss the properties of different materials, and think about why people choose different materials to make things.

Lesson 3: Solids, Liquids, and Gases in Our World*

In this lesson children classify substances in the classroom as solid, liquid, or gas. Then they take a walk outside to look for more solids, liquids, and gases and practice classifying them.

This lesson may be conducted in one or two sessions. Two sessions are recommended for younger children.

Lesson 4: Comparing Liquids*

Children compare different liquids to identify properties the liquids share or don't share. They also pour water between different containers, observing the changing shape of this liquid.

You may want to conduct the "Pouring and Observing Water" exploration before or after the lesson to give children ample time to observe water as they pour it from container to container. If state or local standards require exploring the properties of gases, consider conducting some of the Further Science Explorations about this topic.

Lesson 5: Changing the Properties of Solids*

Children work with objects that are all classified as solids, but that differ in many ways. The children try to change one property of each object by trying to change its shape. Next, the class thinks of things they could do to the solids to change other properties. Finally, they discuss which property makes each dissimilar object a solid.

If state or local standards require children to make and separate mixtures, consider conducting some of the Further Science Explorations about mixtures.

Lesson 6: Water Can Be Liquid, Solid, or Gas*

In this three-session lesson, the children experience the changing states of water. In Session 1, they place water in resealable bags and predict how the water will change after they put it in the freezer. They also predict what will happen to the water levels of a covered cup of water and an uncovered cup of water over several days. In Session 2, they observe their frozen water changing from a solid to a liquid, and discuss other materials they know that can change between solid and liquid. Finally, in Session 3, they revisit the covered and uncovered cups of water to discover what happened.

This lesson is conducted over three sessions. Children who have completed the Science Companion Level 1 Weather Unit may already be familiar with the concepts presented in this lesson. If state or local standards do not require you to introduce water changing from a liquid to a gas at your class's grade level, consider omitting part of Session 1 and all of Session 3.