

Lessons at a Glance

Science Content: Big Ideas

The Weather Unit concentrates on the following “Big Ideas” about weather and the natural phenomena that cause it. Along with the scientific “Habits of Mind” discussed on page 6, these concepts should be reinforced throughout the unit. The lessons in which each big idea is introduced or is a major focus are indicated in parentheses.

Weather Conditions

- Weather is how the sky looks and feels. (Lesson 1)
- Weather is how the sky looks and feels. A meteorologist observes, measures, describes, and records the weather. (Lesson 2)
- Weather is measurable. (Lessons 3 and 4)
- Weather is measurable. The sun plays a role in weather. (Lesson 5)

Weather Patterns

- We notice weather patterns by observing, measuring, and graphing weather over time. (Lessons 6, 11, 16, 19–21, and 26–29)

Water

- Water, in its many forms, plays a role in the weather. (Lessons 7–10, 12–15, 17, and 18)

Air and Wind

- Air plays a role in the weather. Air surrounds us, and takes up space. (Lesson 22)
- Air plays a role in the weather. Wind is a moving flow of air. (Lessons 23–25)

Skill Building Activities

- A compass can be used to find north and other directions. (Skill Building Activity 1: Using a Compass)
- Number scales give precise temperature measurements. (Skill Building Activity 2: Reading Number Scales on Thermometers)
- A magnifying lens makes things look larger than they really are. You can use a magnifying lens to examine objects closely and to see details that you might not see without it. (Skill Building Activity 3: Using Magnifiers)

Lesson Overviews

The following overviews briefly summarize each lesson in the Weather Unit. Core lessons are indicated with an asterisk. Suggestions for scheduling and flexible implementation are shown in gray.

Lesson 0: Doing Science*

Children sharpen their awareness of scientific thinking 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: What Is Weather*

Children look at pictures of various types of weather, talk about their perceptions of weather, and listen to poems about the weather. The class writes a weather poem and develops a definition of weather.

The Explore section of the lesson in which students read and write poetry can be taught during language arts.

Lesson 2: What Is a Meteorologist?*

Children learn about some symbols and descriptive terms commonly used by meteorologists. A class meteorologist starts recording daily weather observations on a class weather calendar.

Lesson 3: Using a Thermometer*

Children use thermometers to measure temperature. They learn how to use a thermometer color scale, and practice reading the color scale by measuring the temperature of their hands and the air.

Lesson can be taught during mathematics.

Lesson 4: Measuring Temperature*

Children measure water and air temperatures to practice reading the thermometer color scale. The class meteorologist begins recording the outdoor temperature on the weather calendar.

Lesson can be taught during mathematics.

Lesson 5: The Sun Warms*

The children turn their attention to the sun and think about its role in making weather. They focus on how sunlight both illuminates and warms. Children compare shady and sunny locations by measuring each location's temperature and observing how long it takes ice cubes to melt.

Lesson 6: Discovering Weather Patterns: September*

Children record and analyze the daily weather observations compiled from September's class weather calendar. They also learn to use sky observation data to make a bar graph.

The exploration, "Demonstration: Making a Bar Graph," can be taught during mathematics.

Lesson 7: Measuring Rainfall*

Children think about the role of water in weather and learn how to measure rainfall. They practice reading the rain gauge, speculate about how the class meteorologist might use rain data, look at a model of annual rainfall, and use their rain observations to summarize the day's weather.

Lesson 8: Clouds in the Sky

The children consider how clouds are made. They look at a cloud chart and make models of the three basic cloud shapes—cumulus, cirrus, and stratus.

Lesson 9: Water Freezes: Ice*

Understanding how water changes—from liquid to solid and back again—is essential to understanding weather. In this lesson, the children place small items in cups of water and observe what happens when they freeze them. Other lessons about water focus on how water melts, evaporates, and condenses.

Lesson 10: Water Melts*

The children experiment with the water they froze in Lesson 9. They explore ways of making the ice melt and continue to practice thermometer skills by measuring the temperature of the ice and the water as it melts.

Lesson 11: Discovering Weather Patterns: October*

Children record and analyze the daily weather observations compiled from October's class weather calendar. They make two bar graphs: sky observations and temperature colors.

The Explore section of this lesson can be taught during mathematics.

Lesson 12: Water Goes Into the Air*

Understanding how water changes—in this lesson from liquid to vapor and back again—helps us understand weather. Children explore the unfamiliar idea that water can be a part of the air, an invisible gas called water vapor. They are introduced to the idea by watching liquid water disappear into the air as it evaporates.

Lesson 13: Water Comes Out of the Air*

Children continue to explore the idea that water can be a part of the air. They watch as water condenses out of the air and forms droplets on cold surfaces.

Lesson 14: Exploring Dew*

On cool mornings the ground is often damp with dew—moisture has condensed on cooled surfaces overnight. The children investigate this phenomenon by taking a morning dew walk. They discuss where the liquid water came from.

Lesson 15: Catching Dew

Children continue to investigate dew. In session 1, they review their theories of dew formation from Lesson 14 and set up “dew catchers.” In session 2, they monitor the dew catchers and develop a more sophisticated understanding of where dew comes from.

Lesson 16: Discovering Weather Patterns: November*

Children record and analyze the daily weather observations compiled from November’s class weather calendar. In addition to sky observations and temperature data, they record and analyze precipitation data.

The Explore section of this lesson can be taught during mathematics.

Lesson 17: Water Freezes: Frost

Children create frost and observe the conditions that are conducive to frost formation. They learn that frost, like dew, is water that comes out of the air. They also learn that frost, unlike dew, forms as tiny ice crystals rather than water droplets. In cold climates, the children examine winter frost and draw pictures of it.

Lesson 18: Water Freezes: Snow*

The children look at snowflakes in photomicrographs and in photographs or drawings. They observe how snowflakes form in six-sided (hexagonal) or six-pointed patterns of many designs and make their own representations of snowflakes from paper and pattern blocks. If snow is available, children observe preserved and fresh snowflakes and compare the volume of snow to the volume of melted snow.

Lesson 19: Discovering Weather Patterns: December*

Children record and analyze the daily weather observations compiled from December's class weather calendar. In addition to sky observations and temperature data, they record and analyze precipitation data.

The Explore section of this lesson can be taught during mathematics.

Lesson 20: Discovering Weather Patterns: January*

Children record and analyze the daily weather observations compiled from January's class weather calendar.

The Explore section of this lesson can be taught during mathematics.

Lesson 21: Discovering Weather Patterns: February*

Children record and analyze the daily weather observations compiled from February's class weather calendar.

The Explore section of this lesson can be taught during mathematics.

Lesson 22: Air Surrounds Us*

Children investigate some of the properties of air. They observe a demonstration of how air fills the "empty" space in a bottle, and experiment with air trapped inside objects and plastic bags.

Lesson 23: Observing Wind*

Children go outdoors to experience wind and observe the direction of the wind. They are also introduced to the concept of the four cardinal directions. In an optional but recommended exploration, they use a weathervane to determine wind direction.

Lesson 24: Making Wind Tools*

The children discuss how people use various tools to learn about the wind. They make tools that can measure wind strength and speed.

The Explore section of the lesson in which students make windsocks and pinwheels can be taught during art.

Lesson 25: Measuring Wind*

Children sense and measure wind speed, strength, and direction using the tools they made in the previous lesson. They learn several different categories of wind speed.

Lesson 26: Discovering Weather Patterns: March*

Children record and analyze the daily weather observations compiled from March's class weather calendar.

The Explore section of this lesson can be taught during mathematics.

Lesson 27: Discovering Weather Patterns: April*

Children record and analyze the daily weather observations compiled from April's class weather calendar.

The Explore section of this lesson can be taught during mathematics.

Lesson 28: Discovering Weather Patterns: May*

Children record and analyze the daily weather observations compiled from May's class weather calendar.

The Explore section of this lesson can be taught during mathematics.

Lesson 29: Discovering Weather Patterns for the Year*

Children compile their year of weather data and reflect on overall patterns over the months and seasons.

The Explore section of this lesson can be taught during mathematics.

Skill Building Activity 1: Using a Compass

This skill building activity teaches children how to read a compass to find north, and from there to determine the other cardinal directions, a skill needed for several Level 1 Weather Unit lessons.

This lesson can be taught during social studies.

Skill Building Activity 2: Reading Number Scales on Thermometers

Children become familiar with the numbers and marks on their thermometers. They relate the color scale to numbers on the number scale, and then practice reading just the number scale. Teach this skill building activity to individual children as they are ready, or to the whole class.

This lesson can be taught during mathematics.

Skill Building Activity 3: Using Magnifiers

Children learn how to use a magnifying lens, like the ones supplied in the Science Companion ExploraGear. There is also an extension in which children learn how to use a jeweler's loupe.