

What Is It Like Outside?



Focus: Students will describe daily changes in temperature and weather.

Specific Curriculum Outcomes

Students will be expected to:

- 1.0 pose questions that lead to exploration and investigation [GCO 2]
- 2.0 pose new questions that arise from what was learned [GCO 2]
- 3.0 communicate using scientific terminology [GCO 2]
- 4.0 explore and investigate changes in heat and light from the sun [GCO 1/3]
- 5.0 follow safety procedures and rules [GCO 2]
- 6.0 devise ways to measure and record daily and seasonal environmental changes [GCO 1/3]
- 7.0 make and record observations and measurements [GCO 2]
- 8.0 communicate while exploring and investigating [GCO 2]
- 13.0 propose an answer to the initial question or problem and draw a simple conclusion [GCO 2]

NOTES:

Performance Indicators

Students who achieve these outcomes will be able to:

- describe daily changes in air temperature and light
- describe and predict weather
- draw a picture showing differences in light and heat in summer and winter

Attitude Outcome Statements

Encourage students to:

- recognize the role and contribution of science in their understanding of the world [GCO 4]
- consider their observations and their own ideas when drawing a conclusion [GCO 4]
- appreciate the importance of accuracy [GCO 4]
- show concern for their safety and that of others in carrying out activities and using materials [GCO 4]

Cross-Curricular Connections

English Language Arts

Students will be expected to:

- communicate information and ideas effectively and clearly, and to respond personally and critically [GCO 2]
- interpret, select, and combine information using a variety of strategies, resources, and technologies [GCO 5]
- create texts collaboratively and independently, using a variety of forms for a range of audiences and purposes [GCO 9]

Getting Organized

Program Components	Materials	Before You Begin	Vocabulary
• Science Card 3 • IWB Activity 3 • IWB Activity 4 • <i>What Is the Inquiry Process?</i> poster • IWB Activity 5 • Science Card 4 Literacy Place: • <i>Rain</i> (Read Aloud—Changes Inquiry Unit)	• index cards • students' Science Journals • thermometer(s) • coloured markers • masking tape or chalk • notebooks • pictures or videos of weather reports • digital camera (optional)	• Invite an elder, a family member, or a person who works on the sea to tell the class a weather-related story or myth related to your local area or cultural groups.	• cloudy • foggy • heat • noon • raining • shadow • snowing • sunny • weather • windy

Safety

- Provide students with shatterproof thermometers and supervise them closely when they handle the thermometers.
- Review school safety rules before students go outside for an investigation.

Science Background

- In general, the temperature at Earth's surface is lowest just before sunrise, rises in the morning, peaks in the late afternoon, and then decreases. After sunrise, the increase in sunlight gradually heats Earth's surface and its temperature increases. At noon, the sun's rays are most intense. However, it takes several hours for Earth's surface to heat up, so the maximum daily temperature is usually between 3–5 p.m. Changes in cloud cover and weather events can change this pattern on a particular day.
- The primary cause of weather is the uneven heating of Earth's surface and atmosphere by the sun's energy. This uneven heating is due to variations in the amount and location of incoming solar energy during the day-night and seasonal cycles, as well as Earth's tilt and differences in Earth's surface (e.g., land versus water). Weather changes as convection currents in the atmosphere and oceans redistribute the heat.

ACTIVATE

Weather



Add “weather” to the Word Wall. Ask students to tell you what the weather is like today. Then, show Science Card 3. Have students answer the title question: *What is the weather?* and name or describe the weather shown in each picture. Add weather terms to the Word Wall (for example, “snowy,” “rainy,” “windy,” “sunny”). Link to previous learning by asking questions about the pictures that are related to the seasons and the sun. For example, ask:

- **What season do you predict this is? Why?**
- **Does every day in that season have this weather?**
- **Do we get this weather in any other season?**

Ask students what they would wear in each type of weather and have them explain their answers. Offer funny, inappropriate clothing choices such as wearing a bathing suit in the snowstorm. Ask students if that is a good choice and why they think so. Connect students' responses to the question *How can you keep safe?* by asking what would be a better choice of clothing for this weather. Expand the discussion to include behaviours that contribute to safety, such as putting on sunblock or staying outdoors for only a short time.

Link the weather shown on Science Card 3 back to students' knowledge of the sun. Ask:

- **Is it bright or dark? Is it warm or cold?**
- **Where is the sun in this picture?**

Invite students to communicate any weather-related experiences they have had.

IWB Activity:

- Challenge students to match the weather photos with the corresponding weather words using Activity 3: *What's the weather?* (see the Teacher's Website).



Wild Weather

Invite an elder, a family member, or a person who works on the sea to tell the class a weather-related story or myth related to your local area or cultural groups. Students can share their understanding by acting out the story or drawing a picture to show the events. Alternatively, work as a class to create a story book relating the main points of the story. If possible, give a copy to the guest speaker to thank them.

CONNECT

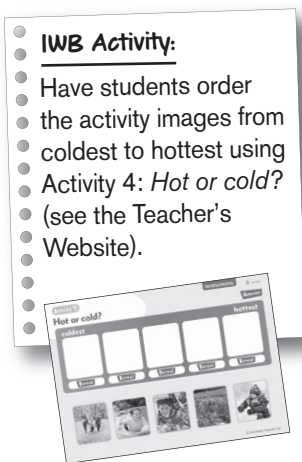
My Birthday Weather

Write the months of the year on index cards. Work with the class to put them in order using a chart or by attaching them to the wall.

Ask students to tell you the month of their birthday. Then, have them write the month on a piece of paper and draw a picture to show what the weather was like on their last birthday. Display students' drawings in the classroom, grouping them according to months. Tell students to look at all the drawings from a month of your choosing, then ask:

- Did everyone have the same weather on their birthday in this month?
- What kind of weather did most people have? Was it hot or cold? Was it bright or dark?
- What season is this month in?

Repeat for another month in a different season.



CONSOLIDATE

Does the Temperature Change Over a Day?

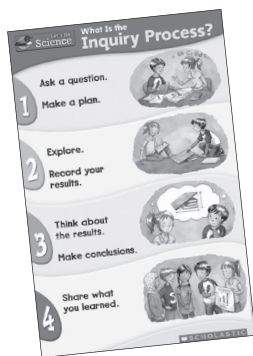
Tell students they are going to follow the inquiry process to answer the question:

- Is the temperature outside the same all day?

(If students are ready, invite them to ask their own question about the temperature outside and guide them in exploring it using a thermometer.)

Remind students of their experience with the inquiry process by having them look over their Science Journals or the posted results from the activity *Sun and Heat* (see pages 24–25). Review the steps on the *What Is the Inquiry Process?* poster. Tell the class that your plan to explore this question is to measure the temperature in the same spot in the schoolyard in the morning, at noon, and in the afternoon. Show the class a thermometer with a white card taped to it and three coloured markers. Ask:

- Who knows a way to record the results? Does anyone have other ideas?



As a class, brainstorm ways to record the results, reminding students that they will have three separate results. Alternatively, tell students that your plan is to mark the height of the liquid in the thermometer using a different colour for morning, noon, and afternoon.

Divide the class into small groups and provide a white card to each group. Have the students write their names on one side of the card. Then, tape the cards to a thermometer. (If you have only one thermometer, you can change cards during the activity.) Review any safety rules and go as a class to the schoolyard. Bring the thermometers, cards, markers, masking tape or chalk, notebooks, and/or a digital camera with you.

Allow each group to choose a location to measure temperature. Direct students to mark the location with masking tape or chalk. Choose and mark a location for yourself. If possible and safe, allow students to use a thermometer and mark the cards themselves. Otherwise, hold the thermometer for each group and have a volunteer mark the card. (Or, you may choose to take digital photos of the thermometer readings.) Measure and record your own data. As students are working, prompt observation of factors which affect the amount of sunlight by asking questions such as:

- **Where is the sun now? Are there any clouds?**
- **Do you notice anything about the light? Is it bright or dark?**
- **Is it warm or cool? Where does the heat come from?**
- **Is there shade in your location? Was there shade there before?**
- **Where is your shadow? Is it in the same place as before?**
- **What is the weather like now? Do you think it will stay the same all day?**

Challenge students to find a way to record their observations about the sun, shade, shadows and weather using the tools you brought with you (i.e., notebooks and/or digital camera). Have the students collect temperature data and related observations twice more during the day. Use a different colour of marker at each time.

Create a chart with the headings “Morning,” “Noon,” and “Afternoon.” Have each group communicate the temperature which is highest, lowest, and in the middle at their location. Record this on the chart, then ask questions such as:

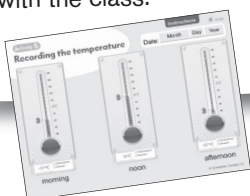
- **Was it warm or cool in the morning?**
- **What about the temperature at noon? Did the temperature go up or down?**
- **Did you observe any changes in the weather? How about shade?**
- **Did your shadow change during the day? How?**

As a class, brainstorm an answer to the initial question posed based on their results. Ask:

- **What conclusion can we make from our results? Can we answer our question?**

IWB Activity:

- You may choose to use Activity 5: *Recording the temperature* (see the Teacher's Website—clone this slide to make multiple copies) to help students to record their outdoor temperatures from the morning, noon, and afternoon. Print and compare the various temperature readings with the class.





During the discussion, ask students to explain how they arrived at their answer(s). Model and encourage generating new questions based on the exploration by asking questions such as:

- **I wonder if it is warmest in the afternoon in the summer, too?**
- **I wonder if we would have observed the same thing if the weather had [stayed the same/changed]?**
- **I wonder why my shadow changed?**
- **What do you wonder about now?**

Record students' new questions on the I Wonder Wall. As a follow-up, consider inviting students to explore their questions. Provide tools for measuring and recording, books, websites, and any other materials and resources as required.

Note: On a cloudless day without a weather change, the air temperature will be low in the morning, rise until around 3–5 p.m., and then fall and stay low until the next sunrise. Actual results will depend on local weather conditions, such as cloud cover. If students do not observe this temperature pattern, you might share previously prepared results from a cloudless day. You might also have students repeat the measurements on days with different weather to make further comparisons (e.g., a sunny versus a cloudy day).

Sun and Seasons

Direct students to create a drawing or collage that shows how the temperature and light change from winter to summer. As they are working, prompt students to consider the different types of weather they would expect in each season when thinking about the temperature. Make an art gallery of students' work in the classroom.

Predicting Weather

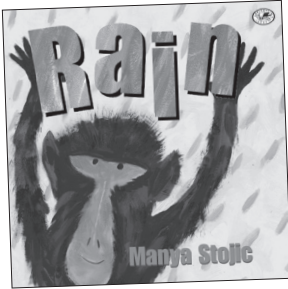
Tell the class that they are going to be a weather-person (meteorologist) on the news. Ask students to communicate their understanding of what a weather-person does. Share pictures or videos of weather reports and point out any charts that are used. Ensure students understand the basic factors that make up a weather report: temperature (qualitative only), precipitation (rain, snow, etc.), and general light (sunny, cloudy). Then, divide the class into small groups and tell students that each group is to predict the weather for tomorrow.

Circulate among the groups to provide guidance as needed. Ask:

- **How would you tell people about the weather we have today?**
- **Do you think the weather will be the same tomorrow as it was today? Why?**
- **What season is this? What other kind of weather might we get in this season?**

If possible, view as a class weather data from your school's weather station or online interactive weather maps.

Provide stationery items, scissors, glue, and other craft material to each group. Direct the students to decide how they will present their predictions to their classmates. Students may need guidance in assigning roles to create and present predictions.

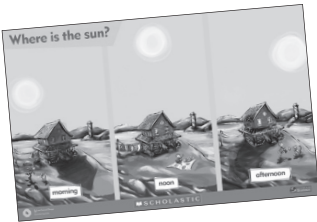


Literacy Place Connection:

Revisit or read *Rain* by Manya Sojic, in which various African animals describe how a thunderstorm transforms their environment. Discuss with the students what changes took place. Ask:

- What was the environment like at the beginning of the story?
- How did it change after the rain came?
- What was it like at the end of the story?
- Do you think the rain will come again? How is this a cycle?

EXPLORE MORE



Follow the Sun

Working in small groups, have students use a digital camera to take pictures of the position of the sun relative to a schoolyard landmark from the same place throughout the day. The landmark can be any object against which the relative height of the sun can be judged. Before students take any pictures, ensure they understand they are not to look directly at the sun (you may prefer to take the photographs yourself). After each picture is taken, ask students to predict whether the sun will be higher or lower in the next picture. When all pictures have been taken or after viewing the card, have students describe how the position of the sun changed over the day. (If there is no visible sun, share Science Card 4 instead.) Guide students to consider how the sun's position in their photos or on Science Card 4 is related to heat and light by asking questions such as:

- When was the sun lowest? highest? Was it warmer or colder then?
- Do you see as well in the afternoon as you do at noon? Why?