

Lesson 2: Temperature and Seasons

☐ Getting Started

The temperature measures how hot or cold it is outside. Think about what the temperature tells you about the weather. If you understand what different temperatures mean, you can determine what to wear or whether different outdoor activities will be fun. Thermometers measure temperature.

If you need to review how to use a thermometer to measure temperature, you can watch the video at the following web link. If you already know how to read a thermometer, you can bypass the video.



How to Read a Thermometer

www.beyondthepage.com/link/13224/

Put a thermometer in a cup of ice water. What is the temperature? Now, put the thermometer in a cup of tap water straight out of the sink. Leave it for a minute or two. Did the temperature go up or down? What is the temperature? Now, boil some water (ask a parent for assistance) and turn off the stove when the water starts bubbling. Put your thermometer in the pot. What is the temperature now?

There are many factors in the environment that influence the outside temperature we experience in our environment on a daily basis. One of these factors is the Sun.

Stuff You Need

- "Weather Words" booklet (kit)
- *Weather and Climate* by Kathleen M. Reilly
- cup of ice water
- cup of tap water
- globe or large ball
- lamp with a removable shade
- small pot of boiling water
- stapler
- string (kit)
- thermometers (kit)

Ideas to Think About

- What factors in the environment affect temperature?
- What cycles on Earth impact the temperature and the seasons?

Things to Know

- The Sun has a major influence on the weather.
- The wind influences the temperature in the environment.

- See the "Weather Words" booklet for definitions of the following words: temperature, thermometer, evaporate, heat index, wind chill, water vapor.

☐ Reading and Questions

Read pages 8-15 in *Weather and Climate*, and then answer the questions. As you read, fill in the definitions for the "Lesson 2" section of your "Weather Words" booklet.

1. What scale do we use to measure temperature in the United States?

2. How can high humidity in the air impact the temperature outside?

3. What can the wind do that affects how the temperature feels outside?

4. What season is it when the place you live on Earth is tilted toward the Sun?
What season is it when the place you live on Earth is tilted away from the Sun?

Activities

☐ Activity 1: Seasons

In each of the two diagrams on the "Seasons" page, put a point on the globe where you live. Circle whether your home is angled toward or away from the Sun in each picture. Label the season you would experience (summer or winter) in each picture based on where you live on the planet.

☐ Activity 2: The Sun's Rays

You know that the part of the Earth angled toward the Sun experiences summer, and the part of the Earth angled away from the Sun experiences winter. Just like the angle of the Earth affects the temperature, where the Sun's rays hit the Earth also affects the temperature of a region.

Do the "Model the Seasons" activity on page 20.

☐ **Activity 3: Start a Weather Journal**

On the "Weather Journal" activity pages, you will record information about your local weather every day for two weeks. (The gray boxes indicate weather factors that you don't need to fill in yet.) Find all four pages and staple them together. The first measurement you will add to your journal is today's temperature. To take the temperature outdoors, do the following:

- Place a thermometer in an area outside where it can measure the air temperature but isn't in direct sunlight. (Try attaching some string to the thermometer and hanging it from a tree branch in a shady area.)
- Give the thermometer at least five minutes to register the temperature before you take a reading. Temperatures in the United States are usually recorded in Fahrenheit, which is marked on a thermometer with F.
- Read the temperature in Fahrenheit and add it to your journal.
- Choose a regular time of day to record the temperature, if you can, since the temperature first thing in the morning is different than the temperature in the middle of the day.
- If the thermometer is securely attached and in the shade, you can leave it outside. (You may want to bring it in during severe or windy weather, though.)

You will also begin to track whether it rains or snows. Write this down in the "Precipitation" column, as well as more specific information about the day's precipitation (for example, if it rained, you could note whether it was a brief shower, a heavy thunderstorm, or steady rainfall most of the day). The "Notes/Forecast" column is a place for you to record any other interesting weather details and to begin making your own weather predictions. Add any details about today's weather that you found interesting. Tomorrow, you will begin making your own forecasts.

Wrapping Up

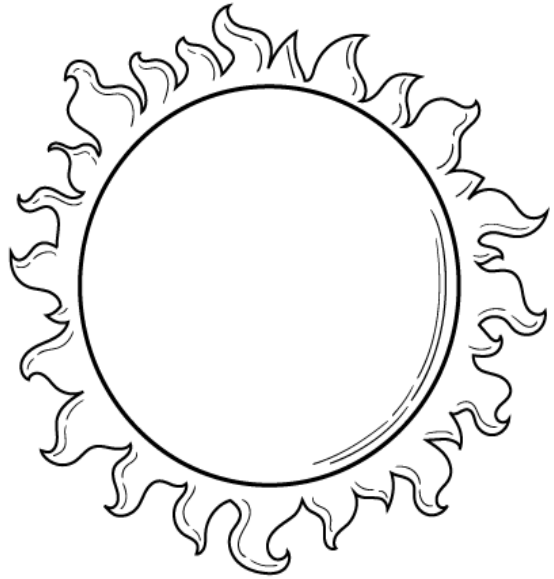
Watch the following video. The video explains why we have the weather we experience on Earth.



4 Reasons Why We Have Weather

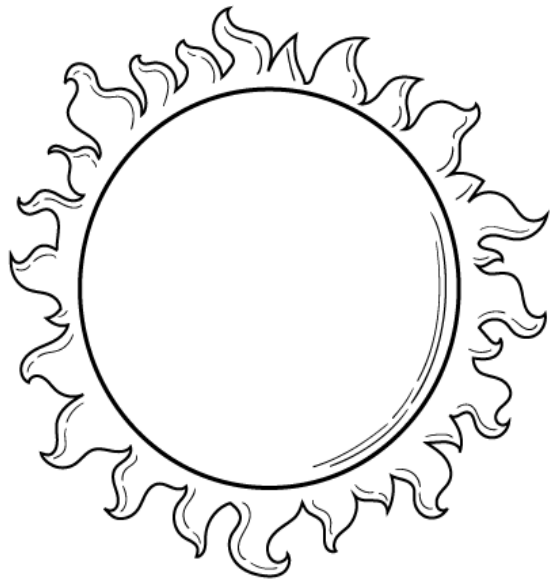
www.beyondthepage.com/link/13225/

SEASONS



Your home is angled toward / away from the Sun.

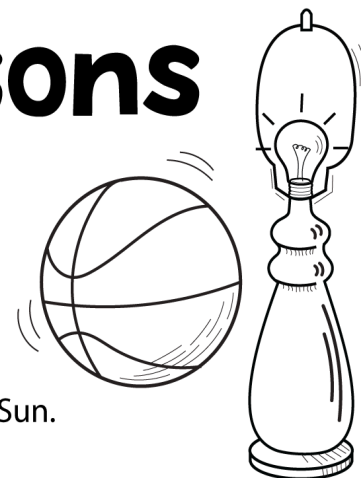
What is the season? _____



Your home is angled toward / away from the Sun.

What is the season? _____

Model the Seasons



MATERIALS YOU'LL NEED:

- Globe or large ball (to represent Earth)
- Lamp with the shade removed (to represent the Sun)

INSTRUCTIONS:

1. Place the lamp in the center of a table or on the floor. This will be your Sun.
2. Stand the globe/ball a few feet away so the light shines on one side.
3. Slowly tilt the top of the globe toward the lamp and notice which parts get more direct light.
4. Now tilt the top of the globe away from the lamp and see which parts are less bright.
5. Try turning the globe slowly to see how different parts of Earth get light during a day.

QUESTIONS:

When the top of the globe is tilted toward the Sun, what season is it in that half of the world? _____

When the top of the globe is tilted away from the Sun, what season is it in that half of the world? _____

Where on Earth are the Sun's rays most direct? _____

What is the temperature usually like in this area? _____

Where on Earth are the Sun's rays least direct? _____

What is the temperature usually like in these areas? _____

DRAW IT!

Draw a simple picture of your globe and lamp setup.

- Label:
- ☐ Sun (lamp)
 - ☐ Equator
 - ☐ North Pole
 - ☐ South Pole
 - ☐ Direction of tilt for summer and winter



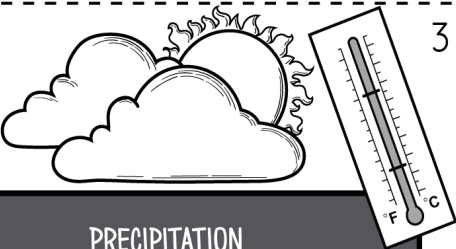
Weather Journal

DAY #	DATE	TEMPERATURE (°F)	WIND SPEED + DIRECTION	AIR PRESSURE (MB OR IN)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

Weather Journal

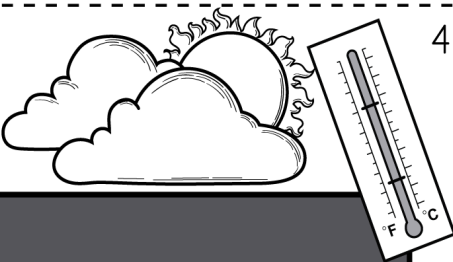
DAY #	WIND CHILL	FROSTBITE RISK	RELATIVE HUMIDITY	HEAT INDEX	HEAT STROKE RISK
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					

Weather Journal



DAY #	CLOUD DESCRIPTION	PRECIPITATION
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		

Weather Journal



DAY #	NOTES/FORECAST
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	

Lesson 2: Temperature and Seasons

Getting Started

✿ Ideas to Think About

- What factors in the environment affect temperature?
- What cycles on Earth impact the temperature and the seasons?



Things to Know

- The Sun has a major influence on the weather.
- The wind influences the temperature in the environment.
- See the "Weather Words" booklet for definitions of the following words: temperature, thermometer, evaporate, heat index, wind chill, water vapor.

⦿ Skills

- Recognize that weather and climate are influenced by interactions involving sunlight and these interactions vary with latitude and altitude. (S)
- Predict weather conditions and patterns based on information obtained from weather data collected from direct observations and measurements. (S)
- Model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the Sun, causing changes in seasons. (S)
- Identify the role of natural events in altering Earth systems. (S)
- Recognize cycles within Sun, Earth, and Moon systems that impact the seasons and the tides. (S)
- Describe how energy from the Sun, hydrosphere, and atmosphere interact and influence weather and climate. (S)

Introducing the Lesson

Today, your child will explore how temperature affects the weather and how the seasons change throughout the year. She will learn how the Sun's energy influences temperature, how to measure temperature using a thermometer, and how wind and humidity can change how hot or cold it feels outside. Through hands-on activities, she will track daily temperature changes, investigate how the tilt of the Earth creates seasons, and start a weather journal to record her observations. By the end of this lesson, she will better understand how temperature shapes the weather and our daily lives.

As your child does today's reading, she will fill in the definitions for the "Lesson 2" section in her "Weather Words" booklet. Her definitions should be similar to the following:

- temperature: how hot or cold a thing is, measured in degrees
- thermometer: an instrument that measures temperature
- evaporate: to change from a liquid into a gas
- heat index: how hot it feels due to both temperature and humidity
- wind chill: how cold it feels due to both temperature and wind speed
- water vapor: water that has become a gas

Reading and Questions

1. What scale do we use to measure temperature in the United States?

Fahrenheit

2. How can high humidity in the air impact the temperature outside?

High humidity can make the temperature feel hotter.

3. What can the wind do that affects how the temperature feels outside?

It can make it feel colder outside if the wind is blowing.

4. What season is it when the place you live on Earth is tilted toward the Sun? What season is it when the place you live on Earth is tilted away from the Sun?

summer; winter

Activities**Activity 1: Seasons**

Answers (summer or winter) will vary depending on where you live on the planet.

Activity 2: The Sun's Rays

After your child completes the activity, ask these follow-up questions.

- Where on Earth are the Sun's rays most direct? (the equator)
- What is the temperature like on the equator? (warm)
- Where on Earth are the Sun's rays least direct? (the North and South Poles)
- What is the temperature like at the poles? (very cold)
- How would your life be different if you had only one season where you live?

Activity 3: Start a Weather Journal

Your child will begin a weather journal today, recording the temperature and any precipitation. Help her find a good spot outside to hang the thermometer. As she completes more lessons, she will also begin tracking other factors that influence the weather. She will enter information into her weather journal for 14 days.

Even though temperature information is readily available to us today, encourage your child to set up and read the thermometer herself. She may notice that the reading on her thermometer is different than the reading she sees on weather forecasts. If she does, talk about why that might be. Weather sites typically get their data from automated weather stations and from the personal weather stations of trained weather watchers. However, many factors influence local weather conditions. The temperature measurements used by your local weather stations could be miles from your child's thermometer and could be taken under different circumstances (at a different elevation, in a more protected location, etc.).

Wrapping Up**Questions to Discuss**

- How does temperature affect the weather? (Answers may vary. Temperature is part of our daily experience of weather, such as whether it is a hot or cool day. It determines the type of precipitation that falls. It also causes changes in air pressure.)
- What types of jobs might be affected by the temperature and how are they affected? (Answers will vary.)
- Point to a place on the globe/map where it is most likely to be warm. Now point to a place it is most likely to be cold. Explain why. (They should point to a place near the equator for warm and near the poles for cold. The sun's rays shine most directly near the equator.)
- If you live in a city that is tilted toward the sun, what season will it be in your city? (summer)

Things to Review

Discuss that the seasons are determined by the Earth's tilt toward or away from the sun. Review that the temperature tells us how warm or cool a place or thing is. Explain that temperature impacts the weather we experience. Knowing the temperature helps us decide what we should wear each day and what types of activities we should engage in.