

A large, stylized illustration of the Earth in shades of green, yellow, and blue, with a hatched texture. It is positioned on the right side of the page, partially behind the text.

EARTH



DAY

EXPLORERS

Toolkit



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Extension

Table of Contents

Grades PK-2:

Weather Affects Plans

Part 1 _____ 3

Table 1 - Weekly Weather Chart _____ 5

Weather Affects Plans

Part 2 _____ 4

Table 2 - Dressing for the Weather _____ 6

Grades 3-5:

Water (H₂O) _____ 7

Figure 1 - The Water Cycle _____ 8

Soil Erosion

Part 1 - Water _____ 9

Part 2 - Wind _____ 10

Grades 6-8:

Weather Or Climate? _____ 12

Table 4 - Weather or Climate _____ 13

Soil Needs Its Space _____ 14

Table 5 & 6 - Water and Soil _____ 16

Extra Worksheets

Weather Word Search _____ 17

Weather Word Scramble _____ 18

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Weather Affects Plans

Grades: Pre K - 2nd

Weather Science



Activity Description

Knowing the weather forecast before you leave home every day is helpful. If rain is expected, you should wear a raincoat or take an umbrella. If it is very hot, take a bottle of cold water. If it is cold, you'll probably wear a warm coat with a hat, boots, and mittens or gloves. In this activity, you will collect weather data and list the outdoor activities you can do with each weather forecast.

Weather Affects Plans (Part 1)

The Question: *How does the weather affect your plans?*

What you will need:

- Your choice of local weather report (i.e. TV, radio, or Internet)
- Weekly Weather Chart (Table 1, page 5)

Explore:

1. Use a weather report to obtain the local high and low temperatures each day for one week.
2. Record the temperatures in columns 2 and 3 in the Weekly Weather Chart (Table 1).
3. Indicate if you had any precipitation in your local area (columns 4-6).
4. List any outdoor activities that you did each day (column 7).

Share:

- What was the highest temperature during the week?
- What was the lowest temperature during the week?

Apply:

- Did the weather affect your outdoor activities? Why or why not?
- When has the weather affected your family's plans?
- What affect does the weather have on...
 - Vacation plans?
 - Building a house?
 - Walking a trail or hiking?

Weather Affects Plans

Grades: Pre K - 2nd

Weather Science



Activity Description

Imagine that you will spend the day outside today. Look at or listen to today's weather report and choose the clothes you will wear from the list of clothes given (Table 2, page 6).

Weather Affects Plans (Part 2)

The Question: *How does the weather affect what you wear?*

What you will need:

- Your choice of local weather report (i.e., TV, radio, or Internet)
- Weekly Weather Chart (Table 1, page 5) one for each classroom to share or one for each student.
- Dressing for Weather (Table 2, page 6) for each student
- Crayons, 2 colors per student

Explore:

1. Using the Table 2 look at all the different types of clothes you might wear depending on the weather.
2. Using one color crayon, circle all the clothes you might wear outside today to be comfortable in the weather.
3. Using the other color crayon, circle all the clothes you might wear outside on Thanksgiving Day to be comfortable in the weather.

Tip: If you have extra time, you may have the students draw a picture of themselves outside in today's weather and on Thanksgiving Day.

Share:

- Did you pick what you are wearing today based on the weather?
- Do you have clothes in your closet you don't wear very often right now because of the weather?
- What are some qualities of the clothing you are wearing now?
- Have you ever had the material qualities of your clothing change? (like getting holes, or getting too small or thin or cracked) What happened?

Apply:

- If you lived where it is warm most of the year, like Florida, what would be different about the clothes you own?
- What if you lived in a cold place like Alaska? What do you think your closet would be filled with?
- What could you use/design to help protect your skin from sunburn?
- It can be dangerous if we get sweaty while playing outside in the snow. The same insulation that keeps us warm, traps our sweat, and we get wet and cold. What could we do to prevent this problem?

**Table 1.
Weekly Weather Chart**

	Temperature		Precipitation				Outdoor Activities
	High	Low	Rain	Snow	Other		
SUNDAY							
MONDAY							
TUESDAY							
WEDNESDAY							
THURSDAY							
FRIDAY							
SATURDAY							

Table 2.
Dressing for the Weather

 T-Shirt	 Shorts	 Gym Shoes
 Tank Top	 Jeans or Long pants	 Snow Boots
 Long-sleeve shirt	 Heavy socks	 Light Jacket
 Sweatshirt	 Light socks	 Raincoat
 Hoodie	 Sandals	 Winter coat
 Swimsuit	 Flip-Flops	 Hat and Gloves

Water H₂O

Grades: 3rd - 5th

Weather Science



Activity Description

Water is important for all life on Earth. It plays a big part in determining the weather. Water has three forms: solid, liquid, and gas. Water on earth's surface evaporates into the air as a gas, forms clouds in the sky, and creates precipitation. It might be snow, rain, or water vapor. When water falls from the sky as rain, it can soak into the ground. It can run along the surface to form streams and rivers. It can collect in low areas and form ponds and lakes. It can travel to the ocean. Plants, people, and other animals also use water. During all of these possible journeys, the water can evaporate back into the air, and what we call the water cycle starts all over again.

The Question: *What causes water to condense out of the air?*

What you will need:

- Two glass jars with lids (about pint-sized)
- Water
- Ice Cubes
- The Water Cycle - Figure 1, page 8

Explore (Part 1):

1. Fill a jar with water at room temperature and put a lid on it.
2. Fill the second jar with ice cubes. Then, completely fill the jar with cold water. Put the lid back on.
3. Observe the two jars for about 5 minutes.

Share:

- On what jar did water condense on the outside?
- Where do you think the condensed water came from?
- Why did water only condense on the jar with the ice cubes?

Water H₂O

Grades: 3rd - 5th

Weather Science

Explore (Part 2):

1. Take the first jar, the one without ice, and empty most of the water. Leave about 1/2 inch of water in the bottom of the jar.
2. Put on the lid, and shake the jar for a full minute. This will force water to evaporate in the jar.
3. Set the jar down, and leave it alone for another minute.
4. Observe what the jar looks like.
5. With the lid on tight, hold the first jar sideways over a sink.
6. Carefully pour the ice water from the second jar down the side of the first jar.
7. Observe the inside of the first jar.

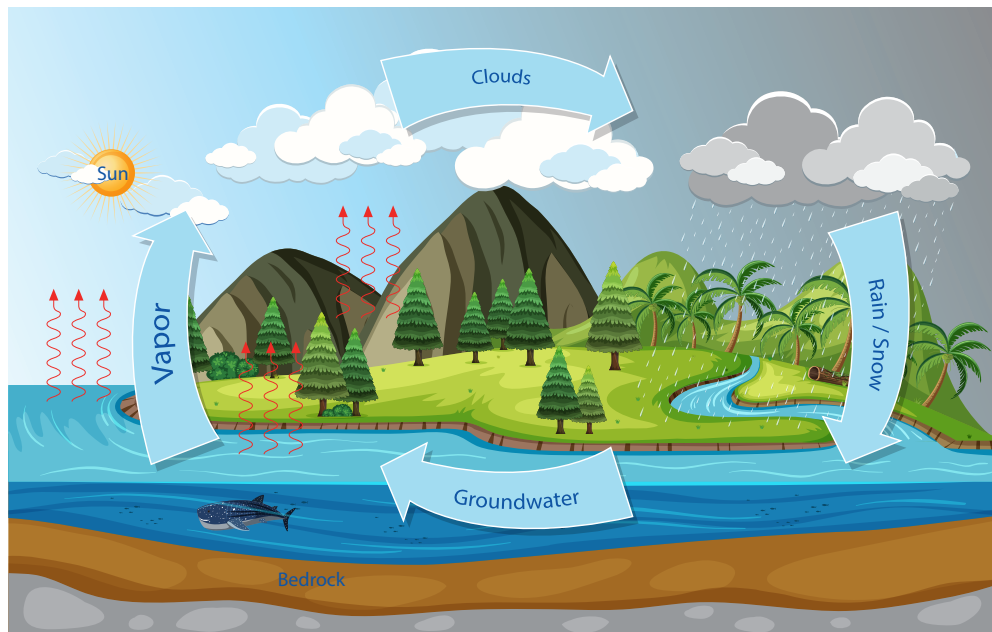
Share:

- What did you observe on the inside of the jar at each step?
- What happens to the temperature of the air when water condenses?

Apply:

- Study the picture of the water cycle in Figure 1 below. How does what you learned about precipitation relate to the water cycle?
- When does dew form?
- When does frost form?
- Would you ever expect dew or frost to form when things are warming up?
- Have you ever watched clouds on a sunny day? What do they look like?

The Water Cycle
Figure 1.



Soil Erosion

Grades: 3rd - 5th

Soil & Weather Science

Activity Description:

Soil erosion is the wearing away of land surface by water, wind, or ice. Geologic erosion happens slowly over time. Accelerated erosion happens much faster, and human activities usually cause it. Water and wind cause most of the erosion in the Midwest. Water erosion occurs when raindrops hit soil particles hard enough to dislodge them and wash them downslope. Wind can also dislodge soil. In this activity, you will demonstrate how soil erosion occurs by water and wind.

The Question: *Why are we losing topsoil?*

What you will need (Part 1):

- Small shallow box lined with plastic or a two-liter bottle cut in half
- Soil from a garden or flower bed
- Heavy-duty aluminum foil to make a spout
- Sprinkling can, at least 1 quart; half gallon is better
- Wide-mouth quart canning jar
- Book or piece of wood about 1 inch thick.

Tip: These activities are best done outdoors or in an easily cleaned area.

Water Erosion (Part 1):



Soil Erosion

Grades: 3rd - 5th

Soil & Weather Science

Explore (Part 1):

1. Line the box with plastic to hold the soil.
2. Fill the box with dry soil from the garden or flower bed.
3. Construct a foil spout to collect water at the end of the box.
4. Set the box on a table with the spout extending over the edge of the table.
5. Place the jar under the spout.
6. Fill the sprinkling can with water.
7. Hold the sprinkling can approximately 1 foot above the box and pour the water steadily.
8. Continue to pour water until the jar is at least half full of runoff water.

Share (Part 1):

- Did the water get washed out of the bottom of the box? If yes, you observed gully erosion; if no, continue...
- Did the water make small channels in the soil surface? If yes, you observed rill erosion.
- Did the water remove a smooth, even portion of the soil without creating small channels? If yes, you observed sheet erosion.

Wind Erosion (Part 2)



Soil Erosion

Grades: 3rd - 5th

Soil & Weather Science



What you will need (Part 2):

- Box from Water Erosion in a Box activity
- Dry soil from a garden or flower bed
- An electric fan or hair blow dryer
- Adhesive tape
- Large cardboard cereal box, at least 12 inches high
- Scissors
- Petroleum jelly
- Books

Explore (Part 2):

1. Fill the box with soil from a garden or flower bed. Remove any clumps in the soil so that it is fine and powdery. It cannot be damp.
2. Construct a soil collector from the cereal box by cutting a window in one side, about 4 inches high and 10 inches wide.
3. Punch a dozen holes about a quarter-inch in diameter in the back of the cereal box to let the wind blow through.
4. Spread a thin layer of petroleum jelly on the inside of the back of the box around the holes.
5. Tape the top and bottom of the cereal box and place beside the soil box with the fan across.
6. Place the soil box on top of a book(s) so the soil is level with the bottom of your window in the cereal box.
7. Place the fan or blow dryer at the opposite end of the cereal box.
8. Turn on the fan or blow dryer and let it run for about five minutes.
9. Observe the soil inside your cereal box.

Share (Part 2):

- Did you observe any wind erosion?
- What do you think would happen to soil during extreme weather such as a tornado?

Apply (Part 1 and Part 2)

- Did you observe more than one type of erosion?
- How might soil erosion be reduced?
- Why do you think preventing soil loss is important?

Weather or Climate?

Grades: 6th - 8th

Weather Science



Activity Description:

People often say climate and weather as if they mean the same thing. They do not. The temperature today is considered part of today's weather, but the average temperature over the last 30 years is considered part of our climate. Weather is the day-to-day changes in the atmosphere and describes a single occurrence, such as the current temperature. An example of weather is a temperature reading of 85 degrees Fahrenheit on the 4th of July. An example of climate would be the average high temperature for your city or town on the 4th of July.

The Question: *What is the difference between weather and climate?*

What you will need:

- Pencil
- One copy of Weather or Climate? (Table 4, page 13) for each student.
- Optional: A resource on weather and climate such as the Internet, a book, or a person.

Explore :

1. You might hear any of the statements in Table 4 on your radio or TV. Read each statement in the first column.
2. Indicate if the statement is an example of weather or climate by placing an X in one of the Example columns (2 or 3)
3. Explain your reason for your answer by placing an X in one of the Reason columns (4 or 5).

Share:

- Did you find it difficult to decide which statements in the Weather or Climate? table concerned weather and which concerned climate?

Apply:

- Are the clothes you are wearing today determined by weather or climate?
- How might climate impact your future?

Table 4.
Weather or Climate?

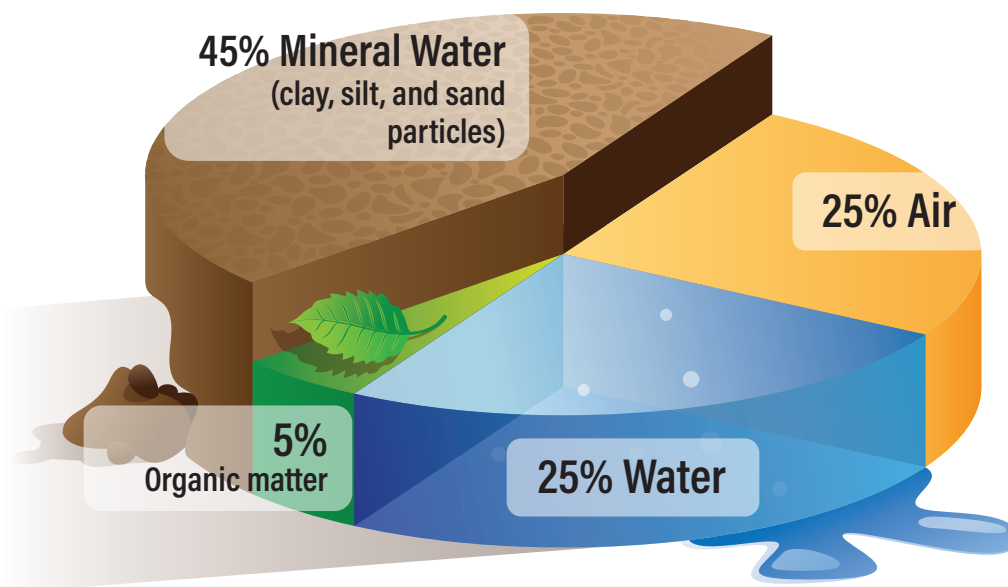
Announcer's Statement	Example		Reason	
	Weather	Climate	Single Occurrence	An Average
Yesterday the high was 55°F and the low was 43°F.				
Today we are expecting a high of 61°F.				
That is 10 degrees above the normal high of 51°F for this date.				
Clear skies today with no rain in the forecast for the next three days.				
We usually would have four inches of rain this month.				
Hurricane season is beginning in the tropics.				
A tropical storm is developing in the Atlantic Ocean.				
To the north, a massive snowstorm is on its way.				
We do not normally see a snowstorm like this at this time of year.				
Tornado season is upon us, and we must be prepared.				
We usually expect four or five tornado outbreaks to occur this month.				
This morning a tornado damaged a building on High Street downtown.				

Soil Needs Its Space

Grades: 6th - 8th

Water & Soil Science

SOIL COMPOSITION



Activity Description:

Soil has four main parts or components. Soil is made of minerals, water, air, and organic matter. Air is in the pore spaces between soil particles. In this activity, you will investigate how water can fill pore spaces in the soil.

The Question: *Where does rain go when it enters the soil?*

What you will need:

- Clear jar or container with lid; a quart canning jar works well
- Second container to hold water such as a cup or another jar
- Masking tape
- Water
- Dry soil (dig about two cups from your yard or garden; do not dig after rainfall)
- Ruler
- Pen or pencil
- A copy of Tables 5 & 6 on page 16 for each student

Soil Needs Its Space

Grades: 6th - 8th

Water & Soil Science



Explore (Part 1):

1. Measure the height of your jar, calculate half the height of the jar and put a piece of tape on the jar at the halfway point.
2. Add water to the top of your tape so that the jar is half full.
3. Pour out the water into a separate container and save it.
4. Add dry soil to the top of your tape.
5. Record the dry soil height in Table 5.
6. Slowly pour the saved water back into the jar of soil.
7. Wait 10 minutes to give the water time to enter the soil.
8. Record the height of the soil and water in Table 5.
9. Calculate the pore space in your soil (water + soil height - dry soil height = pore space)

Explore (Part 2):

1. Using the same jar from Part 1 (with soil and water in it) add water to fill the jar to the top.
2. Put the lid on the jar and shake it vigorously for 10-20 seconds.
3. In Table 6, draw and describe what you see.
4. Place the jar where it can remain undisturbed.
5. In Table 6, page 16 draw and describe what you see after each period.

Share:

- Was there a difference in the height of the water and the water/soil mixture? How would you explain that?

Apply:

- Why do you think it's important for soil to have pore space?
- How could a pollutant spilled on the grass be transported to our drinking water supply?

Soil Needs Its Space

Grades: 6th - 8th

Water & Soil Science



Table 5. Soil and Water Investigation		
Measurement	Height (in inches)	
a) Dry Soil Height		
b) Water + Soil Height		
c) Pore Space ($b-a=c$)		

Table 6. What I See		
Time (hours)	Picture	Description
0		
1		
3		
24		

Weather Word Search

q	u	i	t	j	h	u	h	f	r	l	p
a	f	u	h	k	g	y	i	e	t	o	z
z	o	i	u	b	l	i	z	z	a	r	d
w	g	k	n	l	f	c	o	v	g	t	x
s	n	l	d	p	d	e	p	w	d	i	c
x	b	o	e	o	s	t	a	c	i	k	v
c	g	p	r	i	a	r	z	d	n	n	b
f	l	a	s	h	f	l	o	o	d	m	d
d	t	j	t	u	q	w	x	e	h	j	n
e	r	v	o	t	o	r	n	a	d	o	m
r	f	w	r	y	s	e	s	w	y	u	l
f	v	e	m	z	w	i	n	t	e	r	k

- blizzard
- heat
- tornado
- flash flood
- ice
- wind
- fog
- thunderstorm
- winter

Weather Word Scramble

Word bank:

- air
- wind
- earth
- temperature
- clouds
- weather
- heat
- hail
- humidity
- snow
- sun
- climate
- water

Scrambled Letters	Weather Word	My Definition
ahrewet		
rai		
tarew		
athe		
miudtihy		
nsu		
herta		
nwid		
nswo		
nria		
lhia		
scoldu		
ateuprmeet		
etamilc		