





# Day 1

## Weather, seasons, and climate

### Introduction

Weather changes from day to day. Some days are sunny; others are windy, cloudy, or snowy. Seasons change throughout the year, affecting the weather. People try to predict the weather so they'll know what to wear, how they should plan their day, or if it's safe to travel. People might choose to live in a place because of the [climate](#) — or the average weather patterns over the years.

Scientists describe [weather](#) as the state or condition of the atmosphere. The [atmosphere](#) is the “air” we breathe and a mix of gases held in place around the planet by gravity. So, weather is what is happening in our atmosphere. Climate is the average weather conditions over a long time, like 30 years.

Climates change more slowly than weather. [Climate change](#) is when the typical weather in a region changes over a long period of time. For example, the average temperature or rainfall could change. Scientists have noticed that the Earth is getting warmer. That means climates all over the Earth are changing.

[Seasons](#) are periods of the year distinguished by special climate conditions. Some places on Earth experience four seasons: winter, spring, summer, and fall. Near the equator, they experience two seasons: rainy and dry.

Activities for this day help kids to understand how we experience weather, climate, and the seasons all at once! Your weather may change every day. Your season changes two to four times a year, depending on where you live.

### Questions to guide explorations and experiments

- What is weather?
- What is precipitation?
- What are clouds? What kinds of clouds are there?
- What are seasons?
- What makes the seasons change/happen?
- Why is winter cold and summer hot?
- What is climate?
- What is climate change?
- How do mountains or oceans affect weather?

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### Books and activities

- **Books:** all about weather, climate, and seasons
- **Activities:** explore precipitation and seasons, take a Weather Walk

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### Water basics

If your kids need a refresher in water basics (the states of matter and the water cycle), [see pages 33-37](#). You'll find books, a simple activity, and a list of water words.



## Children's Books

### Fiction

- *A Busy Year* by Leo Leoni (Ages 3-6)
- *Busy Spring: Nature Wakes Up* by Sean Taylor and Alex Morss (Ages 5-8)
- *Días y días / Days and Days* by Ginger Foglesong Guy (Ages 3-8)
- *Frog and Toad All Year* by Arnold Lobel (Ages 3-8)
- *If Winter Comes, Tell It I'm Not Here* by Simona Ciruolo (Ages 4-8)
- *It Looked Like Spilt Milk* by George Shaw (Ages 4-8)
- *Leaf Man* by Lois Ehlert (Ages 4-8)
- *Little Cloud* by Eric Carle (Ages 3-6)
- *Lola Shapes the Sky* by Wendy Greenley (Ages 4-8)
- *The Longest Night* by Marion Dane Bauer (Ages 6-9)
- *Mouse Seasons* by Leon Leoni (Ages 3-7)
- *My Awesome Summer* by P. Mantis by Paul Meisel (Ages 4-8)
- *My Happy Year* by E. Bluebird by Paul Meisel (Ages 4-8)
- *Rain* by Manya Stojic (Ages 3-7)
- *Rain Play* by Cynthia Cotton (Ages 4-6)
- *Seasons* by Hannah Pang (Ages 3-8)
- *Summer Green to Autumn Gold: Uncovering Leaves' Hidden Colors* by Mia Posada (Ages 5-9)
- *This Beautiful Day* by Richard Jackson (Ages 3-6)
- *Wild Summer: Life in the Heat* by Sean Taylor and Alex Morss (Ages 5-8)
- *Winter Sleep: A Hibernation Story* by Sean Taylor and Alex Morss (Ages 5-8)
- *Wolf in the Snow* by Matthew Cordell (Ages 3-6)

### Poetry

- *Snow Birds* by Kirsten Hall (Ages 6-9)
- *Snowman – Cold = Puddle: Spring Equations* by Laura Purdie Salas (Ages 4-8)
- *Weather: Poems for All Seasons* by Lee Bennett Hopkins (Ages 3-6)
- *Watersong* by Tim McCanna (Ages 3-6)
- *Winter Friends* by Mary Quattlebaum (Ages 3-7)



## Children's Books

### Nonfiction

- *All the Water in the World* by George Ella Lyon (Ages 3-8)
- *The Cloud Book* by Tomie de Paola (Ages 4-8)
- *Clouds (National Geographic Explore My World)* by Marfe Delano (Ages 3-7)
- *Clouds* by Anne Rockwell (Ages 3-7)
- *Down Comes the Rain* by Frank Branley (Ages 5-9)
- *A Drop of Water* by Walter Wick (Ages 6-9)
- *Everything Weather (National Geographic Kids)* by Kathy Furgang (Ages 8-12)
- *It's Raining* by Gail Gibbons (Ages 3-8)
- *Look at the Weather* by Britta Teckentrup (Ages 6-9)
- *On the Same Day in March* by Marilyn Singer (Ages 5-7)
- *One Well: The Story of Water on Earth* by Rochelle Strauss (Ages 9-12)
- *The Reasons for the Seasons* by Gail Gibbons (Ages 4-8)
- *Red Leaf Yellow Leaf* by Lois Ehlert (Ages 4-8)
- *The Science of Weather: The Changing Truth About Earth's Climate* by Ian Graham (Ages 8-12)
- *See Inside Weather and Climate* by Katie Daynes (Ages 4-8)
- *Snow is Falling* by Frank Branley (Ages 3-8)
- *Water (National Geographic Readers)* by Melissa Stewart (Ages 7-9)
- *Water Is Water* by Miranda Paul (Ages 3-6)
- *Weather and Climate* by Joe Greek (Ages 6-10)
- *Weather* by Seymour Simon (Ages 6-10)
- *Weather Words and What They Mean* by Gail Gibbons (Ages 6-9)





# Activity 1: Cloud in a Jar

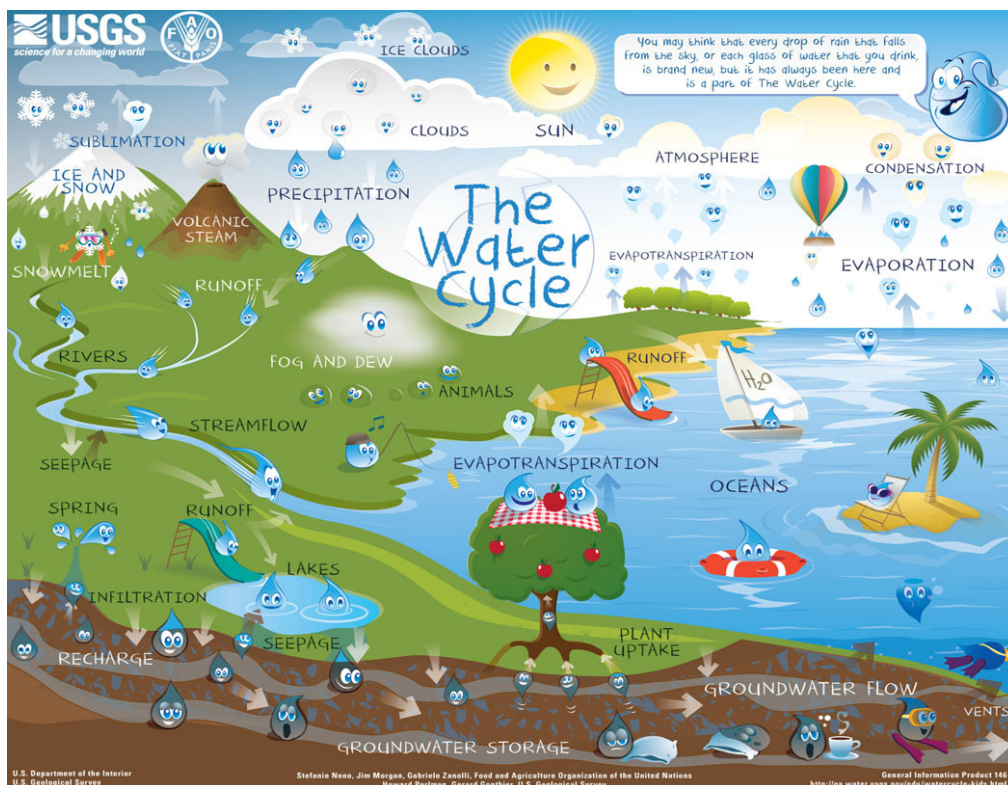
## Introduction

Weather is often about **precipitation** — liquid or solid water particles falling from **clouds**. It can be rain, snow, or hail, for example. It's all part of the **water cycle** — where water falls from clouds to the Earth, flows to rivers, streams, and oceans, and, at some point, **evaporates** and rises back up into the **atmosphere** and **condenses** into clouds.

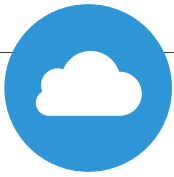
**Explore the water cycle:** <https://youtu.be/z5G4NCwWUxY>

## The water cycle

The water cycle is the continuous, natural circulation of the Earth's water through evaporation, condensation, precipitation, and collection in lakes, streams, rivers, and oceans.



Interactive diagram from the U.S. Geological Survey. Try the interactive game: <https://www.usgs.gov/media/images/usgs-water-science-strategy-water-cycle>



## Activity 1: Cloud in a Jar

All the water available to drink on the Earth — about 121,000 cubic miles of it — circles around and around in the water cycle. And, all the water in the world now was once drunk by dinosaurs. That means that the water we have now is dinosaur pee!

**Explore more about the water cycle:** [https://youtu.be/o\\_bbQ0m3wuM](https://youtu.be/o_bbQ0m3wuM)

The water on the earth evaporates, or turns into gas or vapor, and rises up through the atmosphere. There, it cools and combines with dust to form as clouds. Clouds are a mass of tiny water droplets floating in the atmosphere that we can see from the ground.

**Try this easy condensation activity:** Give each child a metal spoon and have them breathe on it. The warm air from their body has water in it. It will cool quickly as it touches the metal spoon and condenses into fog on the spoon.

Different kinds of clouds exist at different altitudes or heights in the sky. *Cirro/us* means high and *alto* means middle. Stratus clouds are very low, touch the ground, and are gray. Fog is a stratus cloud. Cumulus clouds are also low and puffy, like cotton balls. Cirrus clouds are high and wispy. The clouds can also combine with nimbus clouds to create rain or snow. Depending on how cold it is, the precipitation coming out of the clouds could be snow, hail, sleet, or rain.

**See the cloud chart from Day 2 for examples.**

Review the water cycle and the states of matter of water: liquid, gas or vapor, and solid. See pages 33-37 for resources on water basics.

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### Supplies

- jar or clear plastic cup
- water
- foam shaving cream (not gel)
- food coloring drops
- pencil, paper, or journal for recording observations
- cloud identification sheet



## Activity 1: Cloud in a Jar

### Get kids thinking ...

Start by asking a couple of questions: Do you like it when it rains or snows? What is a cloud? What makes rain fall out of clouds?

Create a model of a cloud to see how rain falls out. Then identify clouds in the sky.

**Explore clouds:** <https://www.pbslearningmedia.org/resource/evscps.sci.life.clouds/clouds-and-weather/>

### Let's get started!

Think and talk about what your the cloud model will look like:

- The water in the jar is the atmosphere
- The shaving cream is a cloud
- The food coloring is water that is collecting in the cloud

### Then build your model:

**Step 1:** Fill the jar or cup almost to the top with water.

**Step 2:** Spray a "cloud" of shaving cream on the top of the water.

**Ask kids** to write a prediction about what will happen when you drip the food coloring into the cloud. Will it stay in the cloud? If it comes out, how long/how many drops will it take?

**Step 3:** Drop food coloring into the cloud until the color starts "raining" into the water below.



Photo: [Raising Veggie Lovers](#)

Explain that rain forms in clouds in the same way. When enough water collects in a cloud it gets heavy and leaks through, forming rain.





# Activity 1: Cloud in a Jar

Explain that depending on the temperature and atmospheric conditions between the cloud and the Earth, the water might freeze and turn into sleet, hail, or snow.

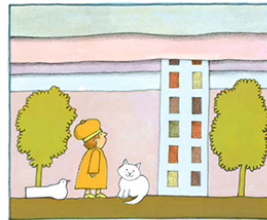
Invite kids to write down what happened and if their predictions were correct in their journals.

Next, head outside to have kids look at the sky and try to identify clouds. If there are no clouds, find pictures of clouds on the internet for kids to identify. This resource can help: [jpl.nasa.gov/edu/learn/project/the-types-of-clouds-and-what-they-mean/](http://jpl.nasa.gov/edu/learn/project/the-types-of-clouds-and-what-they-mean/)



Cumulus clouds are puffy and look like cauliflowers. They also have flat bottoms. They are always changing shape and are low down in the sky.

THIS IS A CLOUD. THIS IS A CAULIFLOWER.

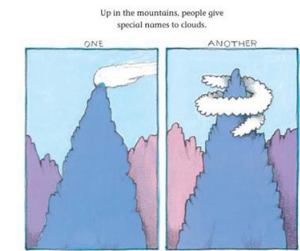


Stratus clouds are low, also. They look like wide blankets of gray and are sometimes called "high fogs." Drizzle or snow flurries may fall from them.

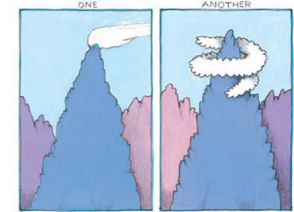
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Fog is a cloud made of water droplets that form at ground level. It can come right into your front yard, especially if you live on a mountain.



Up in the mountains, people give special names to clouds.



One is called the "banner cloud." Another I like to call a "boa cloud."

THIS BOA IS NOT A CLOUD. IT IS A SNAKE!

Page spreads from: *The Cloud Book* by Tomie dePaola

## More precipitation activities

### Water in the atmosphere

<https://gpm.nasa.gov/education/lesson-plans/water-atmosphere>

### Make a mini water cycle

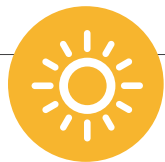
<https://thewaterproject.org/resources/lesson-plans/create-a-mini-water-cycle>

### Play the water cycle dice game

[https://www.arcticclimatemodeling.org/lessons/acmp/acmp\\_k4\\_WaterCycle\\_WaterCycleGame.pdf](https://www.arcticclimatemodeling.org/lessons/acmp/acmp_k4_WaterCycle_WaterCycleGame.pdf)

### Make it rain

<https://thewaterproject.org/resources/lesson-plans/rainmaker-experiment>



## Activity 2: Seasons in the Sun

### Introduction

**Seasons** happen because the earth moves around the Sun and the Earth is tilted on its axis. The Earth spins on an **axis** — like a pole running through the planet from the North Pole to the South Pole. It takes 24 hours for the Earth to spin on its axis — one day. When the Earth is facing the Sun, it's day time. When the Earth is in shadow, it's night.

The Earth also **orbits**, or moves in a circular path, around the Sun. That takes 365 days, or a year. Because the Earth is tilted on its axis, and not oriented vertically, part of the Earth is closer to the Sun for half of the orbit and part is farther away. This results in the Earth getting more or less sunlight throughout the year. That makes seasons.

Places that are neither near the poles nor near the equator are the mid-latitudes. If you live in the mid-latitudes, you have four seasons. If you live closer to the equator, you have two seasons — rainy and dry. That's because these places remain warm with the same amount of light and dark year-round.

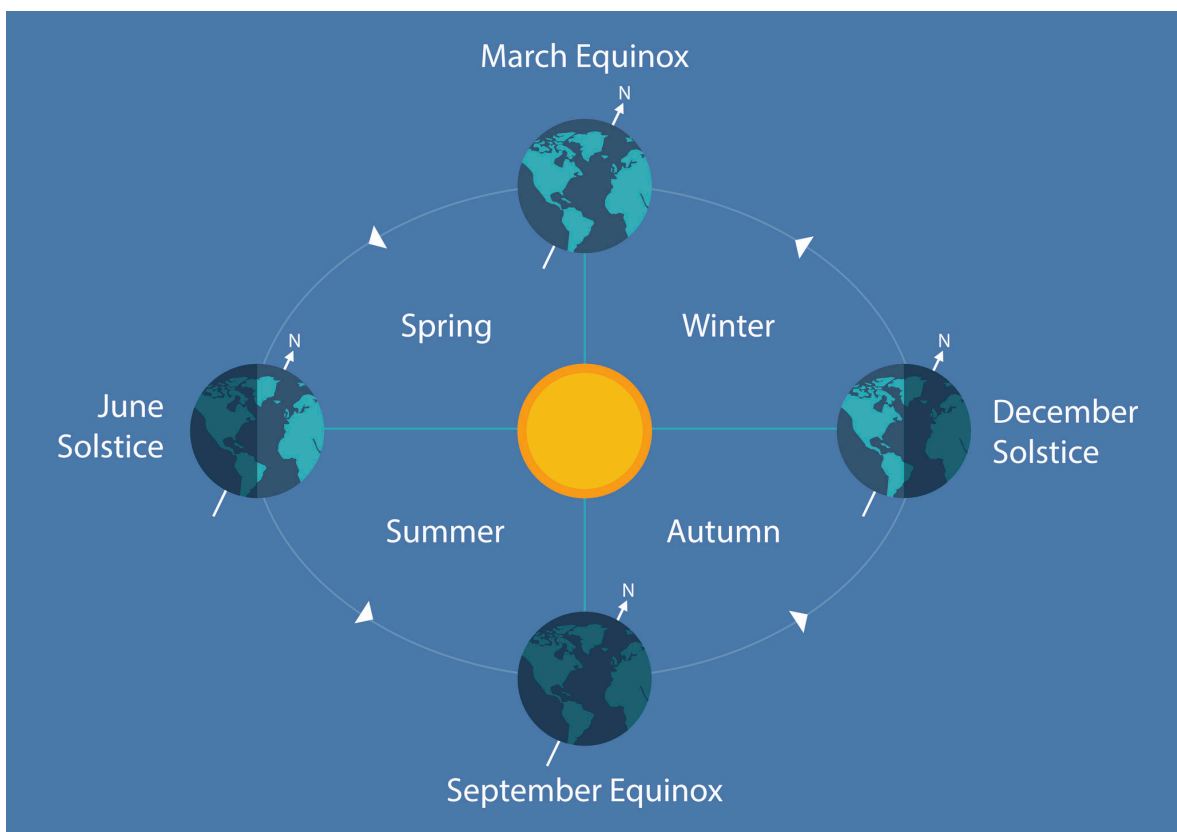
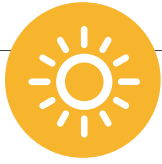


Illustration: iStock



## Activity 2: Seasons in the Sun

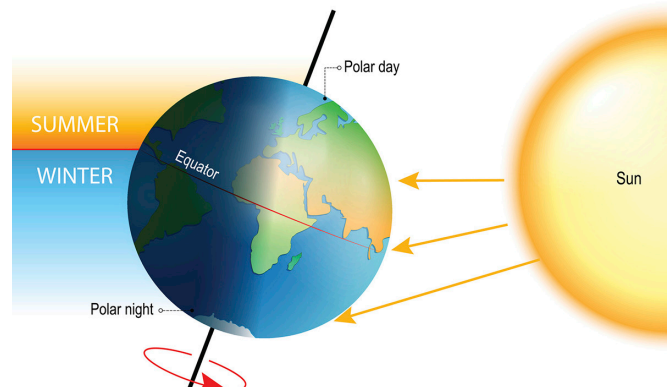
### Supplies

- globe or foam ball and straw or chopstick
- protractor
- push pin
- bright lamp without a shade
- big paper star and some tape
- one sign each for summer solstice, winter solstice, spring equinox, and fall equinox

### Get kids thinking ...

Start by asking some questions:

- What is an orbit?
- What movement of the Earth makes a day?
- What movement of the Earth makes a year?
- What is an axis?
- How far is the Earth tilted on its axis?
- How does the tilt affect how the Sun hits the Earth?
- What season is it here now?

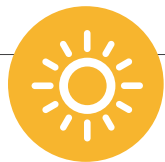


**Explore seasons:** <https://www.calacademy.org/educators/why-do-we-have-different-seasons>

### Let's get started!

**Think and talk about what your season model will look like:**

- The foam ball is the Earth
- The straw or chopstick is Earth's axis
- The push pin is you
- The lamp is the Sun



## Activity 2: Seasons in the Sun

### Get oriented:

- Have kids make a circle
- Place your lamp without shade in the center of the circle and turn it on

**Ask kids** to imagine they are the Earth and the light is the Sun. Then have them spin once in place and ask, “If you are the Earth, how much time does it take for you to turn around once?” Answer: a day.

Next, have them walk around the whole circle, returning to the spot where they started and ask, “You are still the Earth. How much time does it take for the Earth to orbit, or go all the way around the Sun?” Answer: a year.

Next, ask them to try to do both at once, slowly. Spin on their own axis while orbiting the Sun. Have them go about 1/4 of the way around the Sun.

Explain that’s what the Earth does: it rotates on its axis resulting in day and night, and at the same time, it circles the Sun. Because the Earth tilts, we get seasons.

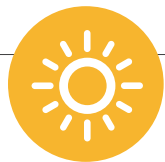
- Tape the star on a wall someplace where all the kids can see it. Explain that this represents Polaris, or the **North Star**. The Earth’s northern hemisphere tilts 23.5 degrees toward it.
- Show kids 23 degrees on the protractor (or about 1/8th of a circle)
- Still standing in their circle around the lamp, have the kids tilt their bodies about 23 degrees toward the star.



### Explore solstices and equinoxes

Ask them to notice which way their bodies are tilting in relation to the Sun.

- If they are leaning directly away or towards the Sun, their place on the circle is a solstice. Mark the spots on the circle with the winter and summer solstice signs.



## Activity 2: Seasons in the Sun

- If they are not leaning either toward or away from the Sun, their place on the circle is an equinox. Mark the spots on the circle with the fall and spring equinox signs.

Explain that a **solstice** is the point in the year when the Earth is tilted the most towards the Sun or away from it. The winter solstice is the shortest day of the year. The summer solstice is the day with the longest amount of sunlight in the year.



An **equinox** is the time of year when the Sun passes right over the equator. Day and night are the same length. Equinoxes happen in the spring and fall.

### Then build and use your season model:

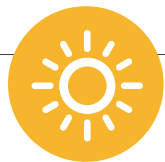
**Step 1:** If not using a globe, put the straw or chopstick through the center of the ball.

**Step 2:** Point out the axis of the globe or your model (the straw/chopstick).

**Step 3:** Show kids 23 degrees on the protractor again (or about 1/8th of a circle) and tip your model or point out how the axis on the globe is tipped, not vertical.

**Step 4:** Place a push pin on the ball or globe to represent a person on the Earth.

Walk around the circle with the model and ask the kids to observe how the light hits it. When



## Activity 2: Seasons in the Sun

you get to a solstice or equinox spot, spin your model or globe so the kids can see how long day or night is.

Invite them to imagine they are the push pin and ask them how much Sun, and which season it is as you make your way around the circle.

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### More activities about seasons

#### **Make a four season tree**

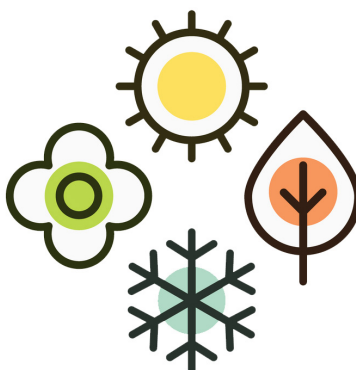
<https://www.generationgenius.com/activities/four-seasons-activity-for-kids/>

#### **Outdoor activities by season**

<https://runwildmychild.com/outdoor-activities-for-kids-by-season/>

#### **Kinesthetic Astronomy: Longer Days, Shorter Nights**

<https://www.calacademy.org/educators/lesson-plans/kinesthetic-astronomy-longer-days-shorter-nights>







# Activity 3: Climate Check! Climate vs. Weather

## Introduction

Weather in any one place can change from day to day. Climate is the average weather in a place over a long time, like 30 years. Climates can change, too, but they change very slowly. Understanding the difference between weather and climate is the first step in understanding how climates change, too. Explore climate vs. weather in these videos below:

**Weather vs. Climate (Crash Course):** <https://youtu.be/YbAWny7FV3w>

**Climate and Weather (NOAA):** <https://youtu.be/ID6KsSjoNOY>

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## Supplies for each group

- cup filled with at least 30 colored beads of different colors
- blank calendar page with all the days of the month
- pencil

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## Get kids thinking ...

Start by asking:

- What is climate? How is it different from weather?
- What climate do you live in?
- Is there a different climate where you'd like to live?



# Activity 3: Climate Check! Climate vs. Weather

## Let's get started!

Start reading a book about weather, like *The Snowy Day*, *The Wind Blew*, or *Rain* and ask kids if they remember a time when it was snowy, windy, or rainy. Then discuss the difference between weather, which changes a lot, and climate, which is the average weather in a place over time. For example, sometimes it rains in the desert, but that is rare. The climate in the desert is arid or dry.

**Ask kids:** Can you imagine a way to show how weather and climate are different but related? Here's an activity that lets kids see this idea.

Divide kids into at least four groups. Explain that the beads represent different kinds of weather. Show them the colors of the beads and ask them to assign a kind of weather to each color. For example, yellow could be sunny and dry, purple could be snow, green could be cool and windy, blue could be hot and humid, etc.

Then have each group take a bead out of the cup and write that kind of weather in the square for the first day of the month. Ask them to share the weather they drew for that day. Have them repeat the process until they have filled their calendar.



Ask each group to count up how many days each kind of weather occurred in their month and share their summary. Was there any pattern to the weather?

Then put the four calendars and summaries together. Explain that weather is what happens from day to day, but climate is the average weather conditions in a place over a long period of time. Invite kids to look at the four (or more) calendars together to see what the weather pattern was over the whole time.



# Activity 3: Climate Check! Climate vs. Weather

## Community connection

Now connect what kids have learned about weather, seasons, and climate to your own community. Have a weather and climate scavenger hunt. Look for different examples of how weather and climate affect your community. Invite kids to fill out the chart and decide whether what they see is evidence of recent weather or of long-term climate. Add more examples when you find them.

Example	Where did you find it?	Effect: what do you see here?	Why?	Is this weather or climate?
A sunny place				
A shady place				
A place with trees				
<i>Example: a windy place</i>	<i>The top of a hill</i>	<i>Trees bent away from wind, no leaves on the ground</i>	<i>The wind pushed them for a long time</i>	<i>Climate — it must be windy here a lot and for a long time</i>
A place with erosion (water or wind)				
A place with water like a pond, lake, creek, or river				
A dry place				



# WEATHER WALK

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Take kids outside with their **Weather Journals** to observe the weather. After the **Daily Data Collection** and **Sky Sketch**, ask kids if they see clues or evidence of any precipitation or the water cycle.

Do they see any clues about the season? Invite them to share their observations, why they think what they see is an indication of precipitation or the season, and write their observations in their journals.

Follow up on your **World Weather Wise** activity and talk more about the weather and climate of this location. Discuss what season this location is experiencing and ask kids how they can tell, and what kind of climate it has.

If you have the opportunity, take the kids outside more than once during the day to observe how the weather changes.

**Repeat the Daily Weather Walk every day.**



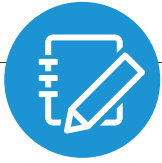
# Weather Movement

## Make a human thunderstorm

**Say:** “As a group, right in this room, we are going to create a rainstorm. We will make the rainstorm using our hands and feet. Watch my hands, then follow and do the same thing.”

- Rub hands together (wind)
- Snap fingers (sprinkling rain)
- Clap hands (heavier rain)
- Slap thighs (pouring rain)
- Stomp feet and continue slapping thighs (thunder and heavy rain)
- Slap thighs (thunder stopped)
- Clap hands (rain is slowing)
- Snap fingers (rain is down to a sprinkle)
- Rub hands (Sun is coming out and a fresh breeze is blowing)
- Hands on lap (silence after a storm)





# Writing About Weather

## Weather word cloud

Do a word association exercise with kids: have them draw the shape of a large cloud and then fill it in with all the words that pop into their heads when you say “weather.” You can also have them try associating with different words, such as rain, storm, or sunshine. Kids could also use an online word cloud generator to make their weather word cloud, or you could combine all words generated by kids into an online word cloud generator to make one big word cloud.

## Haiku

Haiku is a Japanese form of poetry, usually about nature or the seasons. It is made up of three unrhyming lines. The first and last line have five syllables. The middle line has seven syllables. The last line usually makes some kind of observation about the subject. Invite the kids to write a poem about the weather or the seasons.

## Sensing the season

Invite kids to choose a season and imagine what they’d see, hear, touch, smell, and taste. Fall might include leaves of many colors, falling leaves, cold winds blowing, sunlight changing, leaves crunching underfoot, campfire smoke, pumpkin pie, apples, etc. They can organize these observations into a poem, inviting the reader to guess what the subject is at the end.

## Seasonal music

Play Vivaldi's masterpiece, *The Four Seasons*, and get kids to reflect and write about the qualities of the weather from season to season as they listen. The idea behind this writing exercise is for students to generate their impressions or ideas — or characters, themes, or rhythms — that can be further developed later into a poem, paragraph, or story.

[https://freemusicarchive.org/music/John\\_Harrison\\_with\\_the\\_Wichita\\_State\\_University\\_Chamber\\_Players/The\\_Four\\_Seasons\\_Vivaldi](https://freemusicarchive.org/music/John_Harrison_with_the_Wichita_State_University_Chamber_Players/The_Four_Seasons_Vivaldi)





# Kid-Friendly Digital Media

## Apps

Kid Weather App \$

<https://www.kidweatherapp.com/>

NASA Citizen Science App

<https://observer.globe.gov/about/get-the-app>

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## Online games

Cloud Matching Game

<https://scied.ucar.edu/interactive/cloud-matching-game>

Clouds Memory Game

<https://scied.ucar.edu/interactive/clouds-memory-game>

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## Websites

National Geographic Seasons

<https://education.nationalgeographic.org/resource/season/>

Old Farmer's Almanac for Kids

<https://www.almanac.com/kids#weather>

SciJinks NOAA website for kids

<https://scijinks.gov/>

Brain Pop: Weather

<https://www.brainpop.com/science/weather/>



# Kid-Friendly Digital Media

## Climate Kids (NASA)

<https://climatekids.nasa.gov/>

## Gizmos: Weather, Climate and Seasons

<https://gz.explorelearning.com/index.cfm?method=cResource.dspResourceExplorer&browse=-Science/Grade%203-5/Earth%20and%20Space%20Science/Weather%2C%20Climate%2C%20and%20Seasons>

## National Oceanic and Atmospheric Administration — Education

<https://www.noaa.gov/education>

## NOAA: Discover Your World with NOAA

<https://oceanservice.noaa.gov/education/discoverclimate/>  
<https://oceanservice.noaa.gov/education/discoveryourworld.html>

## American Meteorological Society

<https://www.ametsoc.org/index.cfm/ams/education-careers/>

## Weather Channel

<https://weather.com/>

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## Video

### What Causes the Seasons?

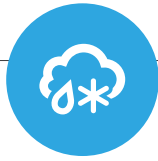
<https://youtu.be/u41ozQchuXk>

### How Clouds Form

<https://youtu.be/-YySltYzvtU>

### Size Matters: Measuring Raindrop Sizes from Space

<https://gpm.nasa.gov/education/videos/size-matters-measuring-raindrop-sizes-space>



# Water Basics

## Basic facts about water

- There is a finite amount of water on the Earth and it moves around through the water cycle.
- Water exists on Earth in three states: solid as ice; gas as vapor, fog, or mist; and liquid as water.
- The way water behaves changes with the seasons (rain, snow, hail, flooding, drought).
- People, plants, and animals need water to live.

## Water words

### Absorption

The process of being soaked up.

### Clouds

A mass of water vapor that floats in the sky. Different cloud types form at different altitudes and temperatures. 3 common cloud types: **Cirrus**: thin, wispy and feathery cloud. **Cumulus**: fluffy white cloud with a flat bottom. **Stratus**: wide, thick low-lying gray cloud.

### Condensation

When gas cools and changes to a liquid, for example, when warm steam touches a cold window.

### Drought

A long period with little or no rain.

### Evaporation

When a liquid heats up and changes to gas.

### Flood

An overflow of water onto land that is normally dry.

### Fog

A thick mass, like a cloud, made up of tiny water drops floating in the air and touching the ground.

### Hail

Frozen rain, or small balls of ice that fall from the sky.

### Ice

Water in a frozen, solid state.

### Precipitation

Water falling in the form of rain, snow, or hail.

### Rain

Drops of water that form in the clouds and fall from the sky.

### Snow

Soft, white flakes of ice that fall from the sky. Snow is formed when water in the upper air freezes into crystals.

### Sublimation

When ice changes to gas, skipping the liquid state.

### Surface tension

The "sticking together" of water molecules on the top surface. It explains why insects can walk on water!

### Transpiration

When plants give off moisture into the air.

### Vapor

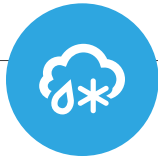
Tiny drops of water in the air; the gas form of water. Clouds are made of water vapor.

### Water

A clear thin liquid that has no color or taste when it is pure. It falls from clouds as rain or snow and enters rivers, lakes, and oceans. All animals and people need water in order to live.

### Water cycle

The continuous, natural circulation of the earth's water through evaporation, condensation, precipitation, and collection in lakes, streams, rivers, and oceans.



# The water cycle

The water cycle is the continuous, natural circulation of the Earth's water through **evaporation**, **condensation**, **precipitation**, and collection in lakes, streams, rivers, and oceans.



Interactive diagram from the U.S. Geological Survey. Try the interactive game:  
<https://www.usgs.gov/media/images/usgs-water-science-strategy-water-cycle>



# Children's Books about Water

## Fiction

- *Bringing the Rain to Kapiti Plain* by Verna Aardema (Gr 2-3)
- *Come on Rain!* by Karen Hesse (Gr K-2)
- *Hurricane* by David Wiesner (Gr 1-3)
- *Hurricane!* by Jonathan London (Gr 1-3)
- *It Looked Like Spilt Milk* by Charles G. Shaw (Gr 1-5)
- *Rain* by Manya Stojic (Gr 1-2)
- *Rain Rain Rivers* by Uri Shulevitz (Gr K-2)
- *The Snowy Day* by Ezra Jack Keats (Gr 1-2)
- *Waiting Out the Storm* by Joann Early Macken (Gr 1-2)
- *Walter Was Worried* by Laura Vaccaro Seeger (Gr 1-5)
- *Water Boy* by David McPhail (Gr 1-3)

## Poetry

- *All the Water in the World* by George Ella Lyon and Katherine Tillotson (Gr K-3)
- *I Know the River Loves Me / Yo se que el rio me ama* by Maya Christina Gonzalez (Gr 1-3)
- *Water Dance* by Thomas Locker (Gr K-2)
- *Watersong* by Tim McCanna (Gr K-1)
- *Weather Poems for All Seasons* by Lee Bennet Hopkins (Gr K-2)

## Nonfiction

- *Clouds* by Anne Rockwell (Gr K-3)
- *DK Eyewitness: Water* by John Woodward (Gr 3-5)
- *A Drop of Water* by Walter Wick (Gr 3-5)
- *Hurricanes* by Gail Gibbons (Gr 1-3)
- *I Get Wet* by Vicki Cobb (Gr K-2)
- *The Magic School Bus Inside A Hurricane* by Joanna Cole (Gr 1-3)
- *National Geographic Kids: Water* by Melissa Stewart (Gr 1-5)
- *One Well: The Story of Water on Earth* by Rochelle Strauss (Gr 3-5)
- *Rivers of Sunlight* by Molly Bang and Penny Chisholm (Gr 2-5)
- *Water Is Water: A Book About the Water Cycle* by Miranda Paul (Gr 1-5)



# Activity: Water, Ice, and Steam

## Introduction

Introduce kids to the three states that water can be in: liquid, solid (ice), and gas (steam or vapor).

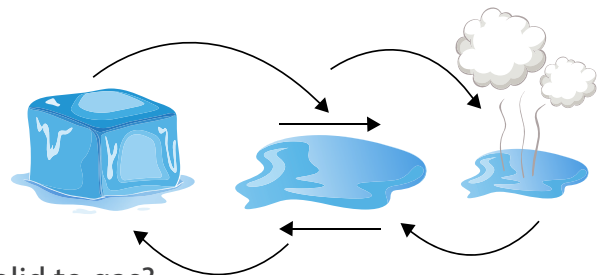
## Supplies

- Electric skillet with lid
- Ice cubes
- Water

## Get kids thinking ...

### Start by asking a couple of questions:

- What does ice or snow feel like?
- What does water feel like?
- What does steam or vapor feel like?
- What makes water change its state, from liquid to solid to gas?
- What happens to ice when you take it out of the freezer?



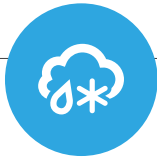
## Let's get started!

Show the kids the ice cubes. Let them touch the ice. Ask them to describe how the ice feels and what it looks like. Put the ice in electric skillet. If you have time, let the ice melt on its own. If not, turn on the skillet to low and let the ice melt.

Once the ice has melted, ask the kids what they have observed. How has the ice changed? What state is the ice in now? (liquid) What shape is it? Ask the kids to predict what would happen if you put the water in the freezer. What would happen if you turned up the heat?

Turn up the heat on the skillet and bring the water to a simmer, so that the kids can see the water turning into steam. Be careful to kids away from the hot skillet and steam.





## Activity: Water, Ice, and Steam

Ask the kids what they have observed about the water. How has it changed? What state is it in now? What shape is it?

Ask the kids to predict what would happen if you turned off the heat. Ask the kids to predict what would happen if the steam met with very cold air.

If you have a lid, put it on the skillet and let the steam collect and condense on the inside. After a few minutes, lift up the lid and show the kids what the steam is doing.

Ask them what they think is happening. What do they observe? How has the steam changed? What state is the steam in now? (liquid) What shape is it? What are the drops of water doing?

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### Introduce water words

Talk about these words and what they mean: evaporation, condensation, precipitation, and for extra fun: sublimation (ice to gas state, skipping the water stage) and transpiration (water vapor produced by plants through photosynthesis).