READ ALL ABOUT IT!

Research Exploration Activities Discovery

READ the Clouds
Adventures with Weather

June 8 – June 13

Clouds come in all sorts of shapes and sizes, from wispy streaks to cotton-candy poofs to rolling, dark thunderheads. We know what clouds look like on the outside. This week, let's see what's on the inside of these ever-changing sky riders and what happens when what's inside falls out.

Research - Read a few books. Ask a few questions. What have you wondered about?

Explore - Can you predict the weather?

Activities - Make some great art. Give a weather report. Watch amazing lightning storms.

Discovery - What did you learn?

Clouds

Clouds form when water evaporates and rises into the atmosphere. The water vapor cools and collects together. The atmosphere is the air space that surrounds Earth. It goes up 600 miles from the Earth's surface. The closest layer of the atmosphere, the troposphere, which rises 4 to 12 miles from Earth, is where clouds form and our weather starts. Inside a cloud we find water in different forms: water vapor, water droplets, and ice crystals. (Vapor, droplets, and ice crystals reflect and scatter the sunlight so we can see clouds.) Clouds can have tiny dust, pollen, salt, and volcanic ash particles. It's also very windy in there. The wind currents smash the water droplets into each other, making them stick together, until they get big and heavy. Once they get heavy enough, they fall to Earth as rain.

Most of us draw rain as a teardrop shape, which is funny because rain comes in a bunch of shapes none of which are teardrops. The tiniest mist droplets are so small that they float in the air. Drizzle drops are round. As the drops get bigger they start to look like hamburger patties. The biggest drops are shaped like tubes and are made from 2 million droplets.

Sometimes other things get caught up with the wind and rain. No one has reported cats and dogs yet, but people have seen spiders, fish, rats, crabs, worms, baby alligators, a frozen squid, small lizards, frogs and periwinkles.

Make a cloud experiment

Tools: jar, funnel, hot water, ice cubes.

Fill the jar with hot water. Set the funnel in the mouth of the jar. Put the ice cubes in the funnel. The difference in air temperature between the ice and the water will cause a cloud. If the cloud is hard to see, try putting the experiment in front of something dark.

Cloud Soap

Unwrap a bar of Ivory soap (it has to be Ivory) and place on a microwave-safe plate. Microwave for 1-2 minutes. Watch the soap grow and turn into a cloud. Use in the tub after playing all day long!

Lightning

Lightning also comes from clouds. It is a tube of plasma burning hotter than the sun, crackling its way to other clouds or to Earth. It can do some amazing things. When lightning hits sandy soil it can melt the sand together in the shape of the electricity's path. The form it makes is called fulgurite. Scientists are able to capture odd and mysterious things with cameras. Red sprites and ball lightning have them baffled--for now.

Watch Pecos Hank and How Lightning Works and Pecos Hank's Top 10 Lightning Strikes on YouTube.

Thunder

What makes that noise we call thunder? It's not clouds bumping into each other or angels bowling. It is all about waves--light waves and sound waves--and instant heat.

Thunder is the shock wave caused by lightning heating and expanding the surrounding air. It works like this: When lightning sparks, it sends a **HUGE** amount of energy into the air all around it. All that energy, in that split second that the lightning blasts, heats the air super fast. The thunder comes from the movement of the super-heated air, expanding and crashing into the space around it. BOOM. The reason we don't see the lightning and hear the air movement (thunder) at the same time is because the light waves from the lightning race towards us at 186,000 miles per second. The sound waves from the heating and expanding of the air travel towards us at 1,070 feet per second. That's pretty fast, but not nearly fast enough to keep up with the light waves from the lightning we see. If you can count to 5 between the lightning flash and the thunder, then you know that the storm is 1 mile away.

Thunder and lightning picture

Use heavy paper to support all the art that will be happening in this project. Watercolor paper works best. With a white crayon draw on the lightning. Press pretty hard so you cover all the paper where you want the lightning to be bright white. The crayon will keep the paint from coloring that part.
Tape your paper to a board, if you can. This will keep the paper from curling up too much.
Lightly brush the paper with water. This will help the watercolors run together and make a stormy sky. Use blue, green and purple water colors to paint in the sky. Let the watercolors dry. If you are a little impatient you can use a hair dryer set on low to help speed up the drying part.
With a sponge or cotton ball and a little black watercolor, paint on the cloud. "Bouncy" is what it should look like when you put the paint on. You don't want to rub the paint in (it breaks the paper) because it helps the sky and the cloud look different. Let the cloud dry.
While the cloud is drying, cut out a skyline on dark paper. It can be a city, a farm, your house, mountains, or wherever you want your storm to happen. Glue skyline to the bottom of your picture.
This technique can be used to make all sorts of pictures. Use different colored crayons and watercolor washes to make something new.

Rainbows

Sir Isaac Newton is famous for pondering a fallen apple and gravity. He also discovered what was hiding inside white light. In a darkened room, Newton shone a small beam of sunlight into a triangle-shaped glass prism. The prism shape made the sunlight bend and split into 7 colors. Newton worked out that light is made of color and that those colors all bend differently, fanning the colors out for us to see. After a storm, water drops still hang in the air. Sunlight hits the drops and bends into a rainbow. The same bending gives us red sunsets, blue skies, halos, moonbows, fogbows, and icebows.

Sparkle Rainbow Paint

Mix together: ½ cup **salt**
½ cup **all-purpose flour**
½ cup **water**
Mixture should be the consistency of pudding.
Add: **food coloring,** enough to make the desired shade
Use a funnel to pour into a squeeze bottle or a zip-lock bag with a tiny snip cut from one corner. Use on heavy paper. Air-dry overnight. Store, air-tight, in the refrigerator up to 3 days. Shake before using. The salt in the paint makes it sparkle in the sunlight.

Weather Reports

Knowing what weather is coming is important. Early reporters relied on plants, clouds, and animals for clues. Bees staying in their hive and sulky cows lying in a field meant rain was coming. Birds flying high and dew on the grass meant no rain any time soon. Red skies in the morning, storm's a comin'. Red skies at night, calm and dry. Official forecasts started with a guy standing on top of the printing house with a wet finger, trying to feel which way the wind was blowing. Now we have all sorts of tools, computers, and satellites to help predict what weather is on its way.
Watch a weather report on TV. Notice the map they use to show the weather. You can see the map but the forecaster can't. It is a special effect, a green screen trick.

The Weatherman Game

This game takes two people, one big button-up shirt, and someone to laugh. The two people stand, one in front of the other, facing the same way. The person in back puts the shirt on backwards with the front person between their arms. It can be a little squishy. The person in front is the head and gets to do all the talking. The person in back moves their arms and hands to add all the gestures to the weather report. Imagine a report with thunder and lightning! Tornados! Heat from too much sun!

Especially for Preschoolers

- Go around the house and yard and see what noise things make. Try out a light switch, two spoons banging together, the doorbell, different toys, the dryer, or a creaky floor. Walk around the neighborhood and listen for cars, barking dogs, water, kids, bees, noisy feet. Make your feet noisy.
- Play hot and cold. Pick an object in the room or hide one. When the child gets closer, they get warmer. As they get farther from the object, they get colder.
- 'Paint' the sidewalk, driveway, fence, or porch with a bucket of water and a foam brush or a sponge.
- Talk about the weather. Show pictures and ask questions. "What do we wear when it looks like this outside?" "What do we do when the weather is like this?" "What is today's weather like?"
- Have them make shapes with a piece of yarn. It's great practice for cloud watching.

At the end of the week, send us a picture or a message highlighting your favorite activity. One submission per family, per week. Submissions are due by 5:00 pm Saturday, June 13. With your submission, we will enter your name in a drawing for a gift card to a local business. One prize will be awarded each week. Winners will be notified on Mondays.

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#PGREADallaboutit
#READtheclouds
PGlibkids@gmail.com

READ the Clouds
Adventures with Weather Book and Movie List

Board Books

A Windy Day in Spring by Charles Ghigna BOA GHI

Raindrops Fall All Around by Charles Ghigna BOA GHI

Sunshine Brightens Springtime by Charles Ghigna BOA GHI

Picture Non-Fiction

The Cloud Book by Tomie DePaola PIC Science Earth

Clouds by Erin Edison PIC Science Earth

The Magic School Bus Kicks Up a Storm: A Book About the Weather by Joanna Cole PIC Magic School Bus

I Can Read About Weather by Robyn Supraner PIC Science Earth

The Magic School Bus Presents Wild Weather by Sean Callery PIC Magic School Bus

The Magic School Bus Inside a Hurricane by Joanna Cole PIC Magic School Bus

Curious George Discovers the Rainbow by Amy E. Cherrix PIC Science Physics

Once There Was a Raindrop by Judith Anderson PIC Science Earth

A Cool Drink of Water by Barbara Kerley PIC Science Earth

Did a Dinosaur Drink This Water? by Robert E. Wells PIC Science Earth

I Get Wet by Vicki Cobb PIC Science

What *Is the Water Cycle* by Ellen Lawrence PIC Science Earth

<u>Picture Fiction</u>

Boom Boom by Savinder Naberhaus PIC NAB

Bruce's Big Storm by Ryan T. Higgins PIC HIG

Chilly Milly Moo by Fiona Ross PIC ROS

Cloud Dance by Thomas Locker PIC LOC

The Cloud Spinner by Michael Catchpool PIC CAT

Cloudette by Tom Lichtenheld PIC LIC

Cloudy with a Chance of Meatballs by Judi Barrett PIC BAR

Freddy the Frogcaster by Janice Dean PIC DEA

Froggy Day by Heather Pinder PIC PIN

Hey, Water by Antoinette Portis PIC POR

It Looked Like Spilt Milk by Charles Shaw PIC SHA

Little Cloud by Eric Carle PIC CAR

Puddle Jumpers by Anne Margaret Lewis PIC LEW

Sector 7 by David Wiesner PIC Caldecott Wiesner

This Beautiful Day by Richard Jackson PIC JAC

Un-brella by Scott E. Franson PIC FRA

<u>Early Reader Non-Fiction</u>

Clouds by Marion Dane Bauer E Science Earth

Fly Guy Presents: Weather by Tedd Arnold E Science Weather

It's Rainy by Alex Appleby E Science Weather

Oh Say Can You Say What's the Weather Today? by Tish Rabe E Science Earth

Seasons by Linda Aspen-Baxter E Science Weather

Water by Melissa Stewart E Science Earth

Water Everywhere by Jill Atkins E Science Earth

Weather by Kristin Baird Rattini E Science Weather

Whatever the Weather by Karen Wallace E Science Weather

Early Reader Fiction

Amanda Pig and the Really Hot Day by Jean Van Leeuwan E VAN

Junior Non-Fiction

DK Guide to Weather by Michael Allaby J Science Earth

Experiment with Water by Bryan Murphy J Science Experiments

Experiment with Weather by Miranda Bower J Science Experiments

Forces of Nature by Jenny Vaughan J Science Disasters

Saving Water by Jen Green J Science Environmental

Scholastic Atlas of Weather J Science Earth

Totally Amazing Facts About Weather by Jaclyn Jaycox J Science Earth

Wacky Weather and Silly Season Jokes by Melissa Stewart J Science Earth

Weather by Mark Pettigrew J Science Earth

Weather by Madeline Tyler J Science Earth

Weather and Climate J Science Earth

Weather in 30 Seconds by Jen Green J Science Earth

Weather Watcher by John Woodward J Science Experiments

Junior Fiction

The Cloud Castle by Thea Stilton J FIC STI

The Maloneys' Magic Weatherbox by Nigel Quinlan J FIC QUI

Shouting at the Rain by Lynda Mullaly Hunt J FIC HUN

Teen Non-Fiction

It's Getting Hot in Here: The Past, the Present, and the Future of Global Warming by Bridget Heos Teen Science Environmental

Adult Non-Fiction

The AMS Weather Book: The Ultimate Guide to America's Weather by Jack Williams Science Earth

National Geographic Pocket Guide to the Weather of North America by jack Williams Science Earth

Restless Skies: The Ultimate Weather Book by Douglas Paul Science Earth

Thunder & Lightning: Weather Past, Present, Future by Lauren Redniss Science Earth

Websites to explore-

What Is Weather? For Kids - Weather Explained - Science For Kids
https://www.youtube.com/watch?v=1ZyT_Aiey1U

How's The Weather? | Super Simple Songs
https://www.youtube.com/watch?v=rD6FRDd9Hew

I Want To Be a Meteorologist - Kids Dream Jobs - Can You Imagine That?
https://www.youtube.com/watch?v=5-yYOpgmmp8

DIY Science for Kids Rainstorm
https://www.youtube.com/watch?v=O2_1mwGjTRY

Cloud Dough
https://www.thebestideasforkids.com/cloud-dough/