The Basics of Weather

- Map: The Caribbean Islands
- KidsPost Reprint: “The sweet science behind fall leaves”
- KidsPost Reprint: “Bring fall color inside with leaf crafts”
- Student Activity: Weather Views and Icons
- Meet the Capital Weather Gang
- Student Resource: The Capital Weather Gang Reports the Weather
- Student Activity: What’s THE WEATHER?
- Student Activity: Severe Weather Events
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Children experience each day’s weather. Raindrops and sleet touch their skin. They taste snow gathered in balls or cones. They feel the wind rustle their hair and blow against their jackets. They hear the thunder. And if weather conditions are harsh, they see the results scattered about.

Teach children the words and signs to distinguish the varied weather conditions. Also introduce students to the KidsPost page and the illustrations for the forecasted weather. Talk about the weather and climate of the D.C. area. Draw a scene to reflect a weather condition. These may be submitted to KidsPost for publication.

Ever wonder who writes about weather for The Washington Post? Meet the Capital Weather Gang. Editors Jason Samenow and Angela Fritz answer our questions about their work. Reading about all 21 members of the Capital Weather Gang provides an impressive introduction to careers and expertise in meteorology.
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The Caribbean Islands

[Map of the Caribbean Islands]
The sweet science behind fall leaves

*Reds, oranges and yellows emerge in the fall when trees stop making sugar.*

BY RACHEL FELTMAN

*Originally Published September 25, 2017*

It wouldn't feel like fall without the sight, smell and oh-so-familiar crunch of fallen leaves. But why do some trees change their colors — and then give up their leaves — as autumn sets in?

First, a bit about why leaves are usually green. Humans have to eat food to get the nutrients that keep us alive, but plants use the sun to power photosynthesis (pronounced fo-toe-SYN-thuh-sis), which turns air and water into delicious, nutritious sugar. The secret to this sweet process is chlorophyll (CLORE-o-fill), which absorbs sunlight and happens to be green.

As winter approaches, the sun stays up for less time every day. That makes it hard for chlorophyll to keep trees sugared up, leaving them dependent on extra food from the summer. Trees stop producing new chlorophyll, because doing so would be a waste of energy, and soon there’s none left.

That explains where the green goes. But where do all those oranges and reds and yellows come in?

Chlorophyll usually steals the spotlight, but leaves also contain other pigments (that’s a substance that provides color), including the ones that make carrots orange and turn egg yolks yellow. Without chlorophyll's green, these pigments finally make themselves known.

Sometimes, trees also produce the same red pigments that give raspberries their color. Leaves make those red pigments only in the fall, and scientists aren’t sure why it happens. But it must be for a good reason, because it takes a lot of sugar — which the tree needs to save up as much as possible. One guess is that these deep reds help protect dying leaves from sun damage, allowing them to collect energy just a little longer. They may also serve as a warning to animals that might otherwise eat or lay eggs on the leaves.

The exact coloring of fall foliage is the result of a mix of these red, orange and yellow pigments. So environmental conditions that change how much there is of each — such as sun exposure, soil moisture and temperature — can make a big difference. Colors vary by species, too.

Eventually, sunlight and frost kill off all pigments but tannin, which is brown. The very cells of the leaf will break down as well, making them fragile and dry. Meanwhile, the tree creates corklike cells to seal itself off from its leaves, even creating a sort of scab where each one connects to the branches. Eventually wind or some other disturbance will break the dying leaf away, leaving the tree with a tiny scar.

That’s how we get those brilliant bursts of color — and wonderful leaf piles to hop around in. In the spring, trees get to make new leaves and start the whole process again.

Feltman is the science editor for Popular Science Magazine.
Bring fall color inside with leaf crafts

Kids can preserve leaves and even turn them into birds and other animals.

Bring some autumn color into your home with these easy leaf crafts.

Leaf animals
What you will need:
■ Leaves (preserved work best; see below) of different colors and shapes, small sticks, construction paper, glue, paper towels, a heavy book and your imagination.

What to do:
1. Your imagination is the key tool. On a sheet of construction paper, arrange leaves to resemble a bird or other animals. Use sticks for legs or draw them on the sheet.
2. Lightly glue your leaves down. Cover with paper towels, and place a heavy book on top of the towels for several hours.

Preserving fall leaves
There are several ways to keep the color of your leaves pretty for a long time. With a grown-up’s permission, check out this website: www.hometrainingtools.com/preserving-autumn-leaves/a/1366.

Fall foliage can become works of art, such as this leafy fox.

Make your own colorful fall leaves
What you will need:
■ Newspaper, coffee filters, markers, spray bottle of water, scissors and paper towels.

What to do:
1. Cover your work surface with newspaper, because this can get messy.
2. Use markers to color a coffee filter. Scribbling is fine, because you don’t have to cover the whole surface.
3. Spray your colored filter lightly with water, then tilt the filter so the water helps the colors run together.
4. Place the filter on a paper towel to dry. (It takes only a few minutes.)
5. Trace a leaf shape on the dry colored filter, and cut it out. Hang your leaf in a window so it catches the sun. You may want to make a whole batch!

— September 21, 2017
This activity was originally published in 2013.
Weather Views and Icons

KidsPost

What does fall look like? Send us your vision.

KidsPost needs artwork for our print forecast and online art gallery.

Fall is on the way. At KidsPost, that means we need artwork to reflect the change of season. So we’re hoping you will help us out.

Whatever you think fall looks like, put that image down on paper. If your art fits with the daily weather forecast, we’ll consider publishing it in KidsPost. Remember, we need art for days that are sunny, cloudy, rainy and windy. We know you love Halloween scenes, but it’s not quite time to put out the jack-o’-lanterns.

Bright colors work best. You can use paints, markers or whatever art supplies you have, but try to avoid leaving a lot of white space on the page. Be sure to include your full name, age (5 to 13) and home town on the back of your artwork. We also need a note from a parent, guardian or teacher giving permission for your drawing to be used.

Pictures should be sent to KidsPost, The Washington Post, 1301 K Street NW, Washington, D.C. 20071. Or have an adult fill out the online KidsPost form.

— Christina Barron

Illustration by Amarbayar Bayasgalan, 6, of Arlington, Virginia.

A fall scene. We’d like to see what you can draw!

Write about your favorite season of the year.
Meet the Capital Weather Gang

The Capital Weather Gang is lead by Jason Samenow, The Post’s weather editor and CWG chief meteorologist, and by Angela Fritz, an atmospheric scientist and The Post’s deputy weather editor. They answer our questions about covering the weather with accuracy and clarity, working as a team and pursuing a career in meteorology.

Q. What are your sources for weather information?

JS: We rely primarily on two types of weather information: observations and computer model forecasts.

The observations include data from weather stations on the ground and balloons released into the air that include temperature, wind, pressure and precipitation measurements. These data help us know what’s happening where. We also rely on radar imagery – so we know where precipitation is occurring and moving, and satellite imagery – so we know where the clouds are and where they’re moving.

Computer model forecasts come from the National Weather Service and international weather agencies, which provide simulations of where weather systems are going to move and how severe they’re going to be.

AF: Our main source is the National Weather Service and other agencies under the National Oceanic and Atmospheric Administration. These are the government services that run the forecast models, satellites, radars and weather stations that we use to create forecasts and communicate with the public.

Q. What roles do observation, mathematics, computer-based weather prediction models, and satellite data play in your weather forecasts?

JS: These are all critical tools in helping us construct a forecast and communicate to our different audiences what’s happening with the weather.

AF: Observations, weather prediction models and satellite data play a crucial role in our daily forecasts. Without these sources of information, we wouldn’t be able to tell you if it was going to rain or snow or be sunny tomorrow. Mathematics is critical in order to understand how the atmosphere works, so even though we’re not doing calculations every day, math is at the very core of weather forecasting.

Q. Members of the Capital Weather Gang have different areas of expertise. When do you call on each other to write or co-write a forecast?

JS: Our team includes experts in winter weather (Wes Junker), severe thunderstorms (Jeff Halverson), and hurricanes (Brian McNoldy). We rely on these experts to provide rich insight into these hazards so our audiences understand what conditions to expect and how to prepare. These experts also provide important historical perspective that helps us learn from past extreme events.

AF: We’re fortunate to have more than 20 members with different interests and expertise. Sometimes our members pitch stories to us — other times, we see
something happening in the news and we ask the relevant expert to help us explain to readers what’s going on.

**Q. When writing a weather forecast, how do you balance technical knowledge with clearly and accurately conveying information to readers?**

**AF:** Having technical knowledge is necessary, but that doesn’t mean the end user needs to hear all about it. We understand that most people want to understand what the weather impacts will be — icy roads, flooded yards or power outages, for example. We try to keep the deep, technical explanations to a minimum, except where it’s particularly interesting, or when we’re specifically writing for a technical audience.

**JS:** Clear communication has to be our first priority. We can have a perfect forecast, but if it’s not well-explained and people don’t understand it and take the right actions, it is a failed forecast. We try to write our forecasts in plain English, leading with key messages. Then, for those who are interested in more technical detail, we provide that deeper down in our stories. But we always try to break down complex topics in ways people can understand.

**Q. At what time do you send text to The Washington Post for publication of local weather on The Weather page or to WAMU for broadcast?**

**AF:** We write our morning forecasts the night before, and publish them at 5 a.m. each morning. For the evenings, we typically provide a short “PM Update” by 5 p.m.

**Q. What has been your most interesting and challenging weather event to cover?**

**JS:** Snowstorms tend to pose the most challenging and interesting events to cover. Because of the enormous impact snow has on our region, snarling traffic and frequently closing schools and businesses, there is a huge demand for our snowstorm forecasts. There is a lot of pressure to be right because people are making important decisions based on our forecasts. But predicting snow in Washington is hard because we’re frequently right on the rain-snow line where just a small change in temperature can have a huge effect on how much snow falls and where.

**AF:** The D.C.-area blizzard in January 2016, was particularly interesting and challenging. Because we knew the roads would be impassable and Metro was closing, we needed to stay at the hotel around the corner from the newsroom in order to cover it. It was fascinating to see the record-setting event unfold across the D.C. region.

**Q. What benefit is there to knowing weather conditions in another part of the U.S.?**

**JS:** Weather systems travel from one location to another and are interconnected so it’s important when forecasting in a particular area to understand its history and how it fits into the overall weather pattern.

**AF:** We cover national and world weather stories in addition to the D.C. region, so it’s imperative that we
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understand all kinds of weather phenomena. Without that knowledge, we wouldn’t be able to explain these events clearly.

Q. How are the U.S. and international cities that are listed on The Weather page selected?

JS: These were selected long ago based on population data and where our readers live and travel.

AF: Our newspaper weather reports are provided by Accuweather. We have very little involvement with these.

Q. Television and radio stations have procedures to alert viewer/listeners to approaching dangerous weather conditions. What do you do to inform Post readers?

AF: We use various methods, including email alerts and Washington Post mobile app alerts as well as social media sources like Twitter and Facebook.

JS: The Washington Post can issue news alerts across digital platforms when there is a severe weather watch or warning issued, and we can use social media to blast out the message. The Capital Weather Gang has very large audiences following it on Twitter and Facebook.

Q. Does being a weathercaster require special credentials?

AF: Anyone can be a forecaster, but if you want to be good at it you should probably get a bachelor of science degree in meteorology. This will include rigorous math and physics courses along with the standard meteorology curriculum, including things like atmospheric dynamics, thermodynamics and forecasting. Without this degree, it would be very hard to get a job in weather — people want to hire real meteorologists these days.

JS: The majority of forecasters in broadcast and digital media hold some sort of meteorology degree. They have the tools and skills to do their own forecasts and communicate them with confidence and authority.

A minority of television “weathercasters” have degrees in other areas like broadcast journalism and have learned about meteorology on the job or taken a few classes. They may rely more on the National Weather Service than doing their own forecasts.

Q: Many of the Capital Weather Gang are trained in meteorology. What are the advantages of being trained in meteorology?

JS: Having meteorology training helps you understand the science well enough so that you can explain it well to your audience. The degree also helps you hold credibility — which is important for building audience trust.

Q: What classes and major in college do you recommend?

JS: If you're interested in meteorology, you need to take and succeed in math and science classes. Those are the core classes needed to obtain a meteorology degree. You can earn a meteorology undergraduate degree and/or major in math or science as an undergraduate and then go on for a graduate degree in meteorology. Computer programming is also very important for meteorology, especially if you want to go into weather research. If you're interested in weather communication like television or writing, journalism and public speaking classes are critical.
The Washington Post’s Capital Weather Gang

Jason Samenow is the Washington Post’s weather editor and Capital Weather Gang’s chief meteorologist. He founded CapitalWeather.com in early 2004, the first professional weather blog on the Internet which was absorbed by The Post in 2008 and became the Capital Weather Gang, which he has since led. A native Washingtonian, Jason Samenow has been a weather enthusiast since age 10 (1987). Before graduating from high school, he interned for NBC4 chief meteorologist Bob Ryan. He earned a master’s degree in atmospheric science, and spent 10 years as a climate change science analyst for the U.S. government. He holds the Digital Seal of Approval from the National Weather Association.

@capitalweather

Angela Fritz is an atmospheric scientist and The Post’s deputy weather editor. She received her B.S. in meteorology from Valparaiso University, and then attended the Georgia Institute of Technology for her M.S. in earth and atmospheric science. While at Georgia Tech, she focused on hurricanes and climate change, and the intersection of the two. Angela has previously worked as a meteorologist at CNN and Weather Underground.

@angelafritz

Dan Stillman is a meteorologist and editor for the Capital Weather Gang. The excitement of snow days and two-hour delays are what first got him hooked on tracking lows and highs across the country. After graduating from Walt Whitman High School in Bethesda, Md., he went on to earn a B.S. in atmospheric, oceanic and space sciences from the University of Michigan. He earned an M.S. in Meteorology from Texas A&M University.

@stillmand

Ian Livingston is a forecaster/photographer and information lead for the Capital Weather Gang. While in college in New England, Ian was trained as a SKYWARN spotter, and his self-education in meteorology has been ongoing since he first witnessed snow at his childhood home in the southern California desert. During college, he created a website focused on forecasting upcoming weather conditions on and around campus. By day, Ian is a defense and national security researcher at a D.C. think tank.

@islivingston

A. Camden Walker is engagement lead, meteorologist. From striving to learn all of the cloud types, reading almanacs, and earning the weather merit badge, today he wants to engage further with an audience curious about how weather influences them and why the atmosphere behaves as it does. Camden has a bachelor’s in atmospheric science from the University of Virginia and on-air training at The Weather Channel.
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Daily Forecasters
Brian Jackson Meteorologist (Sunday)
Greg Porter Meteorologist (Weekend P.M.-Updates)
Matt Rogers Meteorologist (Tuesday)
David Streit Meteorologist (Thursday)

(Team leaders Jason Samenow, Dan Stillman, Camden Walker, and Ian Livingston are the Monday, Wednesday, Friday and Saturday daily forecasters, respectively)

Experts
Jeffrey Halverson Severe Weather
Wes Junker Winter Weather
Joe Kunches Space Weather
Brian McNoldy Tropical Weather

Writers and Photographers
Kevin Ambrose Senior Writer/Photographer
Matthew Cappucci Photographer
Blaine Friedlander Astronomy Writer
John Hopewell Earth Science Specialist/Writer
Phil Klotzbach Tropical Weather Specialist/Writer
Kathryn Prociv Writer/Meteorologist
Jordan Tessler Graphic/Map Designer
Jack Williams Writer

For more information about the Capital Weather Gang, go to their Washington Post website:
The Capital Weather Gang Reports the Weather

The Washington Post provides several means to convey weather information. Severe weather watch and warnings can be issued across digital platforms.

Print and Online
- Articles written by Jason Samenow and Angela Fritz and members of the Capital Weather Gang appear in print and online.
- THE WEATHER, the last page of the METRO section provides local, national and international weather information.
- Visit the Capital Weather Gang on Facebook www.facebook.com/capitalweather
- Follow the Capital Weather Gang on Twitter Check out these accounts: @capitalweather, @angelafritz, @stillmand and @islivingston
- Go to The Washington Post’s Personal Weather Station KDCWASHI185 https://www.wunderground.com/personal-weather-station/dashboard?ID=KDCWASHI185#history

Articles and Approaches Vary on washingtonpost.com

Ian Livingston | Forecaster/Photographer and Information Lead

FALL | September 2017
Today’s clouds were a little slow to erode under an increasingly weak mostly fall sun. Once they did, conditions turned glorious. Skies are now mostly sunny as we head into the evening. Clear is going to be the story Wednesday, and the day after … and … well, probably for a long while.

Tomorrow (Wednesday): We kick off a tame stretch of weather that features tons of sun and warm temperatures. It’s standard September, but definitely on the toasty side at times. There could be a patch or two of morning fog, especially near water. Otherwise, sunshine rules and temperatures head for at least the mid-80s. Some upper 80s seem a good bet as well. If it wasn’t for a lower sun angle and less humidity, it might feel as if August is back.

Dan Stillman | Meteorologist and Editor

A somewhat subjective rating of the day’s weather, on a scale of 0 to 10.
7/10: Kind of fun to hang on to summer sun, though starting to feel too hot for the calendar.

EXPRESS FORECAST
Today: Mostly sunny and warm. Highs: Mid-to-upper 80s.
Tonight: On the muggy side. Lows: Mid-60s to near 70.
Tomorrow: Partly to mostly sunny, warm. Highs: Mid-to-upper 80s.

FORECAST IN DETAIL
Fall arrives Friday afternoon, at 4:02 p.m. to be exact. But summer weather has set up shop for the foreseeable future. Now, it’s not the midsummer kind of heat and humidity. But we’re plenty warm straight through the weekend, with highs well into the 80s and some mugginess to boot.
What’s THE WEATHER?

The state of the atmosphere with respect to wind, temperature, cloudiness, moisture, pressure, etc. Weather refers to these conditions at a given point in time (e.g., today’s high temperature). Climate refers to the “average” weather conditions for an area over a long period of time (e.g., the average high temperature for today’s date).

SOURCE: National Weather Service Glossary

Locate THE WEATHER page in the Metro section. You will need this page to respond to the following questions.

1. In the upper left corner, a weather brief gives a quick summary of the forecast. Write an informative one-sentence summary of today’s weather.

2. In the center of the page an even briefer weather forecast is provided.
   a. What are the expected high and low temperatures for today?
   b. What will be the warmest day this week?
   c. What does “FEELS” mean?
   d. How helpful are the weather symbols or icons?

3. Find the listing of selected U.S. cities.
   a. Which will the three warmest cities today?
   b. Which will be the three coldest cities today?
   c. What do you note about the location of these two groups?

4. Find the listing of selected world cities?
   a. Which will the three warmest cities today?
   b. Which will be the three coldest cities today?
   c. What do you note about the location of these two groups?

5. Find the regional weather information.
   a. What does the map indicate about general weather conditions?
   b. The regional weather information is divided into three groups: Blue Ridge, Atlantic beaches and Waterways. Why do you think these three areas were selected?
   c. Who would be interested in the pollen and air quality information?
   a. Find the key to the Temperatures chart. What information
does this one informational graphic provide?
   b. For the two week-period indicated, what was the record high
temperature?
   c. Are forecast temperatures higher or lower than the average
temperatures?
   d. What actual temperature has been the highest in this time
   period? On what day did this take place?
   e. What actual temperature was the lowest in this time period?
   On what day did this take place?

7. Below the Temperatures chart, additional information is given
   for the three area airports.
   a. Why are these airports used?
   b. Select one of the airports. Create a chart that shows the
normal temperature, the record high and record low. Add to
this chart, yesterday’s high and low temperatures.

8. Where do you find information about the sunrise and sunset?
   a. If you need 30 minutes to drive to a park to take
   photographs of the sunrise, by what time do you need to
   leave your house?
   b. If you want to be home one hour before sunset, what time
   will you be home?
   c. Who might use the information about the rise and setting of
   the moon?
   d. Why is information provided about Mars, Jupiter and
   Saturn?

9. Information is given about the phases of the moon. Other than
   photographers, who needs or uses this information?

10. Information is provided about Today’s Tides.
    a. What do the towns that are listed have in common?
    b. High tides are indicated in boldface. To whom is this
information helpful?
KidsPost Photo Gallery

Severe Weather Events

A woman with her two children walk past debris left by Hurricane Irma in Charlotte Amalie, St. Thomas, U.S. Virgin Islands, on September 10. The storm ravaged such lush resort islands as St. Martin, St. Barts, St. Thomas, Barbuda and Anguilla.

Hurricane Irma takes its toll on Caribbean Islands and United States

- Find the islands mentioned in the caption on a map.
- What clues are provided in the photograph to inform you about the power of hurricanes?
- What do you think children who live on these islands will need?
Buildings damaged by hurricane Irma are seen on the British Virgin Islands on Sunday.

Curious residents visit the Southernmost Point marker in Key West, Florida, on Saturday. Tropical storm-force winds from Hurricane Irma began hitting the Lower Florida Keys around 2 p.m. with a forecast of landfall late Saturday night.
Floodwaters begin to rise in neighborhoods as Hurricane Irma arrives in Bonita Springs, Florida, on Sunday.

U.S. Coast Guard personnel load bottled water on the USCGC Joseph Tezanos vessel in San Juan, Puerto Rico, on Sunday to take to St. Thomas, U.S. Virgin Islands, which was affected by the storm.