

# Take A Cloud Walk



Your discovery  
guide to  
observing and  
identifying clouds



A Take a Walk  Book

Jane Kirkland

## Acknowledgements

I'd like to thank our technical reviewers for their guidance and advice: Jim Cantore of The Weather Channel® and Bob Swanson of USA Today, Also Jack Wooldridge for the illustrations from his own cloud book.

Take A Cloud Walk

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## About the Author

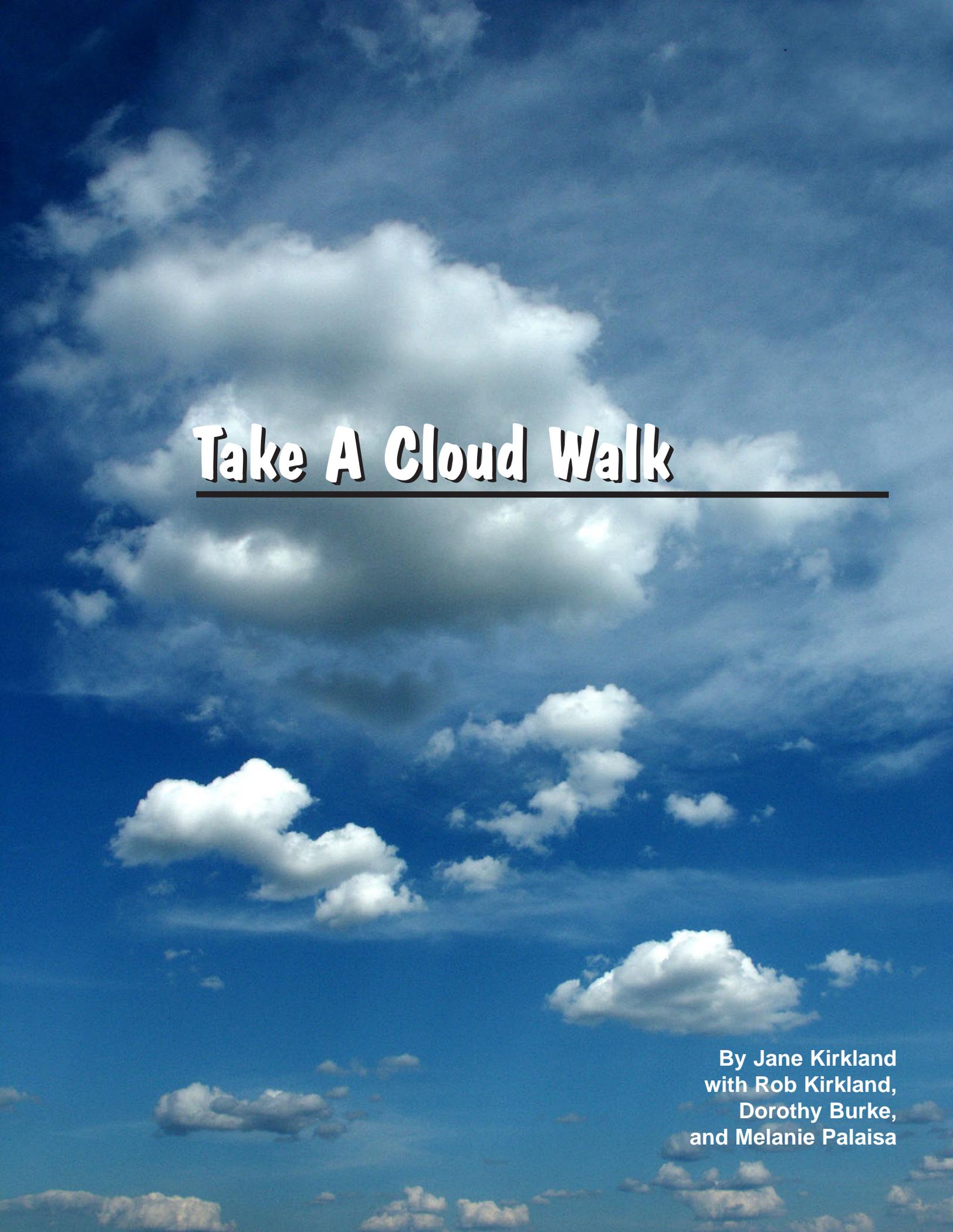
Jane Kirkland is becoming America's favorite Citizen Scientist. Her journey from a best-selling computer book author to an award-winning nature book author is as extraordinary and inspiring as it was unplanned. It all began one heart-stopping moment when she unwittingly spotted a Bald Eagle soaring over her grocery store's parking lot. That incredible journey was the impetus for her series of **Take A Walk® Books** and is the basis of her school assembly programs and keynote addresses.

This award-winning author, motivational speaker, photographer, and columnist has been featured on Animal Planet and PBS TV and National Public Radio and at Disney's Epcot Center. She has spoken at international events such as the Philadelphia Flower Show, and at important educator events such as the Pennsylvania Governor's Institute for the Environment and Ecology. Jane is a mesmerizing speaker whose love of nature is infectious to both juvenile and adult audiences.

Jane and her books have been reviewed, featured or written about in many major magazines and news sources including Parents, Parenting, Learning, Green Teacher, and Ranger Rick magazines and the Philadelphia Inquirer and Copley News Service.

Learn more about Jane, her books, and her work at [www.TakeAWalk.com](http://www.TakeAWalk.com) and at [www.NoStudentLeftIndoors.com](http://www.NoStudentLeftIndoors.com)

**Flesch-Kincaid Grade Level: 5.8**



# **Take A Cloud Walk**

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**By Jane Kirkland  
with Rob Kirkland,  
Dorothy Burke,  
and Melanie Palaisa**

# Are You Ready to Discover Clouds?

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**Y**ou are about to set out on a cloud walk. This may be the easiest nature walk you'll ever take because clouds are easy to see. If there are clouds in the sky, you can see them by looking out a window of your house, you can see them while you are riding in a car or bus, and you can see them when you go outside and take a cloud walk.

A cloud walk can be a very short walk. You don't even need to walk at all—you can stand still, sit back, or lie on the grass. You don't need binoculars, you don't need a telescope, you don't need a field guide—you just need clouds!

Taking a cloud walk with a friend or family member is a lot of fun. With two or more, you can play the cloud game while you are looking at the clouds.



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*You can take a cloud walk any time of the year—even in the winter! Clouds are always changing and every time you take a cloud walk you'll see different clouds.*

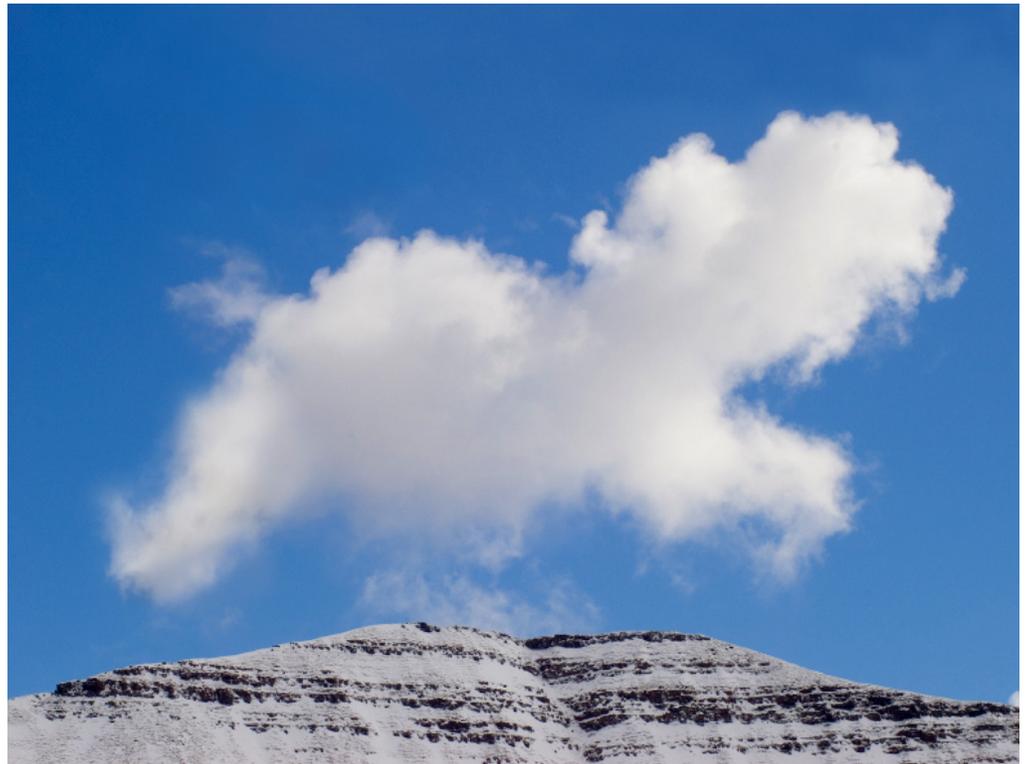
# Have You Ever Played the Cloud Game?

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**W**hat is the cloud game? I used to play it with my brothers and sisters. We would lie on the grass in our yard and watch clouds. Everyone would take turns finding clouds that looked like other things. When it was your turn, you'd find a shape among the clouds and say something like "I spy a heart in the sky" and then the other kids would have to find that shape, too.

One day, my brother said "I spy Maggie in the sky". Maggie was our dog—she was a beagle. As soon as he said it, the rest of us saw it, too. It was so funny that a cloud looked like our dog Maggie. I wish I'd had a camera on that day. We laughed so hard. I'll never forget seeing Maggie in the sky!

I never again saw a cloud that looked like my dog. But I have seen lots of clouds that looked like other animals. One day I even saw an elephant cloud!



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*This cloud doesn't look like my dog Maggie but it sure looks like a dog jumping over a mountain. Can you see it?*

## What to Wear

A cloud walk can be as short as 15 minutes or as long as several hours. People often say "Time flies when you're having fun," and time will fly when you take this cloud walk! If you think you'll be outside for more than just a few minutes, remember to protect your skin from the damaging rays of the sun. You can get a sunburn even on a cloudy day!

If you take a cloud walk in the winter when it's very cold, be sure to bundle up in layers of warm clothes and to wear shoes or boots that will keep your feet warm and dry.

# Meet Three Basic Cloud Types

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**W**hen you see a cloud, how can you tell what type of cloud it is? By observing two **characteristics**: the first is the cloud's physical appearance. The second is how high a cloud is above the earth. These two things then help us determine the cloud's type.

Let's start with the cloud's appearance. Clouds can be thick and white, dark and gray, or thin and nearly transparent (see-through). They can be round, oval, tall or flat. They can be large or small. There are three basic cloud types. They are:

**Stratus** (STRAT-us). Stratus clouds are low, flat sheets of clouds that look like one huge cloud covering the whole sky. Stratus means layer.

**Cirrus** (SEAR-us). Cirrus clouds are high, thin, wispy, and feathery. Cirrus means wisp of hair.

**Cumulus** (KEW-mew-lus). Cumulus clouds are large, rounded, fluffy, cottony-looking clouds. Cumulus means heap, or pile.

## New Word?

**Characteristic**  
(kar-ik-ter-RIS-tik)

*An important, unique, or special feature.*



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**Stratus clouds are found at the low and middle levels of the sky. Stratus clouds look like flat sheets of clouds covering the sky. Did you know that fog is a stratus cloud?**



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**Cirrus clouds are high in the sky. If there are many cirrus clouds in the sky it may be a sign that the weather will change in the next 24 hours.**

# Do You See Any In the Sky?

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*Cumulus clouds are perhaps the prettiest of clouds. They are found at the low and middle levels of the sky. They are large, rounded, fluffy clouds that look like cotton balls. The word cumulus means “heap” or “pile”.*

## **Take a Minute**

*I like to tell everyone I meet that they should “Take a minute to be in it™”. The “it” I’m talking about is nature. I believe we should all take a minute every day to look at clouds, at birds, at plants, trees, insects, and the other things in nature that surround us. No matter where we are, taking a minute to look, hear, and smell nature is good for our souls.*

*Nature can make us feel relaxed, happy, and sometimes even excited. The more you look, the more you’ll see. So even on days when you don’t have the time to take a cloud walk, you can still “Take a minute to be in it™”.*

## **What Do You See?**

*Do you see any of these kinds of clouds in the sky? Sometimes you can see different types of clouds in the sky at the same time. The sky is always changing. Clouds form, clouds break up, and new clouds form. Every time you look at the sky it is different.*

# How High is High?

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**A**ltitude is how high something is above the earth's surface. Clouds can be high in the sky way above the earth, low in the sky or in the middle of the sky. What does that really mean?

Generally speaking, an altitude of 6,000 feet or less is low level. That means a plane or a cloud in the sky at 6,000 feet or less above the earth's surface is at a low altitude. A middle altitude is more than 6,000 feet but less than 20,000 feet above the earth's surface. An altitude of 20,000 feet or more is a high level altitude.

Sometimes different clouds can be seen in the sky at different levels. Other times, the sky is filled with just one kind of cloud at low, middle, or high levels. Because you are here on the ground and the clouds are in the sky, you can't know how high they are—you can't really know their altitude. But you can tell if the cloud is low in the sky, high in the sky, or in the middle of the sky by just looking at them.



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*Several cloud types can occur in the sky at one time. The puffy clouds in this picture are cumulus clouds. The flat clouds are stratus clouds.*

# Measuring Altitude



I like to fly above the clouds. These clouds look like a huge bed made of cotton. It seems as if you could walk on them.

## Measuring Altitude

How can you measure altitude? One way is with an instrument called an altimeter. Altimeters are found in airplanes so pilots can see, at all times, how high they are flying their planes.

By knowing their altitude, pilots can be sure to fly high enough above buildings. When two planes are in the same area of the sky, they fly at different altitudes so they don't crash and can pass over or under one another safely. Wind and weather are often different at different altitudes. So if winds are causing a bumpy plane ride, the pilot might change to a different altitude—higher or lower—to find calmer air.

Pilots might also change altitudes to fly above or below the clouds. Have you ever flown in a plane above the clouds? That's an awesome experience!

The altimeter here shows the plane is flying at 25,000 feet.



# Altostratus and Altocumulus Clouds

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**D**o you remember the three basic kinds of clouds? Stratus clouds are flat and layered and usually found in the lower altitude of the sky. Cumulus clouds are fluffy and heaped and usually found at the lower and middle levels of the sky. Cirrus clouds are wispy and found at the higher altitudes.

Clouds come and go as the sun heats the earth. The sun and wind make clouds move. Clouds can even be different in the morning than in the afternoon. And because clouds move with the wind, they can change before your eyes!

But sometimes clouds can be at different altitudes than usual. For example, stratus clouds, usually low, can also be at middle altitudes. When they are, we call them **altostratus** clouds. Alto means middle. And altostratus means stratus clouds at the middle levels of the sky.

When cumulus clouds are at the middle levels of the sky they are called **altocumulus** clouds.

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*Altocumulus clouds are cumulus clouds at the middle (alto) levels of the sky. Notice how these clouds look like a large layer, group, or patch of little, puffy, cotton ball clouds.*

## Share Your Experiences

Do you know someone who might enjoy taking a cloud walk with you but who can't come along? Perhaps your grandparents can't get around very well, or maybe you know someone who is ill or disabled. They can enjoy your walk if you share this book with them and your stories about the discoveries you made when you took your cloud walk. Or you can sit together near a window to watch clouds, look for shapes, and identify them.

## Become a Citizen Scientist

If you like looking at clouds you can help scientists by becoming a Citizen Scientist. Citizen Scientists make observations and provide information about those observations to real scientists. There are many Citizen Scientist programs you can join such as one for observing birds, one for pigeons, and one for frogs. Each of these programs is sponsored by a different organization. NASA has an observation program for clouds. To learn more, visit:

<http://asd-www.larc.nasa.gov/SCOOL>



# Cirrostratus and Cirrocumulus Clouds

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**T**he word *cirro* means high. What do you think we would call stratus clouds that are high in the sky? We call them **cirrostratus** clouds. Did you guess correctly?

Cirrostratus clouds often contain a lot of dirt and dust. If the sun is shining, the combination of the dirt, dust, sunlight and cirrostratus clouds can create a sort of halo, or rainbow-like circle in the sky.

Cumulus clouds at high levels are called **cirrocumulus**.

## Web Weather for Kids:

Learn what makes weather wet and wild, do cool activities, and become hot at forecasting the weather on Web Weather for Kids!

<http://eo.ucar.edu/webweather>



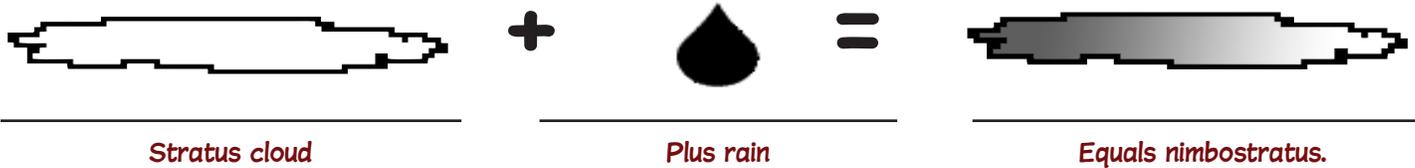
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See the halo? It is formed by the sunlight, the dust, and the cirrostratus clouds. Cirrostratus clouds are a sign that rain will come in the next 12-24 hours.

# Nimbostratus Clouds

The word nimbus means rain. Another form of the word nimbus is nimbo. So if a cloud contains rain, sleet, snow, or hail, we add the nimbus or nimbo to its name.

A stratus cloud that produces rain, sleet, or snow is called a **nimbostratus** cloud. Nimbo is a form of the word nimbus.



**Nimbostratus clouds are dark, gray clouds that form a layer across the sky. Nimbostratus clouds are found at low or middle levels of the sky.**

## Who Named the Clouds?

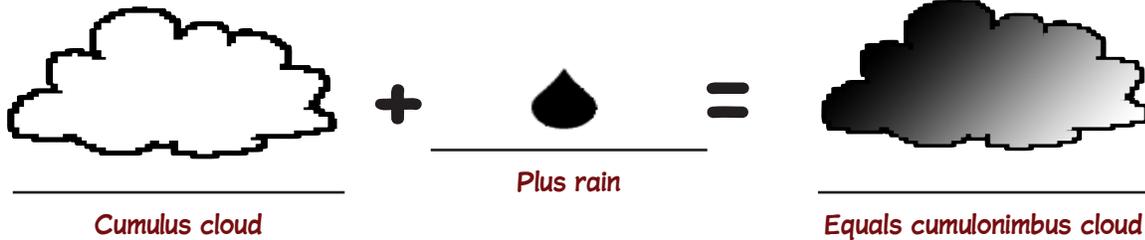
Who came up with these names for clouds? A man named Luke Howard. Luke enjoyed observing the sky and writing about his observations (hey, just like you and me). He devised a system of classifying clouds similar to the way scientists classify plants and animals, using Latin names for the classifications. Before Luke came along with his naming system in 1802, scientists didn't have a good way to classify clouds.

I think the most interesting part of Luke's story is that he was a chemist, not a weather person. Clouds were his hobby—not his profession. This just goes to show you that a good idea is a good idea no matter who thinks of it! To learn more about Luke Howard, [Google® his name](#).

So, have you had any good ideas today?

# Cumulonimbus Clouds

A cumulus cloud that produces rain is called a **cumulonimbus** cloud. That word is a combination of the words cumulo (a form of the word cumulus) and nimbus.



Cumulonimbus clouds are tall, dense thunderclouds. They can appear alone or in large groups. They can get so large that their bottoms are at low altitude while their tops are at very high altitudes, above 40,000 feet. That's eight miles high!

## Clouds Are Cool (Part I) by Rob Kirkland

Clouds are formed when air cools. Air contains water vapor, which is invisible. Warmer air can hold more water vapor than colder air. When warm air rises, it becomes cooler and some of the water vapor condenses, forming water droplets or ice crystals. Water droplets and ice crystals are visible, and appear as clouds. Once a cloud is formed, if it continues to cool, the water droplets will become too heavy to stay up in the air. When that happens, the water droplets fall as rain, ice or snow.

# Clouds Bring Rain and Sleet

**C**louds produce many kinds of **precipitation**, such as snow, rain and hail. Here's how it works: particles in the air, such as dust, soot, or smoke, create a center around which ice crystals collect. When the ice crystals get too large and heavy to be carried by the clouds, they fall to the ground. On the way down, if the air gets warm enough, they might melt. So they can fall in the form of rain, snow, sleet, or even hail—depending on the season and the temperature.

## New Word?

### Precipitation

(pri-sip-i-TAY-shun)

*Water falling from the sky in the form of rain, hail, sleet, or snow.*

**Rain** is water droplets that fall from the sky and splash when they hit the ground. To be called a raindrop (instead of fog, or mist, or drizzle) a water droplet must be at least 0.5 millimeters (mm) across - that's about 0.02 inches! Raindrops can get about as big as 3 mm (or about 0.13 inches).

**Freezing rain** is rain that falls as a liquid but turns to ice when it hits something cold, like the ground or your car window.

**Sleet** is rain that partially freezes because it falls through a layer of cold air (below freezing) just before it reaches the ground. In the winter, you may see both sleet and rain falling, sometimes mixed with snow.



*Here's a view looking up at raindrops as they fall. Pretty cool, no?*

# When Not to Take a Cloud Walk

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**T**hunderclouds cause thunderstorms. Thunderstorms can be very scary but, at the same time, beautiful. Thunderstorms produce lightning. Lightning happens when the rising and falling air particles and falling ice and rain particles collide with one another and become electrically charged. The electrical charges build up and when positive and negative charges collide—lightning occurs. Lightning can happen within a cloud or between a cloud and the earth.

Thunder is the sound of lightning. Light travels faster than sound so you see lightning before you hear it. Sometimes you see lightning but don't hear thunder. That's because sound can't travel as far as light. If you hear thunder but don't see lightning, that's because the lightning is obstructed by the clouds. When there is thunder, there is always lightning. So if you hear thunder, get indoors. Don't stay outside and don't stand under a tree because a tree can be positively charged and attract the negatively charged particles from a thunderstorm. When this happens lightning occurs and KABOOM!



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*This lightning is like a huge question mark in the sky. Huge. Really huge.*



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*If the sun shines during or after a storm you might see a rainbow like this one. A rainbow is the reflection of sunlight bouncing off water drops in the air.*

# My Two Favorite Words: "Snow Day!"

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**S**now flakes weigh less than sleet and they fall more slowly to the ground. Snowflakes form when the temperature is below freezing. As many tiny ice crystals form and collide with each other they form the six-sided shapes of snowflakes. No two snowflakes will ever look the same—each one is unique (hey, just like you!). Big, fluffy snowflakes are formed when many snowflakes stick together as they fall to the earth.



Every snowflake is unique. Snowflakes are difficult to photograph. Why? Because they melt too quickly! If you want to take snowflake photos, try freezing black construction paper. Take photos as the snow falls onto the paper.



If you have a specially designed snowflake photomicroscope you can take photos of snowflakes like these by Kenneth G. Libbrecht. See more of his photos and learn about his snowflake book at [www.snowcrystals.com](http://www.snowcrystals.com).

## More Weather

*Fog* is a cloud that touches the ground. It is dense and makes it difficult to see very far in front of you. It occurs when there is a lot of moisture in the air and the air is cool nearer the ground. Fog often gathers in low-lying places. Some places, like San Francisco, are famous for being foggy.

*Mist* is similar to fog, only it isn't as dense so you don't have as much difficulty seeing.

*Haze* is a brownish tint to the sky made of dust, smoke and other pollutant particles in the air. It usually occurs in drier conditions, so haze is not a true cloud. A summer haze might consist of particles of pollen in the air. Ahhh-chooo!

# Hail, Hail, Let's Stay Inside

**T**here are some days when the weather is bad and you shouldn't take a cloud walk. Don't go outside in a thunderstorm or hailstorm.

Have you ever seen hail? Hail is formed in the tallest thunderclouds and only during hot weather. Hail starts out as water droplets that freeze as they are swept up and down by the strong winds in large clouds. As small hailstones move from warmer, lower altitudes into the higher, colder air, they collect water, which freezes. Hail gets larger each time it is bounced from warmer to colder temperatures. Hail will stay in the clouds until it grows too large and heavy. Then it falls to the earth.



*Very large hail can form only in the windiest thunderclouds, the same kind of thunderclouds that sometimes form tornadoes. A tornado is a rotating column of air that forms in a cumulonimbus cloud.*

## Delicious Hail?

To get an idea of how hail is created, dip some strawberries into hot, melted chocolate.

Of course, you need an adult to help you with this experiment. You'll need hot melted chocolate and some big, fresh, juicy strawberries on toothpicks or forks. Once you're set up, you simply dip the strawberries into the chocolate.

Each time you dip the strawberry into hot, melted chocolate, the chocolate coats the strawberry. When you lift the strawberry out of the chocolate, air cools the chocolate and hardens it. If you dip again, more chocolate coats the strawberry and then hardens when you lift it up. The more you dip, the thicker the chocolate coating becomes. Hmmm!

Even if you already understand that hail is formed as water droplets that freeze and are swept up and down in large cumulonimbus clouds, this is still a fun and tasty experiment!



# Take Field Notes

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## Field Notes:

Use this space to write about the clouds you see and to record information about the weather. You can draw clouds here or take a photo of them to paste onto this page.

Date and time:

What season is it?

What is the temperature?

Is it raining or snowing?

What else do you notice about the weather?

Draw the clouds you see and label them here:

## What to Write

Your field notes should contain information specific to this day and this cloud walk. For example, write about the weather. Is the sun shining? Is it raining? If there is snow, write down how deep it is. What time of the day are you observing? Record the season and the current temperature if you know it.

## Why Are Clouds White?

Sunlight reflects off the water droplets or ice crystals in a cloud. Sunlight is made of up the seven colors of the rainbow. When all the colors are reflected at the same time, you see white light. Do you know the seven colors of the rainbow? See the inside back cover of this book for the answer.

# Write a Journal

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## My Journal:

Use this space to write a story about your cloud walk. You can write about the clouds you see but you can also write about the other things you see, such as birds, trees, flowers, and insects and any observations you make about how the weather affects them. For example, are the birds puffing up their feathers to keep warm? Are the butterflies basking in the sun? Are the trees swaying in the wind? You can also use this space to draw the things you see.

# Meteorologists and Climatologists

**Y**ou and I aren't the only people who watch clouds. Clouds tell us a lot about the weather; and weather affects everyone. If we know what the weather will be, we know how to dress for the day. Farmers need to know if it will rain so they know if they have to water their crops. Government workers need to know if it's going to snow so they can be prepared to plow the streets.

People who study the weather are **meteorologists**. Some meteorologists become weather reporters working for the TV news, newspapers, radio stations, or reporting on the Internet. They keep us informed about what's happening in the weather and how we can prepare for bad weather if necessary.

Some meteorologists study the climate. What's the difference between the weather and the climate? Well, weather is the short-term (hourly, daily, weekly) conditions of precipitation, sunshine, cloud cover, temperature and humidity. But climate is the average weather conditions for a particular region over a long period of time—a minimum of 30 years. Meteorologists who study climate are called **climatologists**.

Two famous meteorologists helped me to learn about clouds so I could write this book. I'm very grateful to them for helping. Jim Cantore is a TV celebrity who reports for the Weather Channel®. Bob Swanson writes for the USA Today newspaper. Learn more about them on the facing page.

## New Words?

### Meteorologist

(mee-tee-er-OLL-uh-jist)

*Someone who studies meteorology.*

### Meteorology

(mee-tee-er-OLL-uh-gee)

*The science of weather and the climate.*

## Poets

Carl Sandburg was one of our greatest writers and poets. He was born in 1878 and died in 1967. Here is his poem called "Fog":

*The fog comes on little cat feet.  
It sits looking over harbor and city on silent haunches and then moves on.*

Another great poet was Percy Bysshe Shelley, who lived from 1792 to 1822. I hope you enjoy this from his work called "The Cloud":

*I bring fresh showers for the thirsting flowers,  
From the seas and the streams;  
I bear light shade for the leaves when laid in their noonday dreams.*

To learn more about these writers, visit your library or do a Google® search for their names.

# My Favorite Meteorologists

## Meet Bob Swanson

Meteorologist Bob Swanson is one-half of the team of “The Weather Guys” for the USA Today newspaper. He is also a singer and songwriter and released a whole CD with his own weather songs—how cool is that? I asked Bob why he became a meteorologist. Here’s what he said: *“Growing up on a mountain ridge in south central Pennsylvania, I always looked forward to snowstorms and the chance for a snow day. One blizzard piled so much snow on our driveway that we had to hire a front-end loader to clear it, and it seemed that my brother and I went sledding every day for weeks! Years later I became a science teacher and was just as eager for a snow day when flakes were forecast. So I returned to college to study meteorology, I found out how difficult it is to accurately forecast snow amounts and locations. I even wrote a song, Snow Day, about my experiences as a student, teacher and forecaster.”*

You can learn more about Stormin Bob Swanson at: [www.storminbobswanson.com](http://www.storminbobswanson.com)



## Meet Jim Cantore

Jim Cantore is a meteorologist on TV’s Weather Channel®. He is the host of Storm® Stories, a program about real-life storm survivors. Often, Jim reports the weather from right within the middle of hurricanes, ice storms, floods, and blizzards! I asked Jim what was the weirdest weather experience he’s ever had. His answer will surprise you and make you laugh. He said: *“My weirdest weather story was when I showed up to do a live TV shoot in Alabama to cover a hurricane. But when I got there, the sun was out and it stayed out the entire time I was there! Talk about the storm falling apart! Our camera crew went swimming that night in the*

*ocean. I wish that all coverage of storms would work out that way.”*

You can learn more about Jim Cantore at: [www.weather.com/aboutus/television/ocms/cantore.html](http://www.weather.com/aboutus/television/ocms/cantore.html)

## Meet Kathy Orr

Kathy is the Chief Meteorologist at KYW CBS 3 TV in Philadelphia. I watch Kathy on TV almost every day! She has won several Emmy Awards for her reporting of blizzards, floods, tornadoes and hurricanes. Kathy told me her most thrilling weather adventure was Flying with the Hurricane Hunters into Hurricane Ivan. She said, *“My photographer and I were on the last flight into Ivan. It was classified as a category 5 storm, the most powerful on the Saffir-Simpson Hurricane Scale. Ivan was set to make landfall the next morning. We flew for ten hours and I broadcast live from the cockpit of the C130 aircraft. We traveled into the eye of Hurricane Ivan ten times. It was an amazing sight! I don’t like to fly and it was a surprisingly smooth ride.”*

Learn more about Kathy at: [www.cbs3.com](http://www.cbs3.com)



# Let's Review

**D**o you think you have the hang of cloud names? Would you like to put it to the test? Let's review some of the new words you've learned. The three red words in the table to the right are three cloud types. The green word tells us whether a cloud contains precipitation. The two blue words, when added to the red words, tell us the altitude of a cloud.

Clouds found at low levels include cumulus, stratus, stratocumulus, and cumulonimbus. Although the bottoms of cumulonimbus clouds are at low altitudes, they can be very tall and their tops can be at very high altitudes.

Clouds found at middle-levels include altocumulus and altostratus and nimbostratus.

Clouds found at the highest levels include cirrus, cirrostratus, and cirrocumulus.

Word	Meaning
Alto	Middle
Cirro	High
Cirrus	Wisp of hair
Cumulus	Heap
Nimbus	Rain
Stratus	Layer

Use these words, combinations of these words, or forms of these words to name the clouds you see in the photos on this page and the next. Write the cloud name on the line below the pictures.



1. \_\_\_\_\_

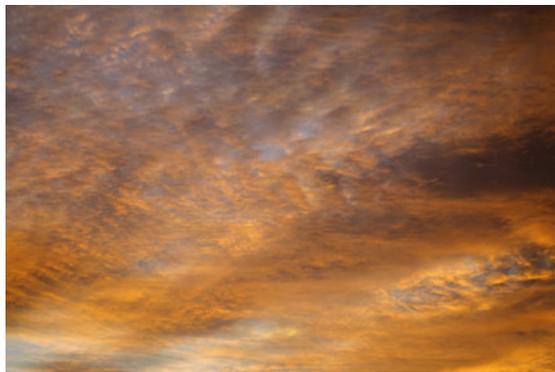


2. \_\_\_\_\_

# Let's Identify



3.



5.

## Riddle #2

Why was there  
thunder in the lab?

Because the  
scientists were  
brainstorming!



4.

## Riddle #1

What happens when it rains cats and dogs?

You must be careful not to step in a poodle!



6.

## Clouds Are Cool (Part II)

By Rob Kirkland

Here's the coolest thing of all about clouds: They make air visible. When you look at the blue sky, what do you see? Nothing much, right?

Because air is invisible—good thing, too, or we wouldn't be able to see anything but the air. But clouds are really nothing much more, themselves, than visible air. Think about it. A cloud is made of ice crystals or water droplets, suspended in the air. They were formed right there when the air got colder. And if the air warms up again, it will re-absorb the water and ice, and the cloud will disappear again. So the next time you look at a cumulus cloud, think about this: what you are seeing is the air itself blowing around up there. How cool is that?

# Clouds and Climate Change

Everyone knows that we are experiencing climate change and that the earth is warming up. Are clouds affecting global warming? Well, did you ever notice that it is often warmer on a cloudy morning than it is after a clear sky at night? That's because, in addition to sunlight, the earth receives warming energy from the atmosphere, including clouds. But sometimes you get a shiver during the day when clouds are moving overhead. Why aren't the clouds warming the atmosphere then? Because clouds can also have a cooling effect by reflecting sunlight back into space. So, are clouds keeping us warm or cooling us off? Both.

Some scientists believe that warmer temperatures from climate change will help to evaporate more water from the earth. This would make the clouds denser and brighter and help them to reflect more sunlight back into space, helping to cool things off here on our planet. But NASA (the National Aeronautics and Space Administration) studies have shown that when air temperatures are higher, clouds are thinner and less capable of reflecting sunlight. NASA says that the bottoms of clouds rise with warmer temperatures but the tops of the clouds stay the same, so clouds become thinner.

Only time will tell us whether clouds can help keep the planet cool or if they will make global warming worse by keeping us warm.

Climate change is happening. It's important that all of our planet's citizens learn about climate change and about the things we can do to help keep our planet from getting too hot.



*I was fortunate to learn a lot about climate change when I was invited to a three day training course by former Vice President, Nobel Peace Prize Winner, and author, Al Gore.*

## Recommended Book About Climate Change

*"Down-to-Earth Guide to Global Warming" by Laurie David and Cambria Gordon. Published by Orchard Books.*

*This book explains global warming in very understandable terms. It's fun to read. It's filled with suggestions on what kids can do at home, in school, and in their neighborhoods to help combat global warming. It is recommended for ages 9 to 12 and you can find it at your local library, bookstore, or at our Amazon bookstore at [TakeAWalk.com](http://TakeAWalk.com).*

## Recommended Website

Visit the Environmental Protection Agency's (EPA) website on global warming to learn more: [epa.gov/climatechange/kids](http://epa.gov/climatechange/kids).

# Climate Change and You

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I suspect that for the rest of my life and maybe the rest of yours, we'll all be learning about climate change and learning to live with the changes.

In the meantime, scientists and climatologists are studying and watching what's happening with climate and coming up with new ideas about what we can do. I'm trying to help by turning off lights when I don't need them, recycling, being less wasteful, printing my books on recycled paper, turning down the heat and air conditioning, and riding my bike instead of driving my car when I can. What are you doing?



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*Climate change and global warming will certainly have an effect on our animals that live in our polar regions like polar bears in the north, and penguins like these in the south.*

# Red Skies at Night

## Want More Folklore?

To learn more about weather folklore, Google® “weather folklore” or search for books at Amazon.com by searching for “weather folklore”.

## Cloud and Weather Websites:

Click on Hows & Whys to read answers to interesting weather questions at:

[www.usatoday.com/weather](http://www.usatoday.com/weather)

Find general weather information and links to other information (try choosing Clouds or Blizzards) at:

[weather.about.com](http://weather.about.com)

See pictures of clouds that look like animals at:

[www.cloudgazing.com](http://www.cloudgazing.com)

See pictures of different cloud types at:

[www.scienceclass.com/dayscape](http://www.scienceclass.com/dayscape)

**W**eathermen aren't the only ones who predict the weather. Sometimes we do. Have you ever heard this expression? “Red skies at night, sailor's delight. Red skies in the morning, sailors take warning.” This weather belief (not the actual saying) goes as far back as the Bible (Matthew 16, 2-3).

This old saying has a lot of truth to it. Before we had modern equipment to steer a ship to safety, sailors took their weather readings from the sky. If the sky is red at night, it usually means that dry weather is on its way—so it's safe to sail. If the sky is red in the morning, it means the dry weather has already passed, and there may be rain or storms on the way. On a red-morning day, a sailor could be heading out to bad weather.

But there are a lot of weather beliefs that are just plain old folklore, traditions, sayings, or old beliefs and there is no truth to them (see facing page). If you want to learn about the weather, watch the weather station on TV and get some books on weather from the library.



*Red skies at night—here's a photo I took in Cape Cod, Massachusetts. Clouds look especially great at sunset when the sun shines on their undersides.*

# Other Weather Predictors

**C**an animals predict the weather? Some people think so. Some believe pigs get very restless and toss their heads about if a storm is approaching.

My Mom used to tell me that if the cows in the fields were lying down, rain was on its way.

Some people believe the Woolly Bear Caterpillar stripes predict the weather: if the brown stripes are wide, the winter will be mild, and if the brown stripes are thin, the winter will be harsh.

Punxsatawney Phil is a real groundhog (each time one dies, they name a new one "Phil") who lives in Punxsatawney, Pennsylvania. Phil is awakened each Groundhog Day at a big celebration. It is said that if Phil sees his shadow, winter will last another 6 weeks, but if he sees no shadow, spring is on the way!



Can pigs, cows, Woolly Bear caterpillars and a groundhog named Punxsatawney Phil predict the weather? What do you think?

## Cricket Predictors

Some people say you can tell the outside temperature by listening to a cricket chirping. Count the number of chirps in a 15-second period, add that to the number 37, and you'll get the current outside temperature.

## Recommended Books About Weather

**"How the Weather Works"** by Michael Allaby. This is a great book! It has lots of experiments and projects designed to help you learn more about the elements that make up the weather.

**"Can It Really Rain Frogs: The World's Strangest Weather Events"** by Spencer Christian and Antonia Felix (John Wiley & Sons, 1997) relates some of the secrets of clouds, has chapters on tornados and hurricanes, and talks about thunder and lightning.

**"The Weather Book"** by Jack Williams (Vintage Books, 1997) has color weather pictures and graphics with clear explanations.

# I Spy Shapes in the Sky!

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**C**umulus clouds—those white, puffy clouds—can take on odd shapes and sometimes look like other things. If we use just a little imagination, clouds can look like even more things! Check out the photos on these two pages. What do you see in each photo?

Do any of the clouds you see today look like animals? Do any of them look like people you know?

Speaking of imagination—when you are taking your cloud walk, imagine for a moment that you could float among the clouds. What would it feel like? What would you see from up there?

Here's what I see in the clouds on this page. I see hearts, hearts, and more hearts.

On the next page, in the left column, I see Aladdin's lamp, a hummingbird, a rabbit, and a monster. In the right column I see a fish, a donut, a bearded man wearing a hat, and an angel. What do you see?



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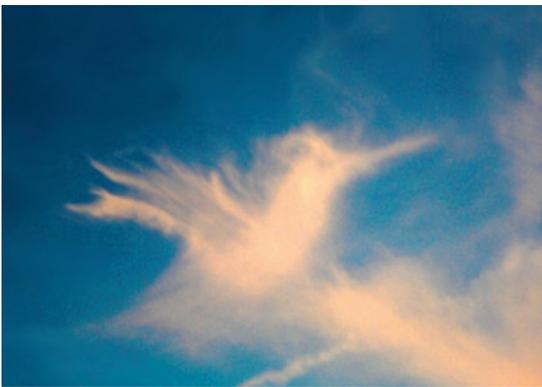
*The top and middle heart-shaped clouds were formed naturally. But the bottom heart-shaped cloud is an example of skywriting. Skywriting is when a small plane, specially equipped to make smoke—makes shapes or writing in the sky.*

# Animals, Hearts, and More. Oh My!



## Make a Tornado in a Jar

Ask your librarian or science teacher to help you locate books on creating a tornado in a jar.



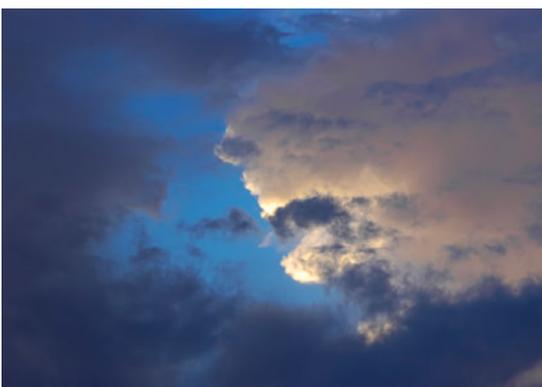
## Build a Crystal Snowflake

Build a crystal snowflake with Borax. You'll need help from an adult. For instructions Google® "build Borax snowflake".



## Keep a Weather Journal

Create a weather journal every day by recording temperatures, wind direction, and wind speed from the TV weather news, local newspaper, or from your own weather instruments. Write your weather observations every day.



# Write Your Own Cloud Book...

**M**y friend, 10-year-old Jack Wooldridge, wrote and illustrated his own book about clouds. I really like what he did and I've put a few of his cloud book pages here for you to see. Maybe you'd like to write a book about clouds, too.

## Creating Your Own Book

It's easy to make your own book. Start by making a first draft, or what some kids call a "sloppy copy". If you are going to draw pictures, you might want to wait to draw them in your final copy. Use your sloppy copy to write just the text (words) but leave space for your drawings to fit in later.

Next, edit your sloppy copy. That means that you carefully read it to make sure that your sentences are complete, that your spelling is correct, and that your text makes sense. After you finish editing your sloppy copy, you can either use it as your final copy or use it to copy over again onto clean paper so you don't have any eraser marks or mistakes on the final copy.

Now add your drawings. You can draw right on the paper that contains your text or you can draw on other paper and then paste it into your final copy.

Next, you can put page numbers on your book. Congratulations! The inside of your book is finished.

Finally, it's time to make your cover and put the title of your book on the cover. You should also put your name on the cover so everyone will know who wrote the book. When you're finished, you can say that you are now an author!



**Cumulus clouds** are clouds you would see on a sunny day. They are big and puffy. They are low in the sky and are always changing shape. These are the ones you will probably see things in.



**Altocumulus clouds** are like huge cumulus clouds and let out rain and snow. They are also in the middle of the sky.

# Just Like My Friend Jack

**J**ack has a great sense of humor. As you can see, his illustrations of cloud types are fun. He also included cloud myths and cloud sayings. Of course, these are only a few pages from Jack's book. But I think they are a good example of how much fun it can be to write a book about clouds.



Stratocumulus are low in the sky and look like rolls of blackish and blueish clouds. They are often seen in the winter.



If people don't seem to know what they are doing, it is said: "he's got his head in a cloud" or "she's in a fog"

## When is a Cloud Not a Cloud?

"On cloud nine" is an expression that means extreme happiness. If I say I'm "Walking cloud nine" it means I'm so happy that I feel like my feet aren't even touching the ground and I am walking high in the clouds. The feeling would be a very, very happy "TMTH" (too much to handle).

A cloud can also mean something gloomy or dark, like when things are not going well in your day and you need to get "out from under the cloud".

If something is "cloudy" or "clouded" it's not clear. Have you ever heard someone say "he used clouded judgment"?

A cloud can be visible pollution or dust in the air such as haze and smoke. Have you ever heard the expression "up in a cloud of smoke"? Of course, that kind of cloud is not a real cloud in the meteorological sense.

And have you ever heard your mother say, "Get your head out of the clouds"? What do you think that means?

# Stop! And Start Again

**W**hen you finish your cloud walk don't forget to write about your experiences. You can use your field notes or write on blank paper. Writing about your experience will help you to remember the fun and interesting things you discovered during your walk.

Cloudwatching is a wonderful hobby that you can pursue throughout your entire life, everywhere you go. If you enjoyed this walk, take it again and again because there's always something new to see. Whenever you see clouds, take another cloud walk. With your new knowledge you could become an expert cloudwatcher!

I hope you discovered lots of clouds today. I especially hope that you saw interesting shapes and maybe even a hummingbird, fish, or doughnut cloud! Today you became an observer of your environment. Congratulations!

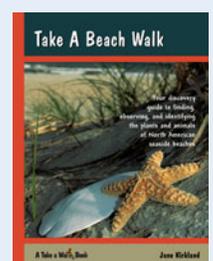
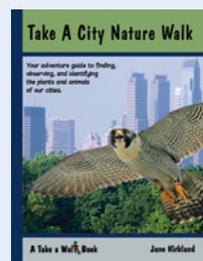
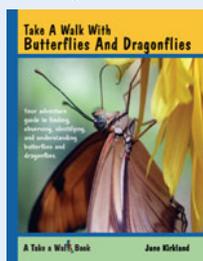
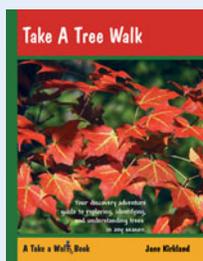
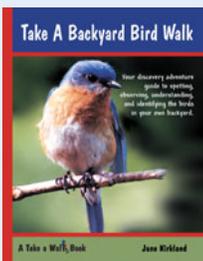
If you enjoyed this walk, you might enjoy some of our other books, like those pictured below. You can find these other books in your local library and you can buy them at your favorite bookstore, at your favorite online bookseller, or at our website, [www.TakeAWalk.com](http://www.TakeAWalk.com).

Thanks for joining me on this cloud walk. Whenever you are outdoors be sure to stop and observe clouds and all of the nature around you. You can make great discoveries all year round—winter, spring, summer, and fall. When you don't have the time to take a nature walk, try a short nature break even if it only lasts one minute. Like I say, nature is everywhere and you should "Take a minute to be in it"™ every day. If you do, you'll see something new each and every day of your life!

See you in the outdoors!

*Jane*

## Take A Walk® Books Award-winning nature discovery books at [www.TakeAWalk.com](http://www.TakeAWalk.com)



Answers to colors of the rainbow, page 16: red, orange, yellow, green, blue, indigo, and violet.

Answers to cloud identification, pages 20 and 21:

1. Cumulonimbus
2. Fog
3. Cumulus
4. Cirrus
5. Nimbostratus
6. Altostratus and Cirrocumulus

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Page 28

Illustrations by Jack Wooldridge

Page 29

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*Take a Cloud Walk* takes you on an adventure in your backyard, schoolyard, or neighborhood to discover and learn about clouds. Learn the basic names and shapes of clouds, what makes clouds move, why clouds are white, how clouds affect climate change, and more!



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