
Junior Science Book of
Rain, Hail, Sleet, and Snow

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Clouds Tell the Story

Look at the sky above you. Today it is clear blue. Tiny clouds drift across like feathers on parade. Far across the pond, great white clouds are rolling up. They seem to pile on top of each other to make a boiling mountain above the trees.

Farmers are watching those clouds. Air pilots are watching, too. They know that clouds can bring rain, hail, sleet or snow.

Weathermen watch the clouds day and night. To them the clouds tell a story. When clouds are heavy and black, they say, "A storm is coming."

Sometimes a cloud will twist like a giant rope on end. That means: "Tornado!" And weathermen send out a warning.

For years men looked at the clouds as ants do - from underneath. No one had seen a cloud from above.

Then the airplane was invented. Men could fly into the clouds. Like birds, they saw fluffy white clouds all around them.

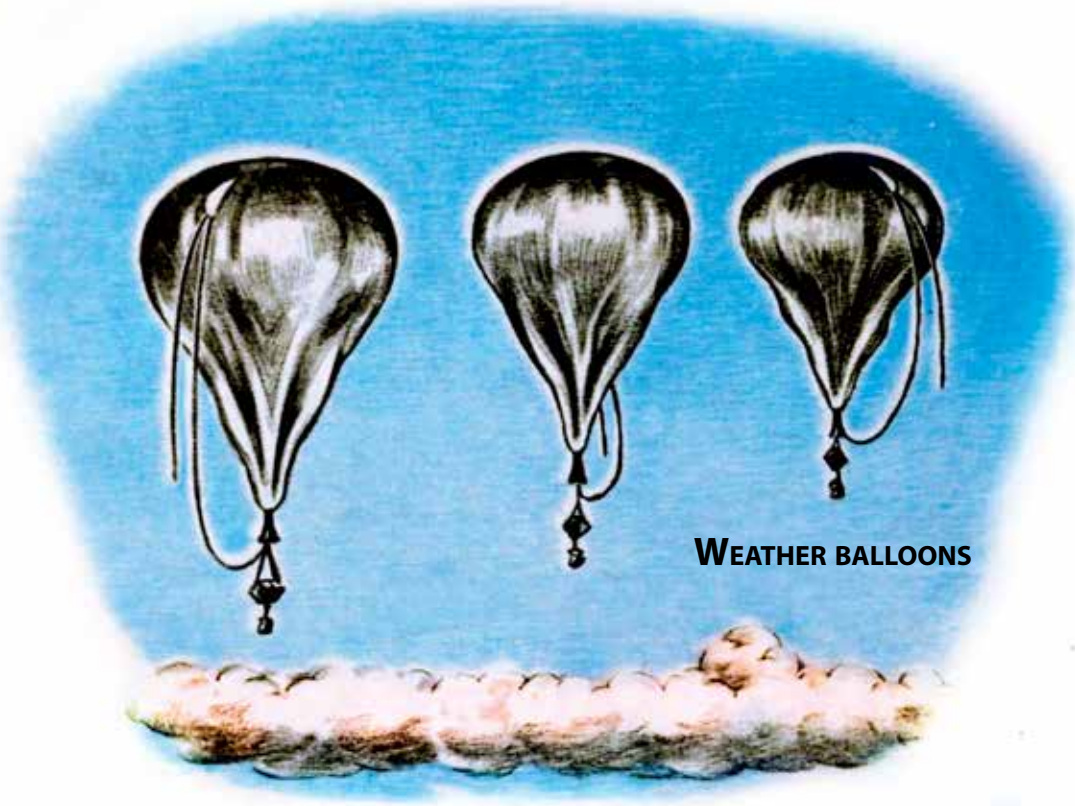
Often they flew over the clouds. As they looked down, they saw a sea of white. Sometimes it looked like a sea of soapsuds. Always floating. Always moving.

Sometimes a hole would break in the clouds. An air pilot could see the rivers and mountains of

Sometimes a hole will break in the clouds.

the earth. Then the hole would close. Once more clouds made a blanket that hid the earth.

From the earth we can see only part of a cloud. We don't know how high it is. We don't know how wide it is. Most important, we can't see all the clouds coming toward us.



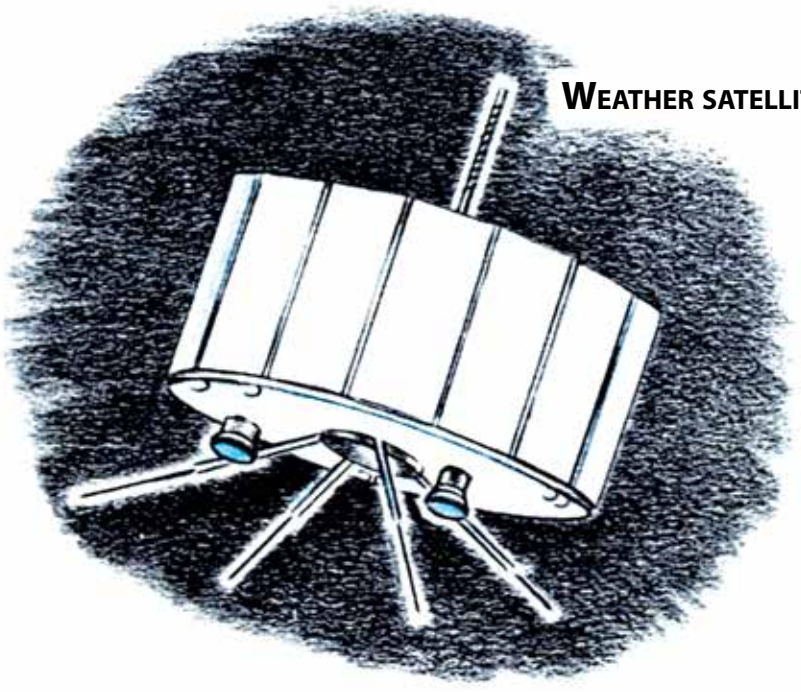
BALLOONS CARRY INSTRUMENTS TO REPORT THE WEATHER.

From the air we can learn more. So weather stations began sending up airplanes to get reports on the clouds. They sent up balloons, too, to get reports on the clouds.

That was fine in good weather. But in bad weather, airplanes and balloons have trouble. A heavy storm can bring a balloon down. But weath-

ermen want to know what happens in a heavy storm. They want a report from above the clouds, even in bad weather.

Today they are getting weather reports from outer space. One of the man-made satellites takes pictures 400 miles above the earth. It works like a



Weather satellite, Tiros I

This man-made satellite sends back pictures of clouds.

TV camera taking pictures as it goes around the earth.

Some pictures are 800 miles wide and 800 miles long. One picture shows the clouds from New York to Chicago. Then comes a picture of clouds from Chicago to Denver. In a flash, weathermen see more clouds than they ever saw before.

All Kinds of Clouds

When you breathe out on a cold day, you make a cloud.

When your teapot begins to boil, a cloud appears over the spout.

These are tiny clouds, of course. But they are real clouds.

When you drive into a heavy fog on the road, you are driving into a cloud. It is a cloud resting on the earth.

Sometimes a cloud rests on top of a mountain. If you climb to the top, you are inside the cloud. You can't see the valley below. You can't see the sky above. The cloud is all around you.

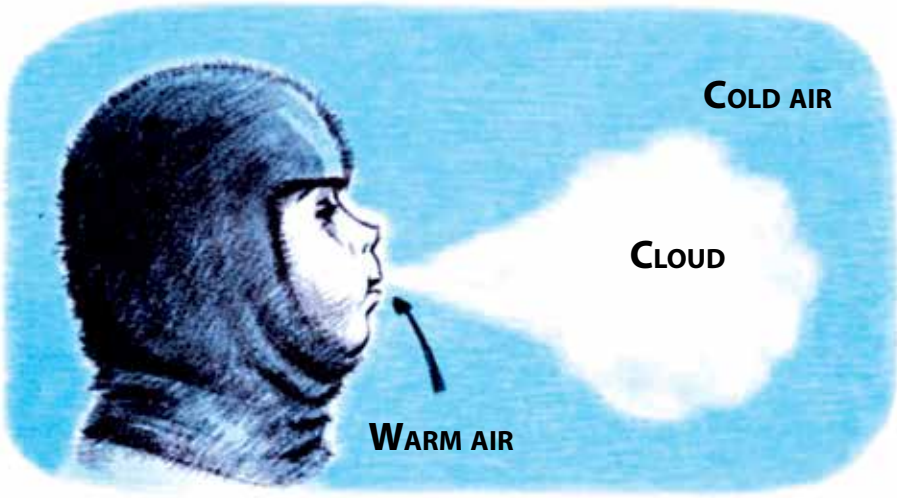
Some people call it a fog. And that's what fog is - a cloud resting close to the ground.

Almost every summer morning we see fog over our pond. It seems to rise like a thin cloud of smoke.

This is because the moist air over the pond is warm. At night the land cools more than the water. So the air above it is cool. Warm air from the pond meets cool land air. Moisture turns to the tiniest drops of water. These droplets are so tiny we can hardly imagine what they are like. But they make the air look cloudy.

That is what happens when you breathe out

on a cold day. Your breath is warm, of course. When it meets the cold air outside, tiny drops of moisture show up. They make a cloud.

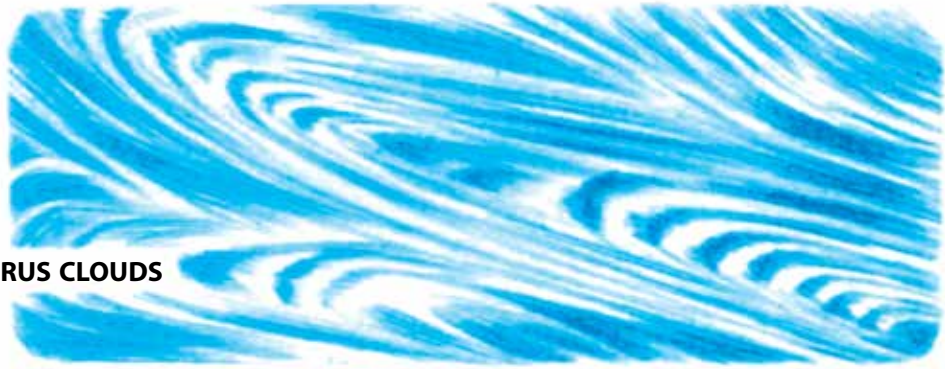


Warm moist air from the teapot meets cooler air in your kitchen. So the moisture forms little droplets. They make a cloud in the kitchen.

When you look at a cloud in the sky, you are looking at millions and millions of these tiny droplets. For a cloud starts out as moist air. As it cools, moisture begins to form tiny drops. They

cling to bits of dust in the air. The cloud rolls up like smoke.

On a clear day, find a big open space and look high in the sky. Do you see some clouds that are like thin streaks or curls?



Cirrus clouds

It seems as though an artist's brush has swept across lightly. A touch here and a touch there. Because these clouds are light and curly, they are called *cirrus* clouds. (*Cirrus* means curl or tuft.)

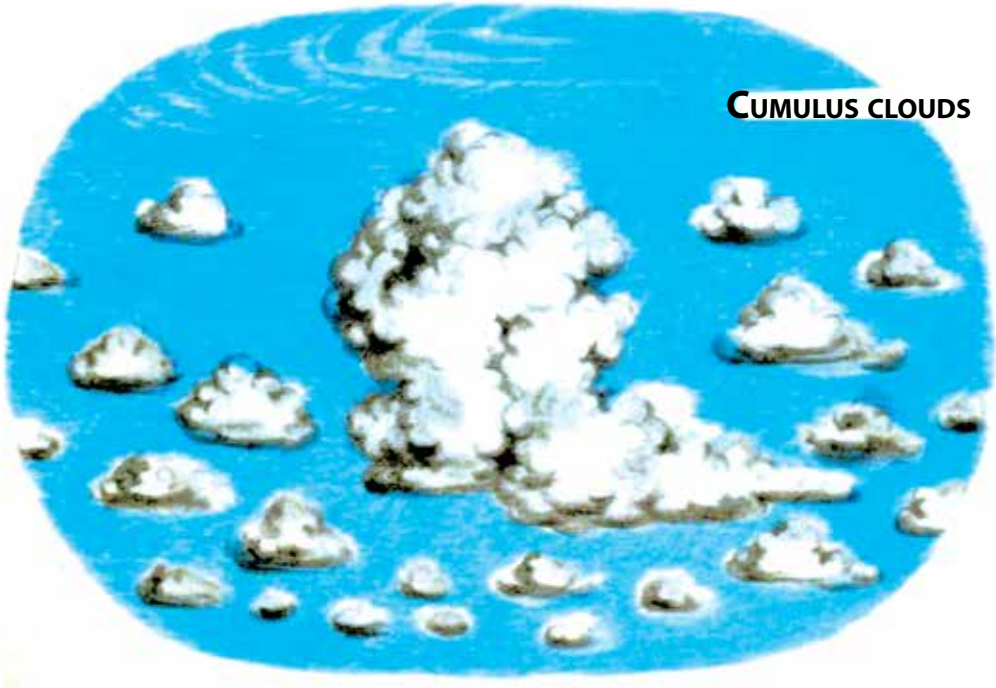
Cirrus clouds are very high in the sky, perhaps four miles or more. It is so cold up there that

cirrus clouds contain tiny ice crystals instead of water droplets.

Often we see cirrus clouds ahead of a storm.

Lower down in the sky, you may see much bigger clouds pushing up. At the top they may look like giant balls of cotton. At the bottom they are flat. All the time they seem to be swelling and boiling up. They may be two or three miles from bottom to top.

These are *cumulus* clouds. On a sunny after-



Cumulus clouds

noon, these clouds are likely to be white. The tops may shine in the sunlight. We might call them "fair-weather" clouds.

But sometimes cumulus clouds turn into black storm clouds. Then they reach as high as three or four miles into the sky. Often they bring thunder and lightning as well as rain and hail.

Storm clouds

Stratus clouds

Sometimes the sky seems covered by a gray sheet. You see no blue sky. You see no white clouds. Streaks of gray cover all. It is as though layers of fog had lifted from the earth to the sky.

The gray sheet is really a low cloud. This is called a *stratus* cloud.

As clouds change, the weather is apt to change.