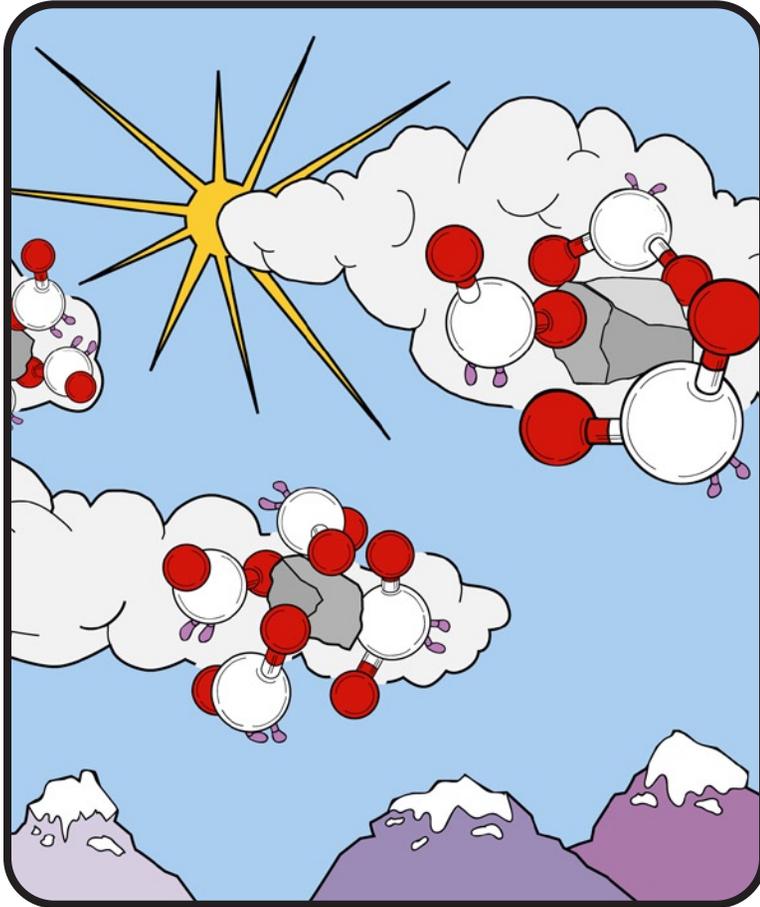


Molly Q's Adventure

A Science A-Z Earth Series

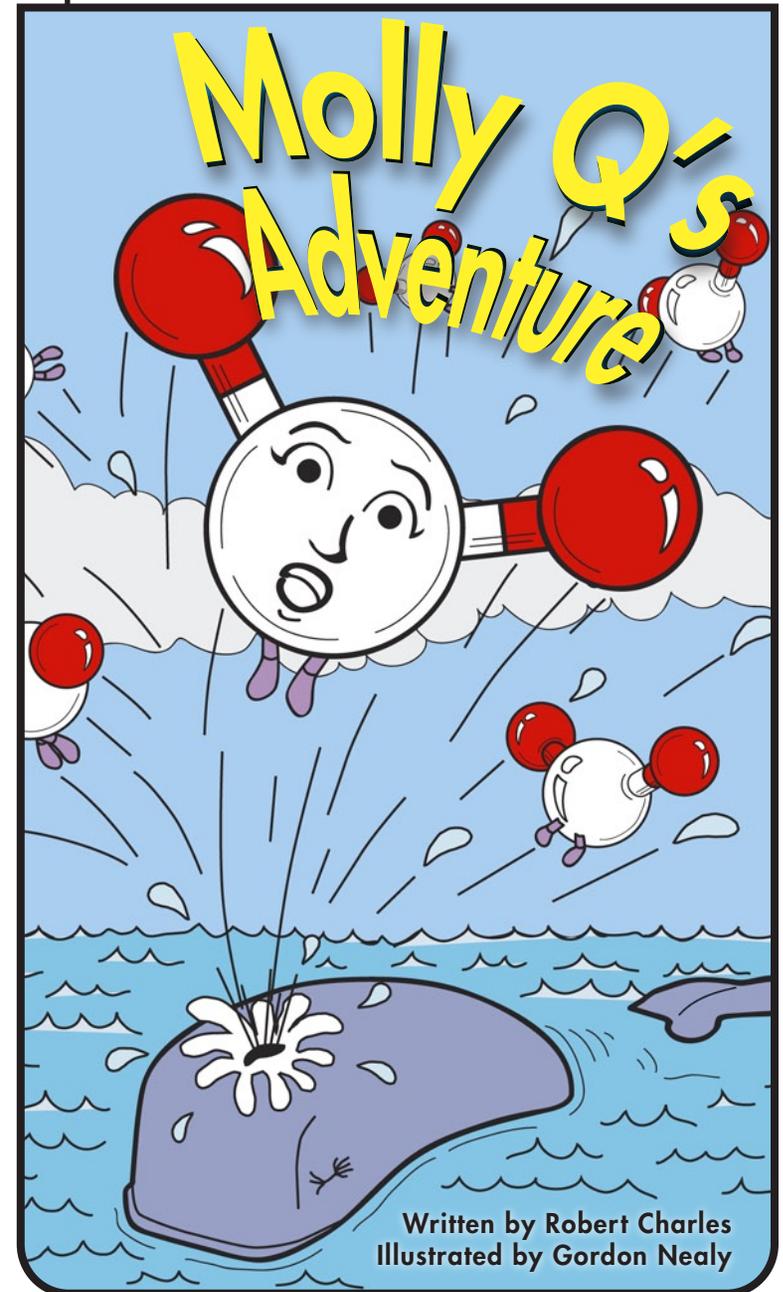
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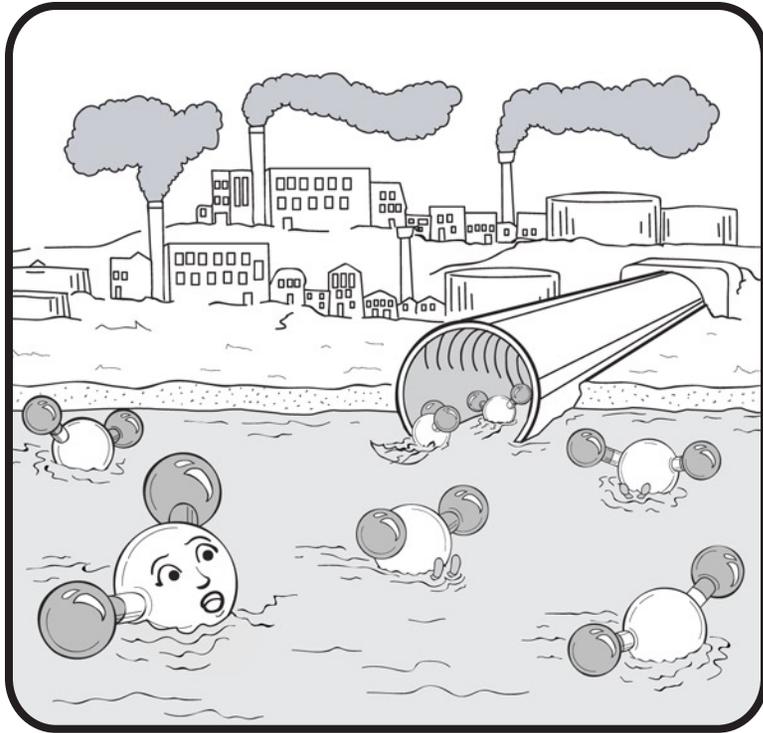
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Molly Q's Adventure



Written by Robert Charles
Illustrated by Gordon Nealy

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KEY ELEMENTS USED IN THIS BOOK

The Big Idea: Understanding the water cycle is crucial to understanding how what we do—polluting, farming, damming, using, wasting, conserving—affects everyone's water.

Key words: adapted, aquifer, atmosphere, cloud, condensed, cycle, delta, deposit, droplet, Earth, energy, environment, evaporated, flowed, floating, froze, gas, gravity, groundwater, gullies, hail, ice, liquid, molecule, ocean, phases, precipitation, pressure, raindrops, river, rivulet, runoff, sediment, stream, surface, thunderhead, trench, vent, water, watershed, water vapor

Reading strategy: Visualize

Other suitable reading strategies: Retell, connect the text to prior knowledge, ask and answer questions

Suitable comprehension skills: Sequence events, main idea and details, summarize information, cause and effect, evaluate style

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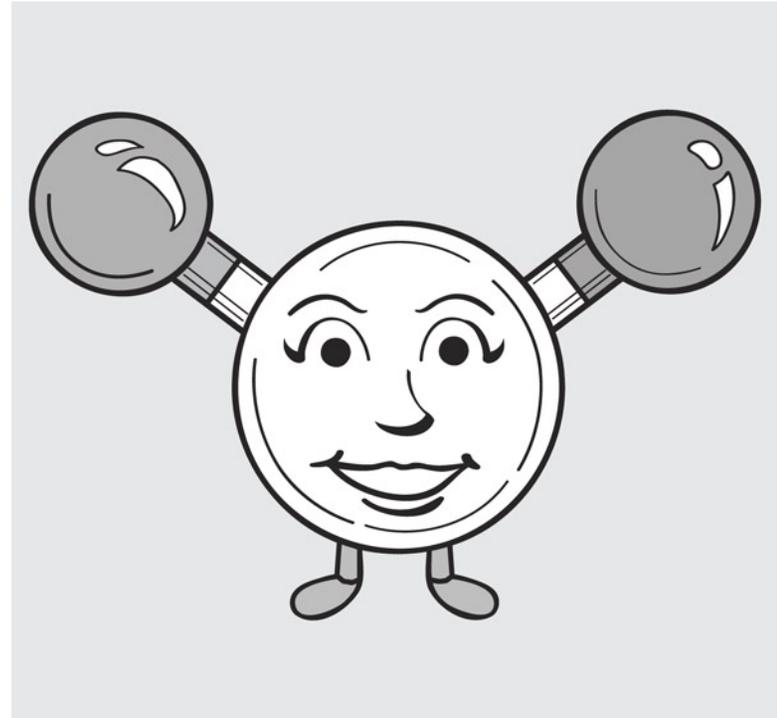
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Meet Molly Q

What's your life like? Is it straight and wide like a highway? Is it up and down like a roller coaster?

My life is a cycle. No matter where I go, no matter what I do, sooner or later I am right back where I started.

My name is Molly Q. You can call me Molly. You have seen me, and billions like me, every time it rains. I'm a water **molecule**.





Did you see my name? Molly Q. Molecule. Get it? A molecule is the tiniest part of something that's still the same thing. And we water molecules are everywhere.

You're made of water—about 60%, in fact. Your parents are mostly water. Your friends are mostly water. The President and the Vice President and his pet dog and the grass in front of the White House are mostly water. Every living thing on Earth is mostly water.

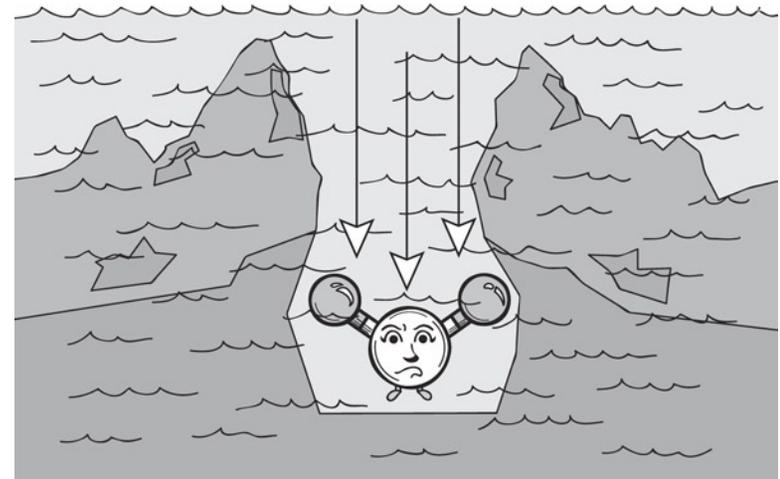
But to get back to me, I would like to tell you about my adventures on my last cycle.

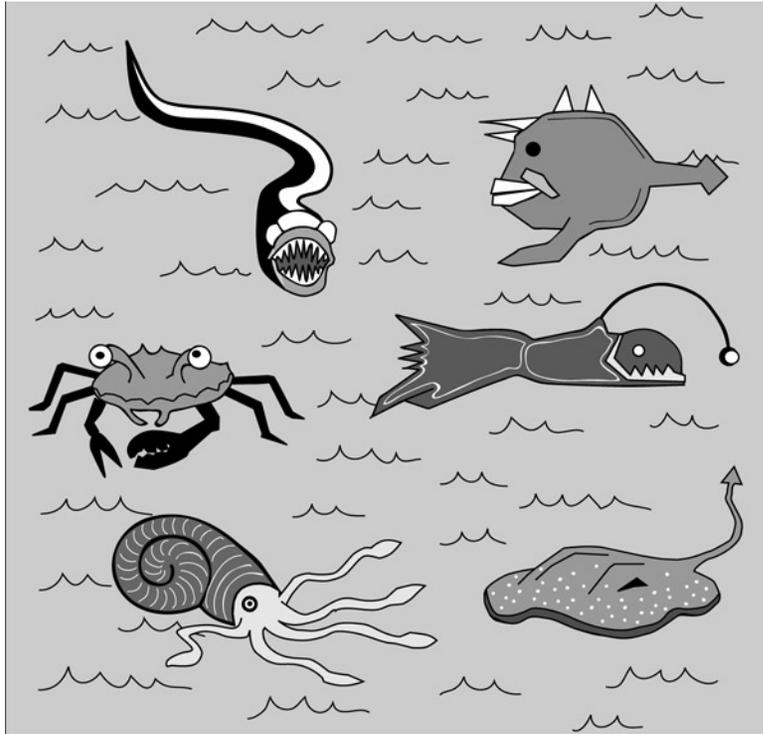
Molly Starts Out: The Trench

My last cycle began deep near the ocean floor. I have no idea how I arrived. That's the thing about living in a cycle. Just when you're finishing one story, another begins.

So as this one commenced, I was in liquid water, deep under the sea. I was more than 10 kilometers down, right near the bottom of a deep-sea **trench**. It was very dark and cold. It was so cold, my friends and I stayed close, and we didn't have much energy.

There were billions of other water molecules stacked on top of us. Ten kilometers of ocean water was pressing down from above, so there was a lot of pressure.



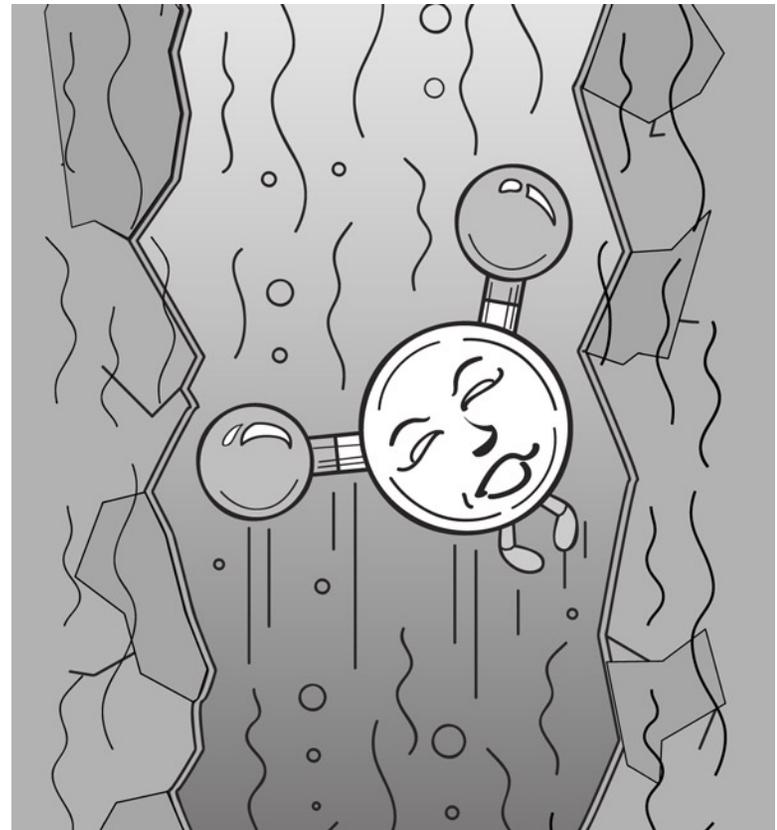


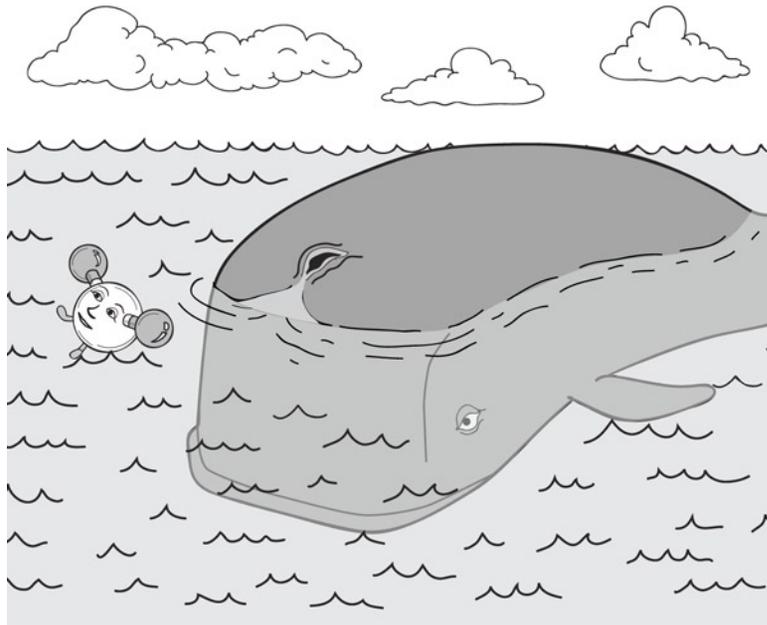
It's a different world in a deep ocean trench. Let me tell you, there are some strange animals swimming and crawling there. Since no light can get through all that water, it's dark all the time. Animals are dark-colored or dull. Some animals had no eyes. Some had even **adapted** to make their own light.

I thought that was pretty smart. They don't use the light to see much. Tiny creatures get curious and swim closer. Then they get eaten! Luckily, I didn't get swallowed. At least, not then.

I was just getting used to this environment when I accidentally floated over an ocean **vent**. Hot gas from deep inside the Earth was coming out of it.

The heat energized me. I wanted to move around more, so I took up more space. I began to rise up from the ocean bottom. As I rose, the pressure lessened. The closer I got to the sea's surface, the brighter it got and the warmer I was.





Molly Gets Sucked In: The Ocean's Surface

I was not the only water molecule in that ocean. There are about 1.5 sextillion water molecules in a drop of water. You could say there were a whole lot of us.

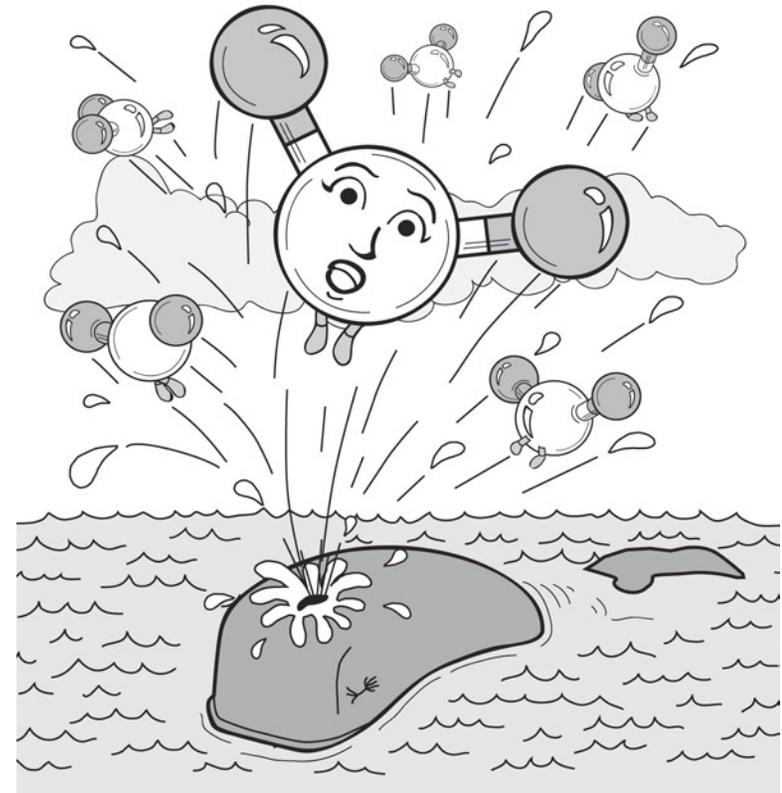
My molecule friends and I were floating along. We were near the tropics, nice and warm. Life was good.

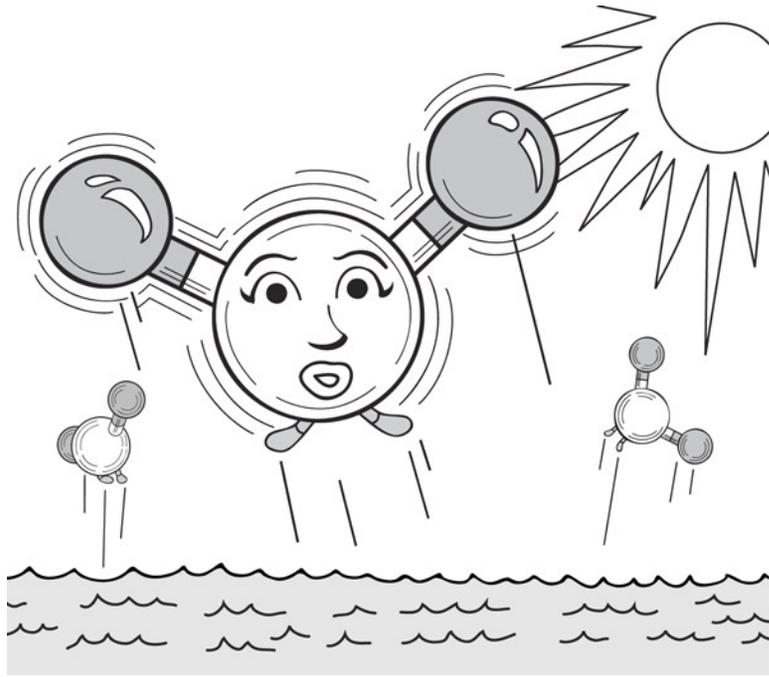
Just when things were going well, it got dark. A humpback whale had sucked me in! Who wants to spend the rest of their life in a whale's blowhole?

Just as I was giving up, the whale gave me up! It made a big honk and blew me out of the blowhole on top of its head.

I flew into the air and landed on the surface of the sea.

It wasn't so bad! There was no water pressure on the surface. It was sunny and waaaarrrm. Before long, the Sun's heat got me even more energized.





Molly on the Rise: Water Vapor

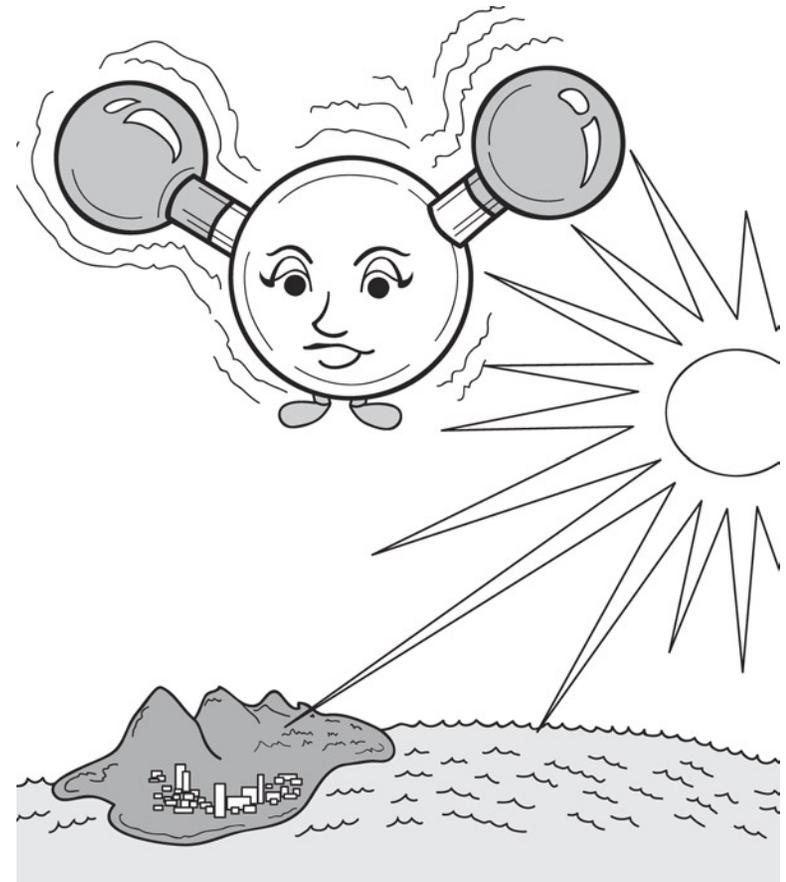
I was starting to have a lot of energy. I was starting to zoom and bounce all over the surface.

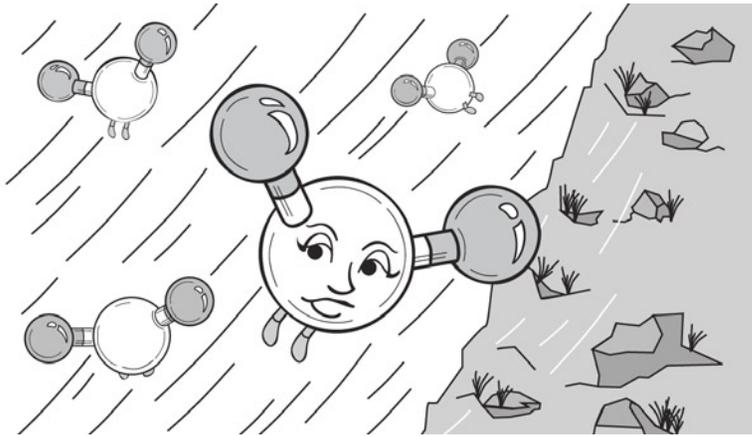
One sunny day, as the Sun was shining right on me, I felt so much energy that I jumped out of the water. I **evaporated**. I wasn't a liquid anymore. I was **water vapor**. That's what water is when it's a gas.

I felt lonely. I had no other water molecules pushing up against me. I could see my evaporated friends, but they were far away.

Just as in my other phases, I got used to being a gas. I began to look at my new environment. It was nice to float over the ocean and to feel as light as air.

I rose high in the sky and the view got better! I began to enjoy being a gas molecule. Floating on the warm sea breezes is a very nice life. I could see some of my friends in a liquid form below!





However, it did not last forever. Once again, my life changed. One day, I was resting in the warm breeze. I was hardly paying attention. Then I saw we were getting near land. It was coming up fast, all steep and rocky.

We went right up the side of the mountain, getting cooler and higher. I lost all my energy. I was no longer feeling bouncy.

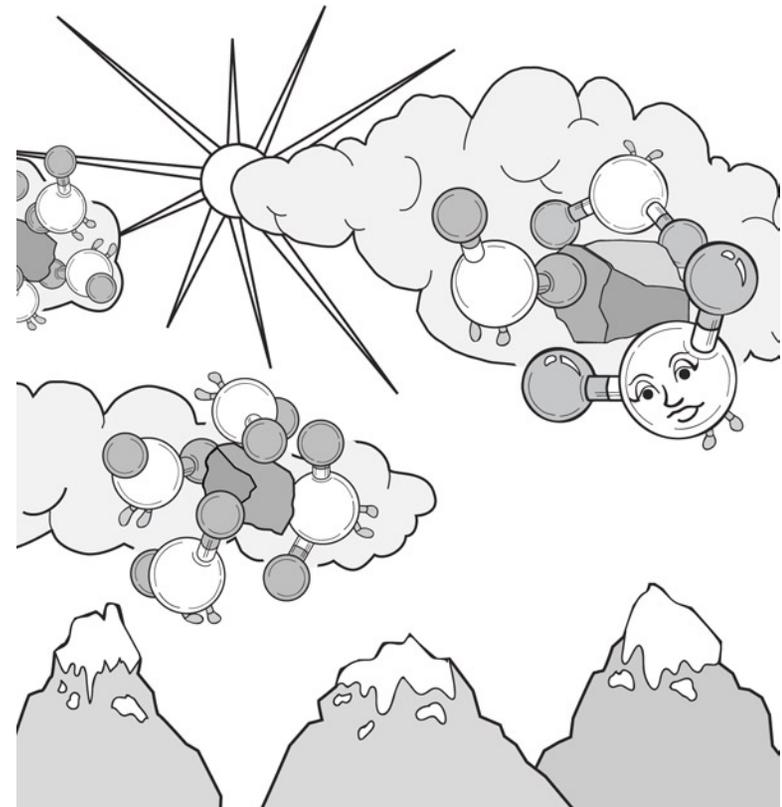
My friends and I got slower and cooler. We started to huddle together. We were no longer a gas. We were liquid again. We had **condensed** onto a speck of dust floating in the air. Now we were a water droplet.

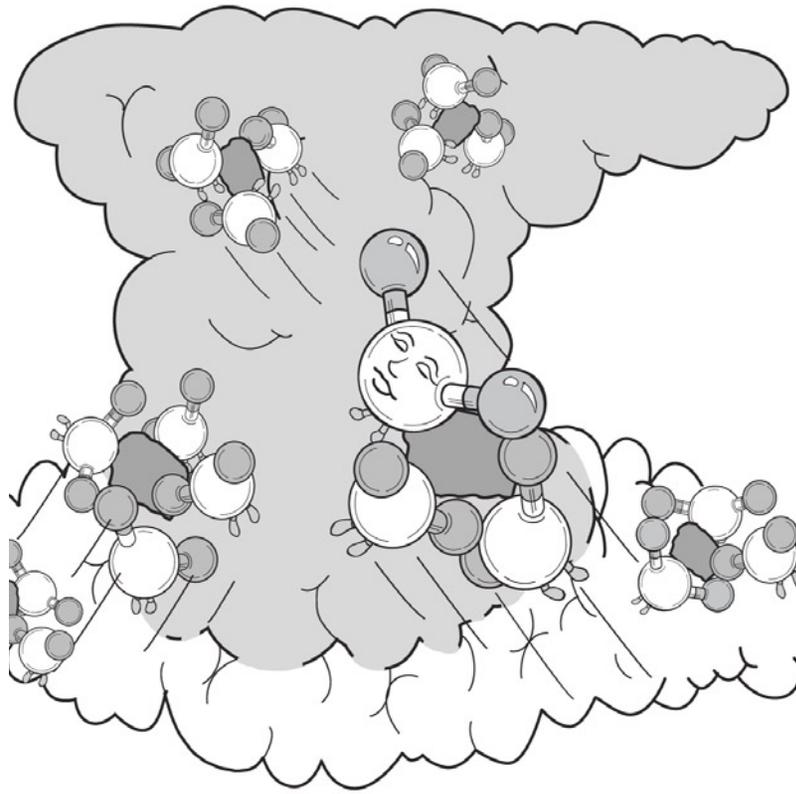
Every water vapor molecule around was condensing. All the water droplets began to bunch together.

Molly Condensed: Life in a Cloud

We had become a giant fluffy white cloud. Some children looking at us said we looked like a big sheep.

It wasn't too bad to be a cloud. I liked being close to my friends, and we liked being carried by the wind. I just didn't have enough energy to do much more than sit on our speck of dust. A pleasant breeze blew us along.



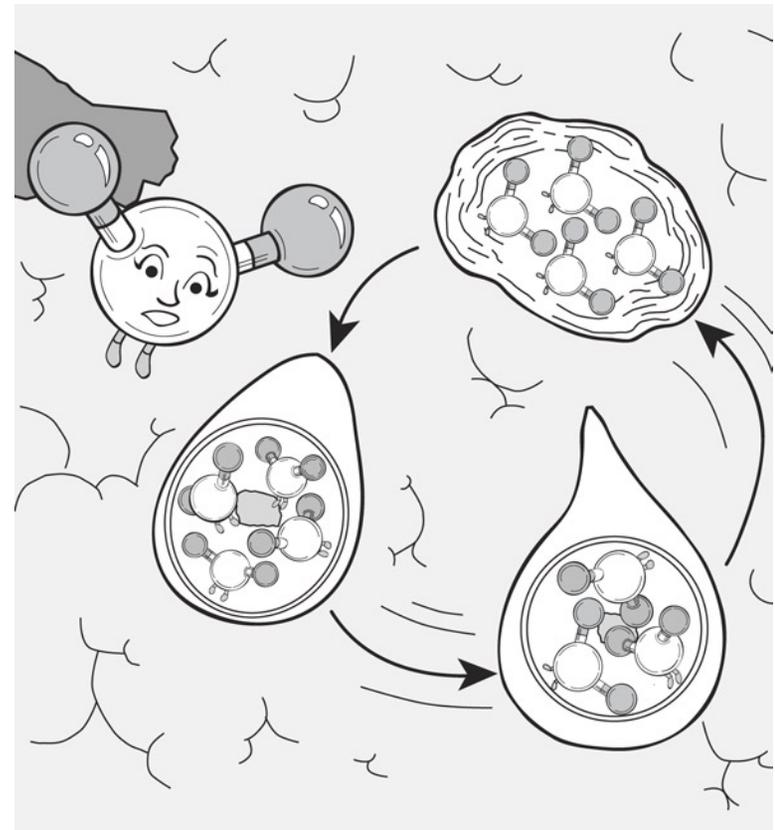


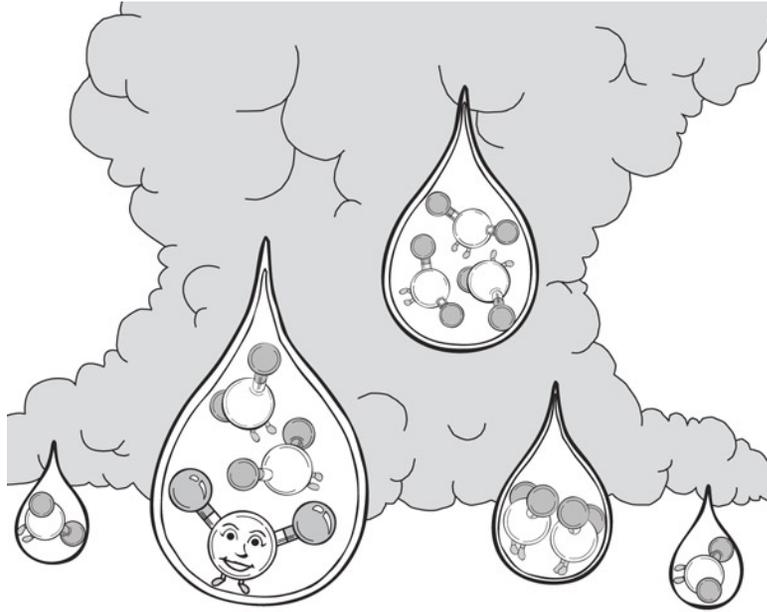
There was another change coming. We were all in our cloud, enjoying the warm air mass that blew us along. All of a sudden, we hit a colder air mass that came down from the north.

This mass was much colder than we were. It went under us and shot us up into the atmosphere. As we went higher, more and more droplets joined our cloud as we grew into a big dark **thunderhead**. The air got so cold, that we hugged each other tightly.

Molly Precipitates: Raining and Pouring

Some of my friends got caught in a mini-cycle. They started to fall as rain, and then the wind blew them up high, where they froze. They fell again and were coated by more raindrops. Then the wind blew them back up again. This happened over and over. They grew so many coats of ice that they got heavy, and fell to the ground as **hail**.





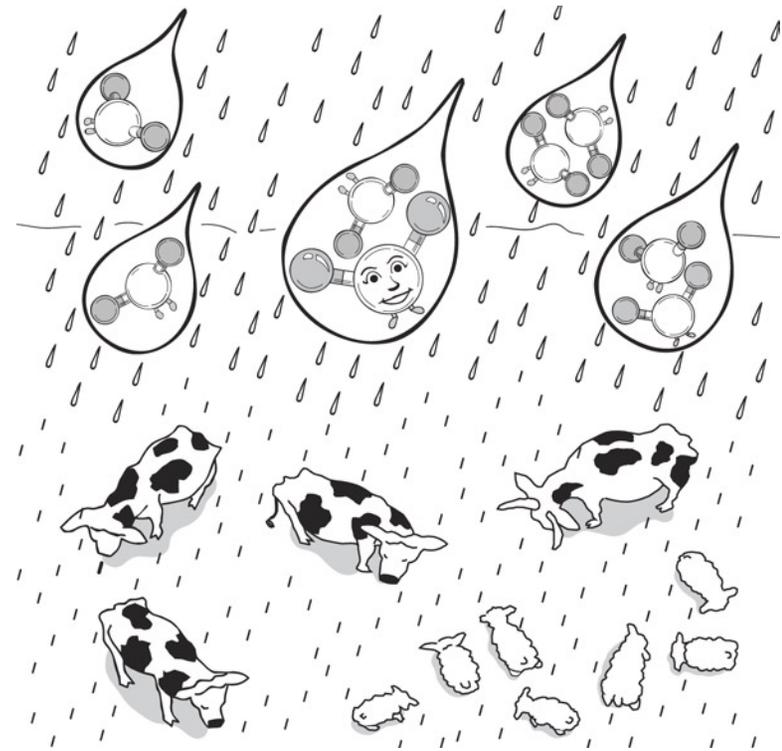
I stayed near the bottom of the thunderhead with my friends until we began to bump into each other. We turned into a large water drop.

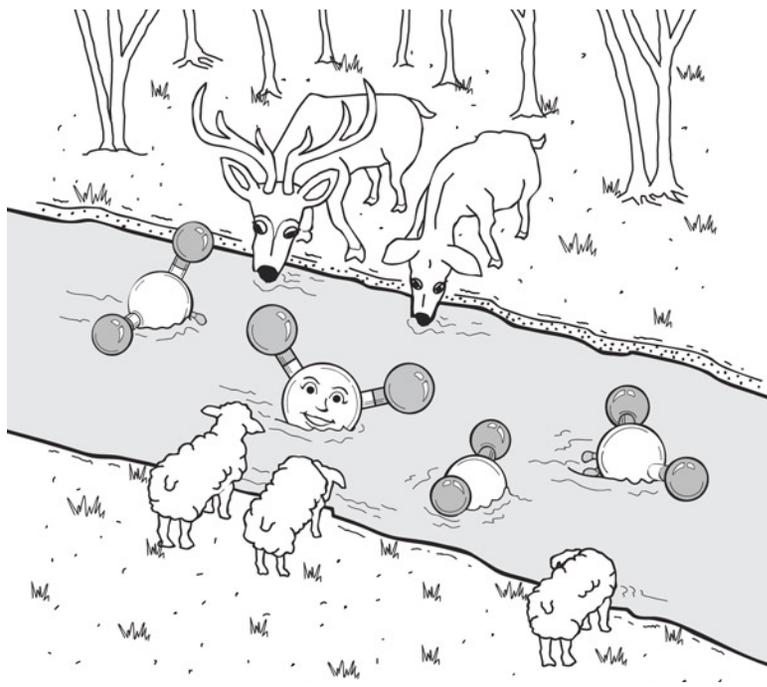
We were too heavy to stay in the air. We became **precipitation**, falling to Earth in a rainstorm. We fell faster and faster as gravity pulled us closer to the ground.

All of a sudden, splat! We crashed in the middle of a pasture on a hillside. Sheep and cows were grazing there. Some of my friends soaked into the ground. “See you later!” they shouted. “We’re going to the **aquifer**! Soon we will be **groundwater**!”

My friends and I stayed on the surface of the ground. We flowed as **runoff** down the hillside, in between the sheep and cows. We tumbled over the ground, picking up dirt, small pebbles, and even some rocks. We eroded a few deep **gullies** along the way.

We turned into a small **rivulet**. That was one of my fondest memories of this last cycle. Alas, just like the other phases, it came to an end. Our little stream joined other streams. We became a slow, meandering river.





Molly Runs: The River

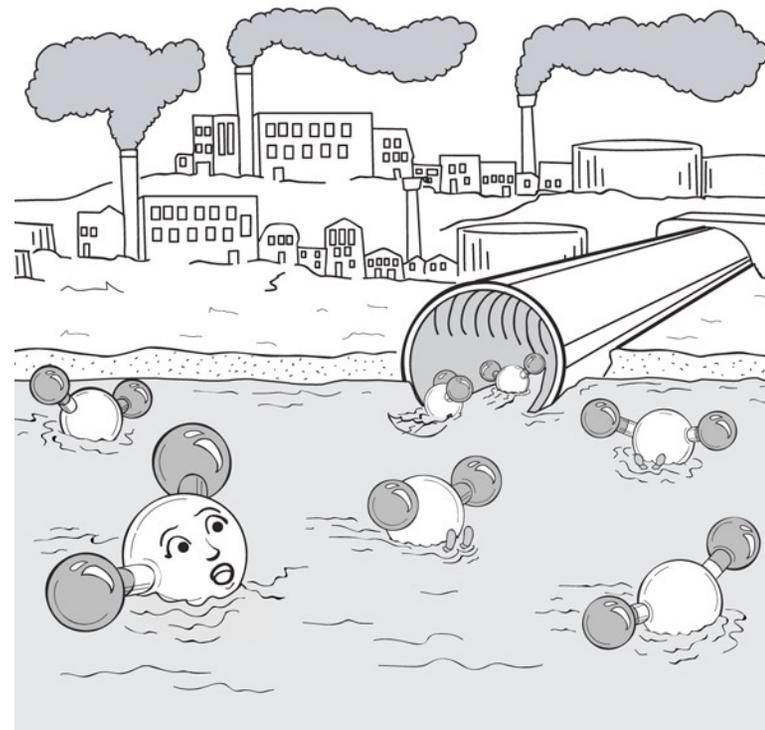
Many streams joined up, and made this river's **watershed**. Each stream brought **sediment** they had picked up as they flowed over the land.

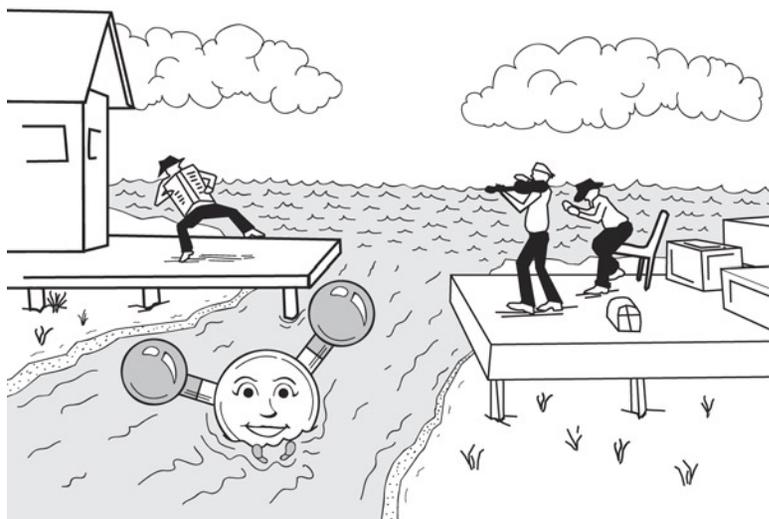
Every day, millions of water molecules evaporated from the river. Of course, more evaporated on sunny days. Animals came to the river and just slurped some of us up.

That was just a detour, though. Most of that water ended up back in the river after it went through the animal.

The worst thing was the factory pipes on the river. The pipes would suck us into the factories. They would use us to cool their machines. Then they would spit us out again. Evaporation took the others.

I continued to flow downstream. One day, salt molecules began joining us. At first, there weren't very many, but soon they were crowding around us. The river was meeting the sea. I'd left the sea more than a year ago, and now I was coming back.





Molly Completes Her Cycle: Back to the Sea

I was at the mouth of the river as it entered the ocean. Now I was back in my own backyard.

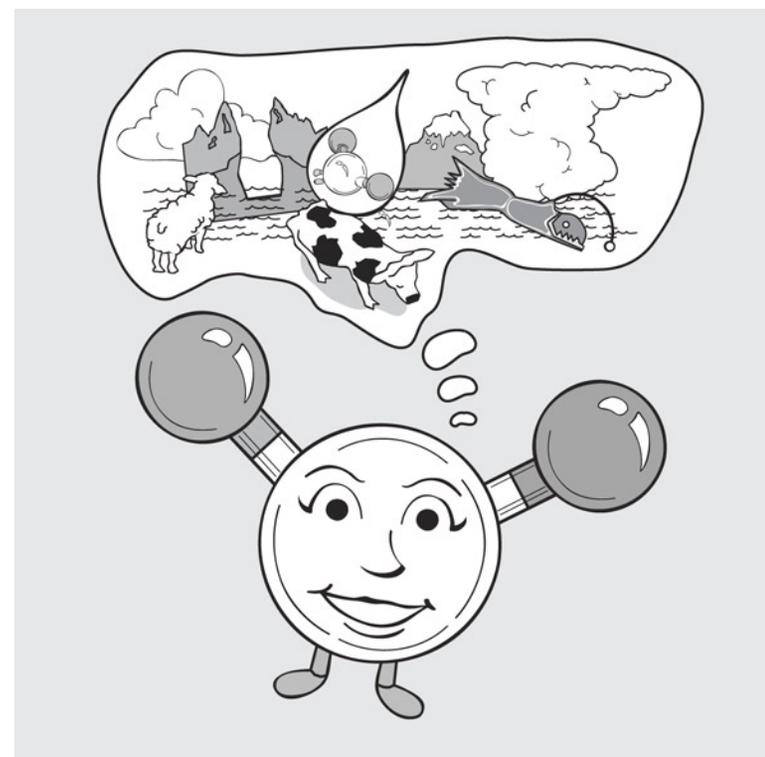
All the water molecules began to slow down. We began to drop the sediment we were carrying. We added it to the river **delta** that had been formed by thousands of years of sediment deposit. Soon, I flowed into the ocean and moved farther from the shore. It was good to be back in this familiar, pleasant, and clean environment.

I caught an ocean current headed west and relaxed. I began to dream about my next adventure. That's one thing about being part of a cycle—life is always bringing new adventures.

I dreamed about the story I would tell my friends if I ever saw them again. And if I didn't, there would always be new water molecules to meet. After all, there are quite a few out there.

As the cool water began to draw me back down into an ocean trench, I thought about this last cycle. It was one-of-a-kind. At the same time, every cycle has phases like the others.

Now I could only wonder where the next adventure would take me.



Glossary

adapted	adjusted to different conditions (p. 7)
aquifer	spaces in the ground that store water (p. 17)
condensed	went from gas to liquid (p. 13)
delta	land at the mouth of a river created by sediment (p. 21)
evaporated	went from liquid to gas (p. 11)
groundwater	water running along and under the ground (p. 17)
gullies	a hollow worn in the ground by running water (p. 18)
hail	a frozen kind of precipitation (p. 16)
molecule	the smallest amount of an element or compound (p. 4)
precipitation	water that condenses in clouds and falls to the ground (p. 17)
rivulet	a stream (p. 18)
runoff	rainwater that flows on the land (p. 18)

sediment	dirt and pebbles carried by running water (p. 19)
thunderhead	large, dark rain cloud (p. 15)
trench	a deep ditch (p. 6)
vent	a hole or opening; in this case, in Earth's surface (p. 8)
watershed	all the land around a river; any water that falls here, flows into the river (p. 19)
water vapor	the gaseous state of water (p. 11)