mystery science

Grades K-5
Mini-Lesson: “Why is the ocean salty?”

VIDEO TRANSCRIPT

VIDEO 1

Hi, it's Doug! I didn't grow up anywhere near an ocean, but now, as an adult, I live not far from one. That's the Pacific Ocean behind me, and I can tell you, if you've never been swimming in the ocean and accidentally gotten a mouthful of ocean water, it's so salty-tasting.

Now, it's never a great idea to drink any kind of water directly from an ocean or lake. There can be germs in it, but you can try ocean water for yourself at home by taking a few teaspoons of salt and dissolving it in a glass of water. Give it a try. Blech!

Someone named Ally has a question about the ocean. Let's give her a call now.

[Video Call]
- Hi, Doug!
- Hi, Ally!
- I have a question for you. Why is the ocean salty?
- That's a great question.

One thing that's really weird is why the oceans are salty, but other waters like lakes and rivers aren't salty at all. You might know that we call the water in the lakes and rivers freshwater. Not

that you can drink it directly—you still want to boil it or clean it before drinking—but water from lakes and rivers doesn't taste salty the way the ocean does.

In fact, when scientists are studying any of the water that they find on Earth, that's one of the first things they do. They figure out, "Is it saltwater, like from the ocean? Or is it freshwater, like from lakes and rivers?" So, why is the water that's in the ocean different from the water that's in lakes and rivers? Why is the ocean water salty? Did a bunch of salt somehow get dumped into the ocean or something?

Do you have any ideas? Why do you think the ocean is salty, but lakes and rivers aren't?

VIDEO 2

So why does the water in the ocean have salt in it? I have to tell you, this is a tough mystery to solve. For a long time, very few people had any ideas at all. But today, we do have some ideas based on clues that people like scientists have noticed and discovered. Scientists have developed special tools and equipment that they can use to measure very small amounts of things, And they discovered something really surprising. Even though the water in lakes and rivers is what we consider fresh water, when they tested the water and checked very carefully, they found out that this water actually does have a teeny tiny amount of salt. Not enough to where you'd be able to notice it if you tasted it. But the water in lakes and rivers is a little bit salty. Just a little bit. In fact, every place they look, it doesn't matter if it's the tiniest pond or stream, there's still a little tiny bit of salt in the water. There's one exception, and that's this, rainwater. When it rains, that water, the water falling from the sky, has no salt in it at all. Even rain that falls on the ocean, there's zero salt in the raindrops. So rainwater is one hundred percent completely fresh water. But here's the thing, Scientists discovered that once rainwater

hits the ground, like when it starts to form puddles or when it trickles down into streams and rivers, that's when it starts to become a little bit salty. So then there must be something about the ground itself which makes the water in lakes and rivers become just a tiny bit salty, and there is. Geologists are scientists who study the rocks and soil that the ground is made of. They've been able to figure out that most rocks and soil contain tiny amounts of salt. When rainwater lands on the ground, it absorbs some of that salt. As that rainwater trickles into lakes and rivers, it carries the salt with it. This is why water in lakes and rivers has a little tiny amount of salt, but rain itself when it's falling has no salt since it hasn't come in contact with the ground yet. But then why does the water in the ocean have so much more salt than the water in lakes and rivers? That's the big question, a question that scientists who study the ocean still aren't completely sure they know the exact reason. But if you look at a map and you trace your finger along the many rivers you see on the map, you can see that most rivers and even some lakes connect to the ocean. And since rivers and lakes are located on the continents or land, which is higher up than the ocean, the water in the rivers and lakes usually flows down into the ocean. Even though river and lake water only carries a tiny amount of salt, if that water has been flowing for years and years down into the ocean, all that salt that it does carry just keeps getting added to the ocean over and over where it probably never leaves. We think this might be one big reason why the ocean is so much more salty than all the other water on Earth. That's all for this week's question. Thanks, Ali, for asking it.