mystery science

Grades K-5
Mini-Lesson: “Is Earth the only planet with life?”

VIDEO TRANSCRIPT

VIDEO 1

Hi, it's Doug! The planet Mars is sometimes known as “The Red Planet,” and with good reason. When scientists sent robotic landers to Mars, they found lots of red-colored rocks and even red dirt similar to the kinds of red rocks and red dirt you might find here, on Earth. They even found evidence that Mars once had a lot of water, but we've yet to find any sign of life on Mars.

Someone named Sanskriti has a question about life on other planets. Let's give her a call now.

[Video Call]
- Hi, Doug!
- Hi, Sanskriti!
- I have a question for you. Is Earth the only planet with life?
- That's a great question.

You might know that our solar system has eight planets orbiting the Sun: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. But our planet, the Earth, is special. It's the only planet that has life. Why is that? Why is Earth the only planet with life in our solar system?

VIDEO 2

You might know that some planets are really hot. Mercury and Venus, the planets closest to the Sun, reach temperatures over 800 degrees Fahrenheit. So, it's no wonder there aren't living things on these planets.

The Sun is the source of most heat in the solar system, so the farther you get from the Sun, the star at the center of our solar system, the cooler it gets. The farthest planets are really cold. The temperatures on Uranus and Neptune are about 300 degrees Fahrenheit below freezing. On the dwarf planet Pluto, it gets even colder, about minus 380 degrees Fahrenheit.

Living things can't survive on planets with extreme temperatures that are either way too hot or way too cold, but somewhere in between there's a zone—a place in the solar system where the temperature is just right for life. A place that's not too hot and not too cold.

Scientists have a special name for this zone around the Sun. They call it the *Goldilocks Zone*, as in Goldilocks and the Three Bears. Have you heard the story? Goldilocks goes into the bear's house and tries different things that belong to the bears, like the three bowls of porridge. One is too hot, one is too cold, and one is just right.

Earth is in the “just right” part of the solar system. Earth is the only planet in the solar system with liquid water on its surface. In fact, that's where it gets the nickname “The Blue Planet.” Earth is not so hot that all of the water boils into vapor, and it's also not so cold that all of the water freezes into ice. It's “just right” for life.

So, that explains how Earth is unique in our solar system. But it's not necessarily unique in the universe. It's not just our Sun that has a Goldilocks Zone. The Sun is a star, like the other stars in the sky, and every star has a Goldilocks Zone around it. When you look up at the night sky, there are millions of stars, meaning millions of places where life might exist.

Many scientists, like Neil deGrasse Tyson, strongly believe that Earth probably isn't the only place in the universe where life exists. We just haven't found life on other planets yet, but scientists are hunting for it. As of now, scientists have found over 50 planets orbiting around other stars in the stars' Goldilocks Zones.

Who knows? Maybe life exists on one of these planets waiting to be discovered by a future scientist, like you.

So, in summary, so far scientists have only found life on one planet in our solar system, the Earth. Earth is in the Goldilocks Zone of our Sun. That's where it's not too hot or too cold. Scientists are now searching for Goldilocks Zones around other stars to try to find life elsewhere in the universe.

That's all for this week's question. Thanks, Sanskriti, for asking it!