

74 - Habitable Zone

Habitable Zones refer to regions in space in which planets have 'Earth-like' conditions, that can potentially support life as we know it. But what makes a planet potentially habitable? How many other habitable planets have we discovered? And could there possibly be life elsewhere in the universe?

Research gathered from the Kepler space telescope's data leads us to believe there could be as many as 300 million potentially habitable planets in the Milky Way alone. Because all these space destinations are so far away, NASA launches telescopes into space that send pictures back to us here on Earth. And they are AWESOME!

Named after 17th century German astronomer Johannes Kepler, well known for publishing his laws for planetary motion -- the objective of the Kepler Mission, was to explore our Milky Way galaxy and hopefully discover some other planets similar to Earth!

We launched the Kepler telescope in 2009. By the time we retired it in 2018 (when it finally ran out of fuel), Kepler revealed 2,600 planets from outside our solar system, many of which may be able to support life!

While the other planets in our own solar system -- gas giants like Jupiter & Saturn; ice giants like Uranus & Neptune and hot, super-Earths like Mercury & Venus are all clearly uninhabitable -- planets outside our solar system show promise. We became aware of terrestrial planets that have temperatures and gravity similar to Earth, as well as liquid water on their surface. Of course, there's no telling what kinds of *other* life could survive, or thrive, on planets with different terrains, atmospheres, or temperatures. Or, whether other human-like creatures have the technology capable of traveling to Earth.

In 2011, NASA's Kepler Mission confirmed it's first planet in the Habitable Zone: Kepler-22b. This planet is about 2.4 times the radius of Earth, contains a similar atmosphere, and has surface temperatures averaging 72-degrees Fahrenheit. There might even be oceans! However, before you get your beach gear -- keep in mind, it's difficult to confirm because Kepler-22b is 600 light-years away from Earth - in the constellation Cygnus. So, we won't be going there any time soon...

All the statistics related to recently discovered planets is conveniently detailed in NASA's: Exoplanet Catalog -- which you can find on NASA's website. It's like a travel brochure of planets to visit one day!

Things You Will Learn

1. What is the 'Goldilocks Zone'?
2. What makes a planet habitable?
3. What are some amazing similarities between Kepler-22b and Earth?

We'd like to make you aware of an amazing service called [Readeo](#) that has really impressed us with the way they use digital technology to create real-world connections with the littles in your life. [Readeo](#) provides a virtual story-time platform—called BookChat—where you can read award-winning books over video chat with loved ones, no matter how far apart you are. With over 500 books on the site and new ones added weekly (and from major publishers) there's a story for everyone. We're excited that [Readeo](#) is a supporting sponsor of Who Smarted? and we share their love of connecting with a child in a shared reading experience. We have a special offer for Who Smarted? fans. Please try Readeo out for yourself with a 30-day free trial by using the code 'Smart' on [Readeo.com](#).

Activities

1. People need water to make a planet habitable. On Earth, we have the water cycle, which provides rain for crops to grow and water for people to drink. Check out [this](#) fun experiment! Make sure an adult helps you with the hot water.
2. Being able to grow food is another important part of a habitable planet. You can read about a seed's lifecycle [here](#). Ask an adult if you can plant a few seeds in a pot and watch them grow!
3. Would you like to live in a place where it snows every day? How about all sunshine, all the time? Think about what kind of weather you like outside and draw a picture. What temperature does it need to be before it can snow? What temperature is best to go swimming?

Additional Resources

Want to spend some time in the NASA Exoplanet Catalog? You can explore all of the planets Kepler discovered [here](#). What would you name a habitable planet?

Kid News

Scientists have extracted DNA over a million years old from a Siberian Mammoth tooth. This DNA helps us understand how different breeds interacted with each other over thousands of years. DNA, which is like a blueprint to a living thing, breaks down over time. Scientists used DNA from elephants, which are a distant cousin to Mammoths to help fill in the gaps. You can read about these fuzzy giants [here](#).¹

¹ This activity guide is for the Who Smarted? podcast www.WhoSmarted.com