Solar Systems

Name: Date:

Space mission to a distant solar system

It's the year 2148 and a group of astronauts has embarked on a journey to a distant solar system. Listen to their first radio transmission that they send to the space agency.

Audio Content

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https://to-teach.ai/worksheet/4C8TilpW3B9xYA4BmMyn

Notes

Have you ever heard of the solar system that is being reported on? What do you find particularly exciting about the report?

The solar system

Read the following text about the solar system and answer the questions.

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Proxima Centauri System

The Proxima Centauri system is a captivating solar system located just 4.24 light-years away from Earth, making it the closest known star system to our own. This system is intriguing for its similarities to our solar system, as well as for its unique features that capture the interest of astronomers and students alike.

At the center of the Proxima Centauri system is the star known as Proxima Centauri. This star is a red dwarf, which means it is smaller and cooler than our Sun. Red dwarfs are the most common type of star in the Milky Way galaxy. Proxima Centauri is only about one-eighth the size and mass of the Sun and has a surface temperature much lower than that of our own star. Despite its smaller size, Proxima Centauri has a significant influence on its surrounding planets.

The Proxima Centauri system is known to have at least three planets: Proxima Centauri b, Proxima Centauri c, and a recently discovered candidate, Proxima Centauri d. Among these, Proxima Centauri b is the most intriguing. Located in the habitable zone, or the "Goldilocks zone," this planet is at just the right distance from its star to potentially have liquid water on its surface. Proxima Centauri b is roughly the same size as Earth, which makes it especially interesting to scientists searching for extraterrestrial life. It is about 1.17 times the mass of Earth, making it a close match in terms of size and possibly composition.

The entire Proxima Centauri system is much more compact than our solar system. For example, Proxima Centauri b orbits its star at a distance much closer than Mercury orbits the Sun. This compact arrangement is quite different from our solar system, where the planets have more spread-out orbits. Despite this, the discovery of Proxima Centauri b in the habitable zone draws strong parallels to Earth and raises questions about the possibility of life elsewhere in the universe.

One of the most exciting aspects of the Proxima Centauri system is its potential to teach us about the variety and nature of planetary systems. It demonstrates that planets can exist in the habitable zone of their stars, even if those stars are different from our Sun. This expands our understanding of where life-supporting conditions might be found.

In summary, the Proxima Centauri system is a remarkable example of the diversity that exists in our galaxy. Its small yet significant star and the presence of a potentially Earth-like planet in the habitable zone make it a key point of interest. As we continue to study systems like Proxima Centauri, we move closer to answering the profound question of whether we are alone in the universe.

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Choose the correct answer for each question.

What type of star is Proxima Centauri?

○ Blue giant ○ Yellow dwarf ○ Red dwarf ○ White dwarf

Why is Proxima Centauri b particularly interesting to scientists?

○ It has an atmosphere similar to Jupiter ○ It has a massive ring system
○ It is located in the habitable zone where liquid water might exist
○ It is the largest planet in the Proxima Centauri system

How does the size of Proxima Centauri compare to our Sun?

○ It is about ten times the size and mass of the Sun
○ It is about half the size and mass of the Sun ○ It is about the same size and mass as the Sun
○ It is about one-eighth the size and mass of the Sun

Which planet in the Proxima Centauri system is located in the habitable zone?

○ Proxima Centauri e ○ Proxima Centauri d ○ Proxima Centauri b ○ Proxima Centauri c

What makes the Proxima Centauri system's arrangement different from our solar system?

○ There are no planets in the habitable zone ○ Its star is a yellow dwarf
○ The planets have more spread-out orbits ○ The planets have more compact orbits

Why is studying the Proxima Centauri system important for our understanding of planetary systems?

○ It confirms that all planets must be similar to Earth to support life
○ It demonstrates that only large stars can have habitable zones
○ It shows that planets can exist in the habitable zone of red dwarf stars
○ It proves that red dwarfs cannot have planets

What is the approximate distance from Earth to the Proxima Centauri system?

○ 4.24 light-years ○ 2.3 light-years ○ 10.5 light-years ○ 7.8 light-years

What is the significance of Proxima Centauri b being similar in size to Earth?

- ○ It means it has a similar atmosphere to Venus
- ○ It indicates that it has a ring system like Saturn
- ○ It suggests that it is a gas giant
- ○ It makes Proxima Centauri b a candidate for potential habitability

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Describe the characteristics of Proxima Centauri and how it differs from our Sun.

Explain why Proxima Centauri b is of particular interest to scientists searching for extraterrestrial life.

The crew continues their journey

Listen to another radio message from the astronaut crew on their mission in the distant solar system.

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