

# Stargazing

by ReadWorks



After the sun sets, take a look at the night sky. On a clear night, you'll be able to see stars scattered across the black expanse that we call our universe. If you're lucky, you might be able to spot some stars that look bigger than others—they shine brighter and attract our attention more than their smaller neighbors do. You might wonder: why are some stars brighter than others?

After much observation, scientists discovered the way stars appear to us depends on more than their actual size—it's also about how far they are from us. Therefore, the farther a star is from Earth, the smaller it will appear to us. The closer it is, the bigger it will look.

Try to think of the biggest star you've seen in the sky. An easy one, right? The sun! That's because the sun is closest to us compared to all other stars, located at just a short 150 million kilometers from Earth.

The next one? That's a tougher question. Many people answer Alpha Centauri, but some don't know that it's actually a cluster of three stars—Alpha Centauri A, Alpha Centauri B, and Proxima Centauri. Proxima Centauri is 4.24 light-years away and closest to our sun. A light-year is the distance that light travels in one year. We use this measurement because light is

the only thing in the universe that maintains a constant speed. However, even though Proxima Centauri is the closest star to the earth after the sun, you can only see it with a very powerful telescope. That doesn't make sense-didn't we just say that closer stars appear larger and more visible?

Well, Proxima Centauri is what we call a red dwarf. Red dwarf stars are very small, typically having less than half the mass of the sun. That means they generate less energy than the sun. Most stars burn hydrogen for fuel. Similar to the way a car uses gas for power, a star uses hydrogen for energy. Red dwarfs burn hydrogen very slowly, which means they generate little light compared to stars like the sun.

Proxima Centauri is the closest star after the sun, but that doesn't necessarily mean it's what we consider close in our minds. To completely understand how far away this star is, let's think about traveling 4.24 light-years away. NASA has built one of the fastest spacecrafts in existence, called New Horizons, which travels at about 60,000 kilometers per hour. Even at this speed, it would take the spacecraft 78,000 years to reach Proxima Centauri from Earth.

Sadly, the first few closest stars are not visible to the naked eye at night, which means we can't see them while we're stargazing from our homes or backyards. The closest star we can see at night is called Sirius, or the Dog Star. While Proxima Centauri is only 4.24 light-years away, Sirius is 8.6 light-years away. However, since Sirius is so large (almost twice the size of the sun), we can see it in the night sky.

So go outside and see what you can find up there!

# The Brightest Sky

by Aditi Sriram



Emine had grown up in New York City and thought she could handle anything. No street was too crowded, no skyline too bright, and no parade too loud. She owned the city, and she was in command. The city was a part of her.

Or so she thought. When Emine traveled to Cairo for a two-week vacation, she wasn't prepared for what happened the moment she stepped off the plane. The heat hit her like a slap on the face. The dust found her eyes and nose immediately, and clogged them. Taxi drivers at the airport clamored for her attention, shouting and barking at her and each other in Arabic, trying to convince her to come with them. "Best price," they insisted in thick accents, looking at her eagerly. "For you-best price."

But Emine was determined to adapt to the city's frenetic energy. On her first evening in Cairo, she took a stroll from her hotel to the banks of the Nile, and watched the boats bobbing lazily on the water. Away from the traffic, people strolled and laughed quietly; the palm trees whispered in the wind, and Emine felt calmer. She watched the sun set, a deep red orb that sank into the clouds and then disappeared behind distant minarets, casting the evening in meditative hues of pink and purple. Emine relished the sight; it was nearly impossible to witness such a sight in New York City.

After a week of sightseeing in and around Cairo, Emine felt like she had a handle on the city. She knew all the second-hand bookshops and the metro. She had sugary crepes for breakfast. She listened to the calls to prayer from the many mosques. She could count up to

ten in Arabic, which made bargaining and ordering food a little easier. And she could recognize the stray cats that lazed outside her hotel. It was time for something new, Emine thought. A tour operator down the street had approached her a few times, advertising all kinds of trips on the Nile, to the Pyramids, and into the Black and White Deserts. The last adventure had caught her eye ever since she saw the pictures in the brochure, and Emine decided she would do it before her trip was up.

The following week, Emine joined two South Korean tourists and a friendly Bedouin guide, and together they drove 250 kilometers into the deserts. The Black Desert contained black volcanic rocks, whereas the White Desert contained white chalk rocks. The setting sun set the sky on fire, which she was used to, but what came next startled her completely: stars! Stars everywhere, and not at all like the few stars she could see in the New York City sky! These stars twinkled and nearly danced above her. Every few minutes, a shooting star whizzed by.

Her guide explained they were deep enough in the desert that no manmade light could interfere with the natural light in the sky. Compared to New York City's skyline, there was absolutely no electricity around her for miles. As a result, it looked like millions of people were taking pictures from the sky—each star a camera flash. Some stars shone more steadily than others, and the guide told her those were planets. He took out a high-powered telescope, through which Emine could see Saturn and its rings. She was amazed at how rapidly it moved from the field of view in the eyepiece of the telescope, because it was orbiting the sun so quickly. Emine fell asleep counting not sheep, not stars, but *shooting* stars. She had easily seen ten that night—more than she had ever seen before in her life.

In the morning, Emine was up early to watch the sun rise. The red ball was bigger than she had ever imagined, and Emine understood that, compared to the stars she had seen the night before, it was so much closer to planet Earth. Even as the sun rose higher in the sky, she could make out other stars twinkling faintly in the fresh morning sky and knew she would remember that sunrise forever.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**Use the article "Stargazing" to answer questions 1 to 2 .**

1. Of all the stars in the sky, the one that looks the biggest from Earth is the sun. Why does the sun appear to be bigger than other stars?

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2. Explain how the distance between a star and Earth affects how big the star looks from Earth. Support your answer with information from the article.

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**Use the article "The Brightest Sky" to answer questions 3 to 7 .**

3. Emine travels to Cairo on vacation. While there, where does she drive with two South Korean tourists and a Bedouin guide?

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**4.** Read these sentences from "The Brightest Sky" about Emine waking up in the desert.

"In the morning, Emine was up early to watch the sun rise. The red ball was bigger than she had ever imagined, and Emine understood that, compared to the stars she had seen the night before, it was so much closer to planet Earth."

Why is Emine up early?

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**5.** What is the size of the "red ball"?

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**6.** What is the "red ball" compared to?

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7. What is much closer to Earth than the stars Emine saw the night before?

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**Use the articles "The Brightest Sky" and "Stargazing" to answer question 8.**

8. Think back to what you learned from "Stargazing" about the size of the sun and its distance from Earth. Then reread the sentences above from "The Brightest Sky." Pay special attention to how the sentences describe the "red ball" that Emine sees. What might the "red ball" be? Support your answer with evidence from both "Stargazing" and "The Brightest Sky."

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