

Mystery Science: Unit Starter - Star Trails

MYSTERY science

Order

Ask Anything

Michelle ▾

Check out this picture of the night sky.

DISCUSS: What do you notice? How would you describe the stars?



Jan 23-10:18 AM

Go online to access your digital course.

- VIDEO
- eTEXT
- INTERACTIVITY
- VIRTUAL LAB
- GAME
- ASSESSMENT

The Essential Question What is Earth's place in space?

Show What You Know

Earth is among many planets in our solar system. There are four planets in the inner solar system and four planets in the outer solar system. What makes Earth an inner solar system planet?

Possible answer: Earth has a rocky surface and is closer to the sun than most other planets.

Topic 6 Solar System 231

Jan 23-7:52 AM

Lesson 1 Video

Brightness of the Sun and Other Stars



Jan 23-7:54 AM

Lesson 1

Brightness of the Sun and Other Stars

I can...

Recognize that many stars are as big and bright as the sun. Explain how the apparent brightness of stars is related to their distances from Earth.

5-ESS1-1

Literacy Skill
Text Features

Vocabulary
star

Academic Vocabulary
apparent

VIDEO

Watch a video about the sun and other stars.

LOCAL-TO-GLOBAL Connection

The sun, the only star in our solar system, provides energy for life on Earth. Scientists know a lot about the sun. Over time, they have discovered the existence of a vast number of stars throughout outer space. Our galaxy, the Milky Way, is one of more than 1 trillion galaxies in the observable universe. The Milky Way Galaxy has about 100 billion stars in it. Our sun is one of those stars. The sun is very large when compared to Earth. The sun has a volume that is about one million times the volume of Earth.

When was the last time you chewed a piece of gum from a gumball machine? Think of the sun as a gumball machine. It would take more than one million Earth gumballs to fill the sun gumball machine!

Compare and Contrast What are some differences between the sun and the stars you see in the night sky?

Sample answer: The sun is closer to Earth than all other stars in the night sky; the sun appears larger and brighter than the other stars.

Sun in our solar system supports planets that revolve around it while stars aren't in our SS but are in our galaxy and not sure about supporting other planets

236
Topic 6 Solar System

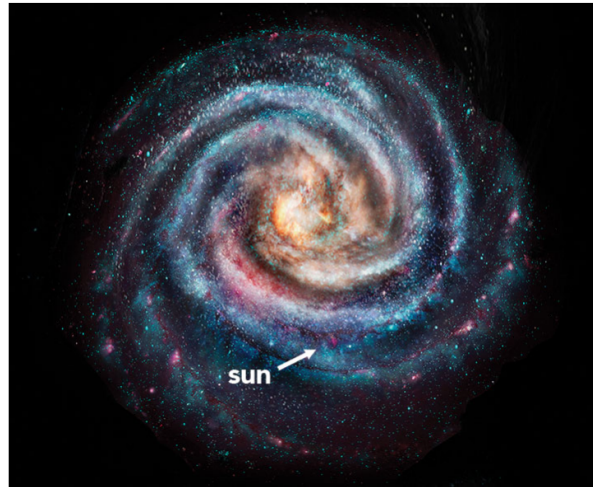
Jan 23-7:58 AM

Optional

Quest Findings: Keeping the Planets in Order

A galaxy is a huge collection of gas, dust, and stars. Our solar system is part of the Milky Way Galaxy.

This illustration of the Milky Way Galaxy shows the location of the sun and gives us an idea of the galaxy's immense size.



Jan 23-10:20 AM

Investigate Lab

How are distance and brightness related?

Scientists compare the brightness of stars. How can you investigate how light and distance are related?

Procedure

- ☐ 1. How does the distance from a light source affect the brightness of the light? Make a prediction.
I think the light will be brighter when I am closer.
- ☐ 2. Make a plan to use the materials to test your prediction. Show your plan to your teacher before you begin. Record your observations.
- ☐ 3. Rank the brightness of the light from 1 to 4, with 1 being the brightest and 4 being the least bright.

Distance from source of light	Diameter of light (cm)	Brightness rank
150cm	11cm	4
100cm	8cm	3
50cm	6cm	2
15cm	3cm	1

Analyze and Interpret Data

4. **Use Evidence** Explain how distance impacts the brightness of stars. Support your explanation with evidence from this lab.
Sample answer: The closer a star is to Earth, the larger and brighter it appears. The light from the flashlight got dimmer as it moved away from the paper.

HANDS-ON LAB

5-ESS1-1, SEP 7

Materials

- flashlight
- construction paper
- metric ruler

⚠️

Avoid shining light directly into someone's eyes.

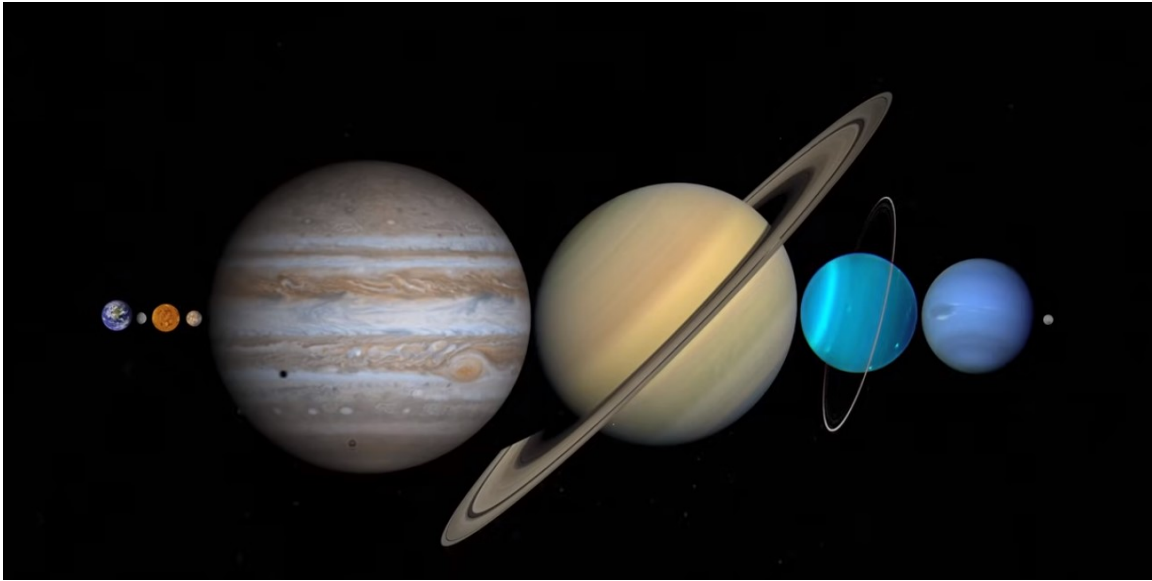
Science Practice

Scientists use evidence to support a scientific argument.

Lesson 1: Brightness of the Sun and Other Stars 237

Jan 24-7:41 AM

<https://www.youtube.com/watch?v=gIbfYsQfNWs&authuser=0>



Apr 29-9:00 AM

make a plan on a separate paper remember

- sequential
- brief
- specific

Jan 28-12:06 PM

Earth's Sun


pg. 238

Earth's sun is a star that is in the center of our solar system. A **star** is a huge ball of very hot matter that gives off energy. Stars shine because processes in the stars produce huge amounts of energy. The temperature of the center of our sun is about 15,000,000°C (27,000,000°F).

Earth's sun is the largest object in our solar system, but it is not the largest star in the universe. It is a medium-sized star when compared to the billions of other stars in our galaxy. Earth's sun makes up more than 99 percent of the mass of our solar system.

Without the sun, Earth would be a drastically different place. Life on Earth could not exist without the sun's energy. And the planet would be very, very cold.

Identify List two characteristics of the sun.

 Notebook

Apr 7-1:04 PM

Structure of the Sun

pg. 239

In addition to being much larger and hotter, the sun is different from a planet in another way. The main layers of the sun are the core, the radiative zone, and the convective zone. The core is where the sun's energy is generated. The radiative and convective zones carry the energy to the sun's surface.

The atmosphere of the sun has three layers: the photosphere, chromosphere, and corona. The photosphere is what we see when we look at the sun. The corona can be seen only during a total solar eclipse.

Make Meaning This photo shows a solar flare on the sun. Solar flares occur when energy heats the sun so much that it causes particles to explode into outer space. Write a short story about what happens when a solar flare explodes. Be sure to include the layers of the sun's atmosphere that the solar flare goes through.

 Notebook

Apr 7-1:04 PM

Solar System Lesson 1*238 & 239 Earth's Sun, Structure of the Sun*

- Read this section in partners
 - After reading, answer the questions.
1. Earth's sun is the largest object in our solar system, but it is not the largest star in the universe. It is a medium-sized star when compared to the billions of other stars in our galaxy.
 2. How much mass does the sun occupy in our solar system?
More than 99% of the mass of our solar system
 3. Discuss: Read and discuss the Crosscutting Concepts & Toolbox on page 238.

Crosscutting Concepts > Toolbox**Energy and Matter**

Farming, or agriculture, is critical to maintaining life on Earth. Why does a farmer rely on our star, the sun, for growing crops and raising animals? Do farmers rely on any other star in outer space?

Jan 24-7:44 AM

4. Discuss: What would happen to life on Earth without the sun?
5. **Complete the Identify on page 238.

Identify List two characteristics of the sun.

Sample answers: hot temperature, average-sized star, huge compared to Earth

6. **Complete the Quest Connection on page 239.

Quest Connection

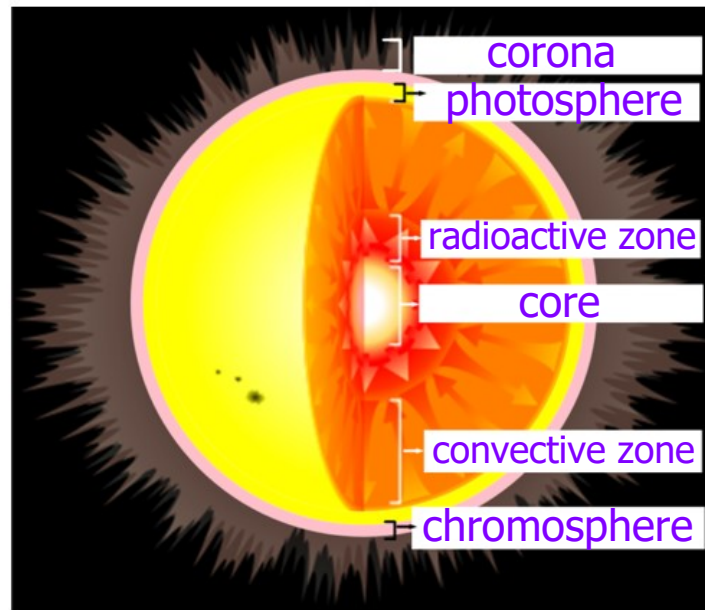
Why is it important to include the sun in your model of the solar system?

The sun is at the center of our solar system.

Jan 24-7:46 AM

7. Label the layers of the sun and the sun's atmosphere.

need to read
closely to
figure out
layers



Jan 24-7:48 AM

The Sun and Other Stars

There are many stars in the night sky. Some of these stars are larger than the sun, but they look much smaller because they are so far away.



Apr 7-1:07 PM

Here Comes the Sun: Crash Course Kids #5.1



Jan 25-7:32 AM

Optional: Seeing Stars: Crash Course Kids #20.1



Jan 25-7:37 AM

240 & 241 Distance of Stars, Brightness of Stars, Star Temperature, Size of Stars

- **Complete the Interactivity: The Sun and Other Stars as a class before reading

The Sun and Other Stars

There are many stars in the night sky. Some of these stars are larger than the sun, but they look much smaller because they are so far away.



Jan 24-8:02 AM

pg. 240

Distances of Stars

Have you ever been outdoors when the sun sets? At first, you do not see any stars. Then, as the sun disappears below the horizon, a few bright stars appear. The apparent size of stars is very small. **Apparent** means “the way something looks.” Even though stars in the sky appear to be small, they are actually many, many times larger than Earth. They appear small because they are so far from Earth. The distances of stars from Earth are enormous. To measure the distances, scientists use the light year. A light year is the distance light travels in one year—9,460,800,000,000 kilometers. The closest star in our galaxy is 4.2 light years away. Stars can be millions of light years away!

Brightness of Stars

The sun is much closer to Earth than other stars are. That is why the sun appears so much larger than any other stars. You may have noticed that some stars appear brighter than other stars. The brighter stars are not necessarily bigger or brighter. The apparent brightness of a star depends on how bright the star actually is and how far away it is. A brighter star can appear less bright in the sky than a star that is actually dimmer—if the dimmer star is closer to Earth.

Star Temperature

If you go near a campfire that is burning very brightly, it will feel very hot. If you go near a campfire that is dim, it will not feel as hot. The same is true for stars. Stars that are hotter will be brighter than stars that are not as hot. However, the relative brightness you see will depend on how far away the stars are from Earth.


Identify What are two factors that affect how bright a star appears in the night sky?


Apr 7-1:14 PM

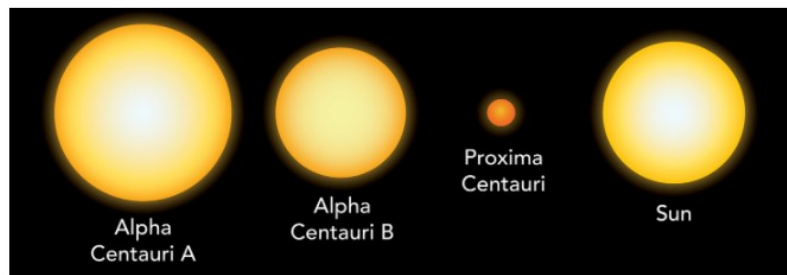
pg. 241

Size of Stars

Stars that you see in the night sky are not in our solar system. They are many light years away from us. The closest stars to our solar system are part of the Alpha Centauri star system. Three stars are part of this system—Alpha Centauri A, Alpha Centauri B, and Proxima Centauri. This diagram shows the relative sizes of the Alpha Centauri star system and the sun. Proxima Centauri is the star closest to our sun. Since the sun and the Alpha Centauri system are the closest stars to Earth, they appear brighter than other stars in the sky.

 **READING CHECK** **Text Features** What does the photo on the page tell you about Proxima Centauri and the sun?


 Notebook



You must demonstrate that the differences in apparent brightness of the sun compared to other stars is due to their relative distances from Earth. Describe a procedure you would use to support this concept.

Apr 7-1:15 PM

- Before reading, discuss #8
- Read this section as a class
- After reading, answer the questions.

8.  Why does a star that is much larger than Earth look very small in the night sky?

9. Define a light year.

A light year is the distance light travels in one year, or 9,460,800,000,000 kilometers

10. The closest star is 4.2 light years away.

11. How are the temperature and brightness of a star related?

A star that is hotter will appear brighter than other stars.

Jan 25-7:05 AM

12. **Complete the Identify on page 240.

Identify What are two factors that affect how bright a star appears in the night sky?

temperature and distance

13. **Discuss the Plan It! On page 241.

Plan It!

You must demonstrate that the differences in apparent brightness of the sun compared to other stars is due to their relative distances from Earth. Describe a procedure you would use to support this concept.

take two of the same flashlights and shine one close, like 2' away & a second farther, like 20' away and compare the brightness.

Jan 25-6:54 AM

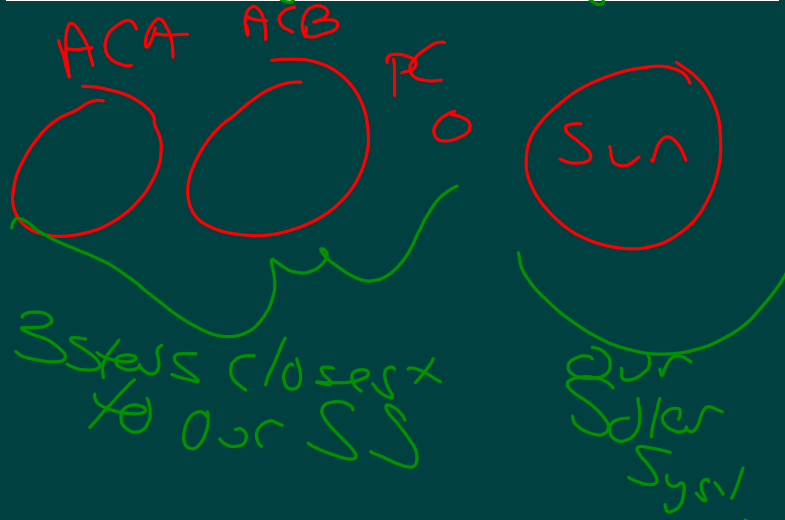
14. If the Alpha Centauri A star is larger than our sun, why does it appear as just a tiny dot in the sky?

It is much farther away than our sun, so it appears smaller.

15. How many stars are in our solar system? 1

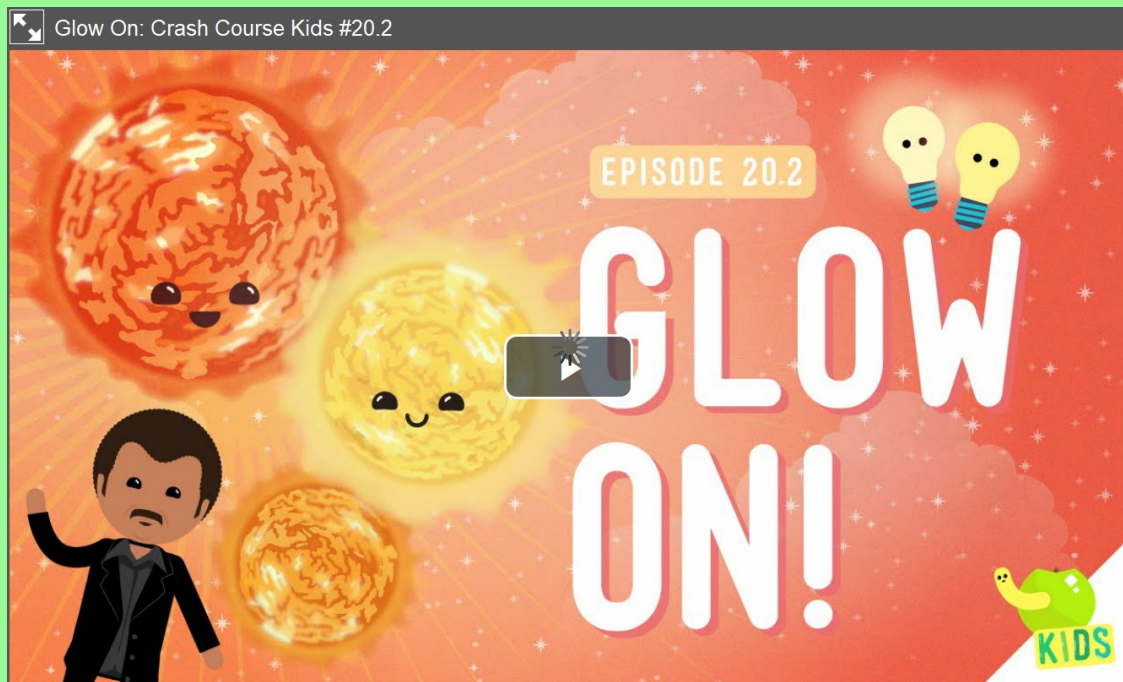
16. How would a star look to you at night if it was in the same solar system as Earth?

The star would look very large when seen from Earth.
we may never have night



Jan 25-6:56 AM

Glow On: Crash Course Kids #20.2



Jan 25-7:33 AM

Earth-Like Planets

pg. 242

In June, 2017, NASA, the United States space agency, announced that its Kepler telescope had discovered more than 200 new planets. These planets do not circle Earth's sun. Instead, they circle other stars in the universe.

Ten of these planets are about the size of Earth. They orbit their stars at a distance that is similar to Earth's distance from our sun. Scientists think these ten newly discovered planets might have temperatures that allow liquid water to exist on their surfaces. Scientists think that water is a key ingredient to support life.

Infer Why might scientists think these planets might have liquid water on their surfaces?

Notebook

The blue on this image of Earth is water. Scientists look for other planets that might also have water on their surface.



Apr 7-1:20 PM

242 *Earth-Like Planets*

- Read this section in partners
- After reading, answer the questions.

17. The Kepler telescope discovered more than 200 new planets. 10 of these planets are similar to Earth. Give two similarities these planets have to Earth.

They circle a star, they are similar in size, they orbit their stars at a distance that is similar to Earth's distance from our sun.

18. Why is the discovery of these planets important to scientists?

Scientists think that water is a key ingredient to support life so there may be life on these planets or these planets might be able to support life if brought there.

Jan 25-6:56 AM

19. **Complete the Infer on page 242.

Infer Why might scientists think these planets might have liquid water on their surfaces?

The planets are the same distance from their stars as Earth is from the sun. So the new planets might get about the same amount of energy from their stars.

20. **Complete the Lesson 1 Check on page 242.

☒ **Lesson 1 Check**

1. List What are three characteristics of the sun?

The sun is the only star in our solar system; 99 percent of the mass in the solar system is taken up by the sun; and the sun's atmosphere has three layers.

2. Connect Why are the sun and the Alpha Centauri star system brighter than other stars visible to us on Earth?

They are the closest stars to us. The sun is the only star in our solar system, so it is visible. The Alpha Centauri star system includes the closest stars to the sun.

Jan 25-6:56 AM

21. What is the significance (importance) of the sun in our solar system?

The sun is the only star in our solar system, and it provides us with energy that supports life on Earth.

22. What size is the sun compared to other objects in our solar system?

The sun is the largest object in our solar system.

23. Complete the Lesson 1 Quiz: Brightness of the Sun and Other Stars on [pearsonrealize.com](https://www.pearsonrealize.com).

Jan 25-6:58 AM