



**Essential Question**

**What do we know about Earth and its neighbors?**



**Go Digital!**





# Discover the Universe

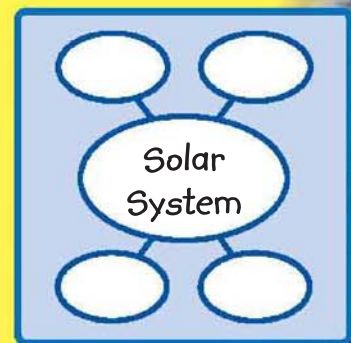
Look up at the sky. What do you see? Astronomers first learned about Earth and its neighbors by looking up.

- ▶ Today scientists use telescopes, satellites, and manned spaceships to study the universe.
- ▶ They make new discoveries every day about Earth and our solar system.

## Talk About It



Write words you have learned about our solar system. Talk with a partner about these discoveries.



# Vocabulary

Use the picture and the sentence to talk with a partner about each word.



**amount**

James drank a small **amount** of water.

*What could you use to carry a large amount of juice?*



**astronomy**

Kia looked at the stars when she studied **astronomy**.

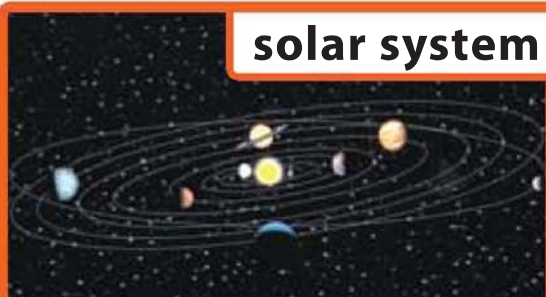
*What would you like to learn about astronomy?*



**globe**

Our Earth is a big, round **globe**.

*What is another word for globe?*



**solar system**

There are eight planets in our **solar system**.

*Name one planet in our solar system.*





**support**

My dad and I **support** our favorite baseball team by cheering.

What can you do to show your support?



**surface**

An astronaut walks on the dry, dusty **surface** of the moon.

Describe the surface of your desk.



**temperature**

We can have fun even when the **temperature** outside is cold.

What is the temperature where you are today?



**warmth**

Will and Paul cooked marshmallows over the **warmth** of a fire.

What is another word for warmth?

**Your Turn**

COLLABORATE

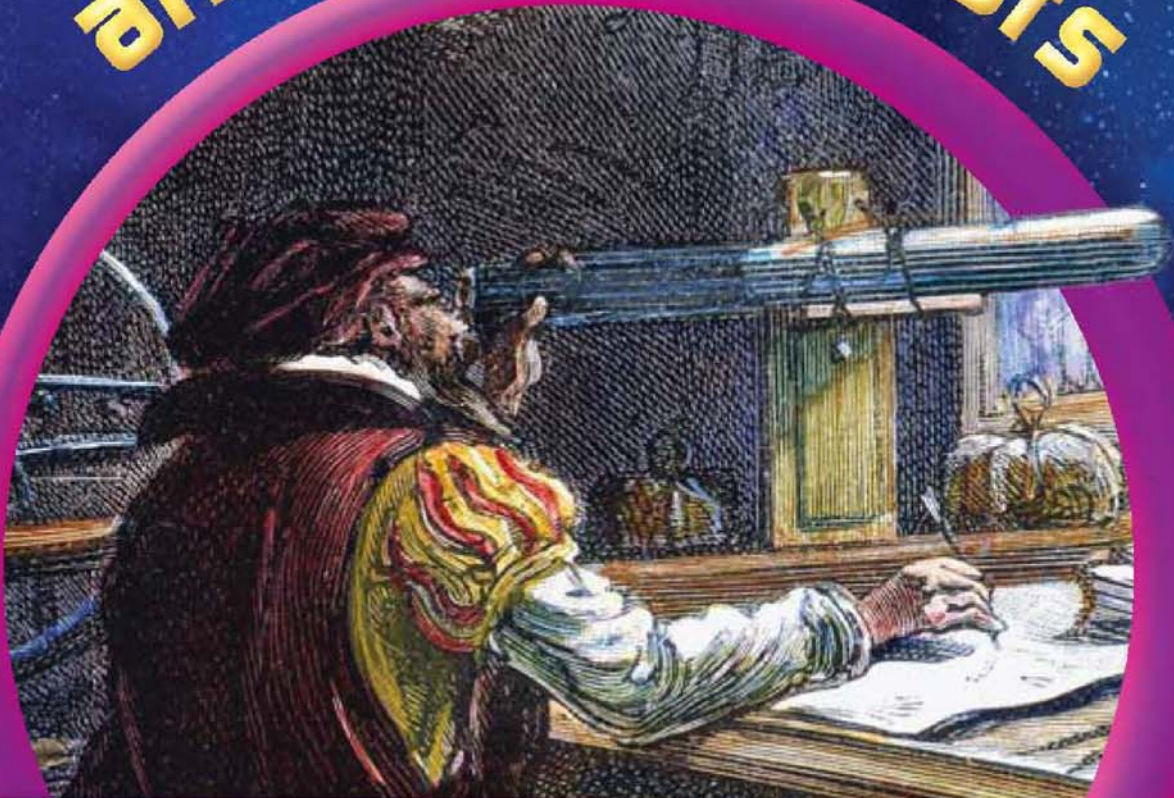


Pick three words. Then write three questions for your partner to answer.

**Go Digital!** Use the online visual glossary



# Earth and Its Neighbors



## Essential Question

What do we know about Earth and its neighbors?

Read about how we have learned about space.

Galileo studied the sky with a telescope he built.



If the Sun could talk, it might say, “Look at me! Look at my sunspots! I am so hot!” Without the Sun, Earth would be a cold, dark planet. How do we know this?

Thanks to the astronomer, Galileo, we know a lot about the Sun and the rest of our **solar system**.

## Telescopes: Looking Up

Galileo did not invent the **telescope**. However, 400 years ago he did build one that was strong enough to study the sky. When Galileo looked into space, he saw the rocky surface of the Moon. When he looked at the Sun, he discovered spots on its fiery surface.

**The Moon is Earth's  
closest neighbor.**





**Astronomy**, or the study of space, began with the simple telescope. But astronomers wanted to look at the sky more closely. They made bigger telescopes that could see further than the one Galileo used. Astronomers still had many questions.

## Satellites: A Step Closer

In 1958, scientists launched Explorer 1, the first American **satellite**, into space. It was an exciting day for America.

Soon many satellites circled the **globe** and took photographs of Earth, the Moon, stars, and other planets. They collected a large **amount** of information. Satellites even tracked the **temperature** on the planet Saturn.

Scientists have learned many things about the solar system from satellites. That's why they kept sending more into space. Soon there were hundreds of satellites in space making amazing discoveries, but astronomers wanted to know even more. That's why they found a way to put a man on the moon.



**Explorer 1  
takes off.**

## One Giant Leap

In 1961, Alan Shepard became America's first **astronaut**. He blasted off into space in a rocket and then turned around and came back to Earth. His short trip was a big success. Shepard's flight proved that people could go into space.

After Shepard, more astronauts went into space. Some orbited the Earth. Some walked on the dusty, bumpy **surface** of the Moon. They took pictures and collected Moon rocks. Astronauts wanted to answer some important questions. Did the Sun's **warmth** heat the moon? Could the Moon **support** life someday?



Astronaut Edwin "Buzz" Aldrin walks toward the Lunar Module. Aldrin left his footprints on the Moon.




Aldrin brought home this Moon rock.



Scientists studied the photographs and Moon rocks that the astronauts brought back. They made exciting discoveries using telescopes and satellites. But it wasn't enough. Scientists wanted to get closer to the other planets. Soon they found a way!

## Hubble and Beyond

Scientists created another telescope, but this time it was gigantic. They sent it up into space. The Hubble Space Telescope was launched in 1990. It's still up there and orbits the Earth above the clouds. It takes clear, close-up photographs of stars and planets. It sends fascinating information back to Earth. The Hubble helps scientists study Earth and its neighbors. It also helps astronomers see planets outside our solar system.



**It takes the Hubble Telescope 96 minutes to orbit the Earth.**

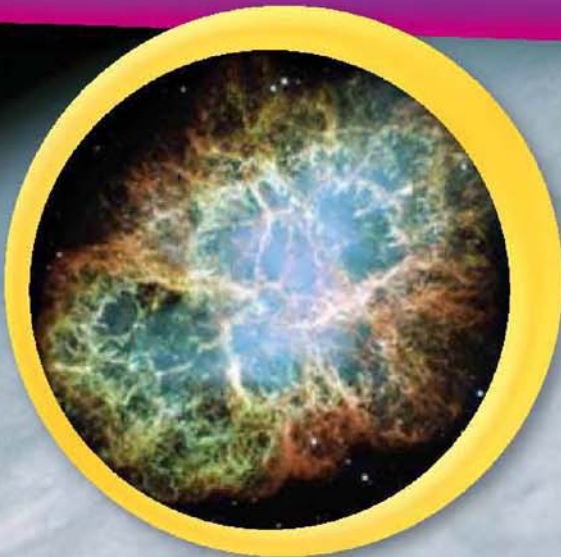


## More Discoveries Every Day

Scientists are still asking questions about Earth and its neighbors in space. With the help of satellites, telescopes, and astronauts they will continue to **explore** and find answers.

### What Can We See?

With Our Eyes	With a Simple Telescope	With the Hubble Telescope
The Moon	Craters on the Moon	Planets outside our solar system
The Sun	Sunspots	Stars bigger than the Sun and far, far away
Mars	Clouds around Jupiter	Jupiter's surface



**This is a Hubble Telescope photo of an exploding star.**

### Make Connections



How have we learned about Earth and its neighbors in space? **ESSENTIAL QUESTION**

What do you see when you look at the sky? **TEXT TO SELF**