1 Our Solar System

LET'S GET STARTED

Rathna and the Ring of Fire
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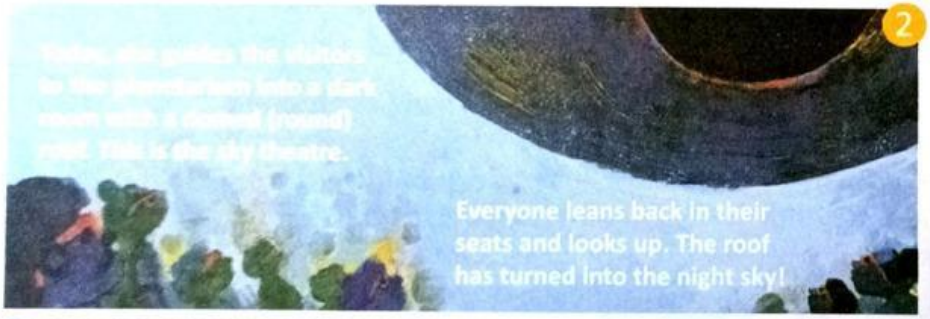
Rathna is an astronomer at the planetarium. She shows people the best views of stars, planets and distant galaxies.



Learning Outcomes

At the end of this lesson, learners will be able to:

- **examine** the concept of the universe.
- **discover** the galaxies and the stars.
- **demonstrate** knowledge of the eight planets—their order, names and sizes.
- **analyse** the differences between the eight planets of the solar system.
- **identify** satellites.

Let's Talk

What do you see when you look up in the night sky?

21ST CENTURY SKILLS — CRITICAL THINKING

Words to Know

astronomer: a person who studies and knows a lot about the Sun, the Moon, planets and stars
planetarium: a place where one can go to see what the night sky looks like
observatories: a large building with telescopes and other scientific instruments to help scientists study stars, planets and other objects in space

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We Shall Learn

THE UNIVERSE

The universe is a vast, endless space. This space contains various heavenly bodies, such as the Sun, planets, thousands and thousands of stars and the Moon.

HOW DID THE UNIVERSE BEGIN?

THE BIG BANG

1

Thousands and thousands of years ago, the universe began as a tiny hot compact point.

2 Then came a big explosion called the **Big Bang**, when the universe began to expand. Much of the universe was made of gases. Gradually, as the gases expanded, they began to cool down.

3 It took many, many years for these gases and dust to come together and form galaxies, stars, planets and more.

4

The matter that spread out after the Big Bang slowly took shape into everything that is there in the universe today—including us!

5 Many scientists use this theory to explain the creation of the universe. However, what caused the Big Bang in the first place remains a mystery!

Words to Know

compact: when something is made smaller or firmer by pressing it
explosion: when something bursts with a lot of force and a loud noise
expand: to spread further and fill up more space
gas: something such as air that is neither solid nor liquid
matter: (here) the substance that everything in the universe is made of

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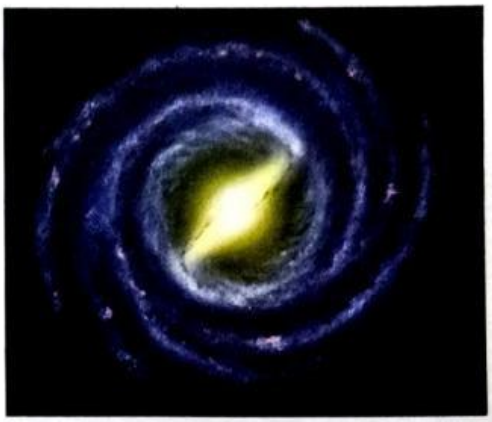
The universe also contains dust, gases and pieces of rocks. It is bigger than anything we can ever imagine.

The Galaxies and Stars

A **star** is a ball of **hot gases** that burn all the time and glow like a big fire. A huge collection of stars along with gases and dust is called a **galaxy**. There are many galaxies in the universe.



The Milky Way Galaxy: Our Earth is part of this galaxy.

Have you ever looked at the stars at night? They are of different sizes. However, all stars look very small because they are very far away from us. Stars have their own light and heat, and they shine all the time in the sky. During the day, the light from the Sun is so bright that we are unable to see the light of other stars in the sky.

Our Earth receives heat and light from the Sun, which makes all forms of life—humans, plants and animals—possible on the Earth. Our Earth is one of the eight planets of the solar system.

The Planets

The eight planets are heavenly bodies which move around the Sun on fixed paths known as orbits. All planets are of nearly the same shape but are different in size. Planets have no light or heat of their own. They shine because they reflect the light received from the Sun.

Word to Know
orbit: the path taken by an object moving around a larger object in space

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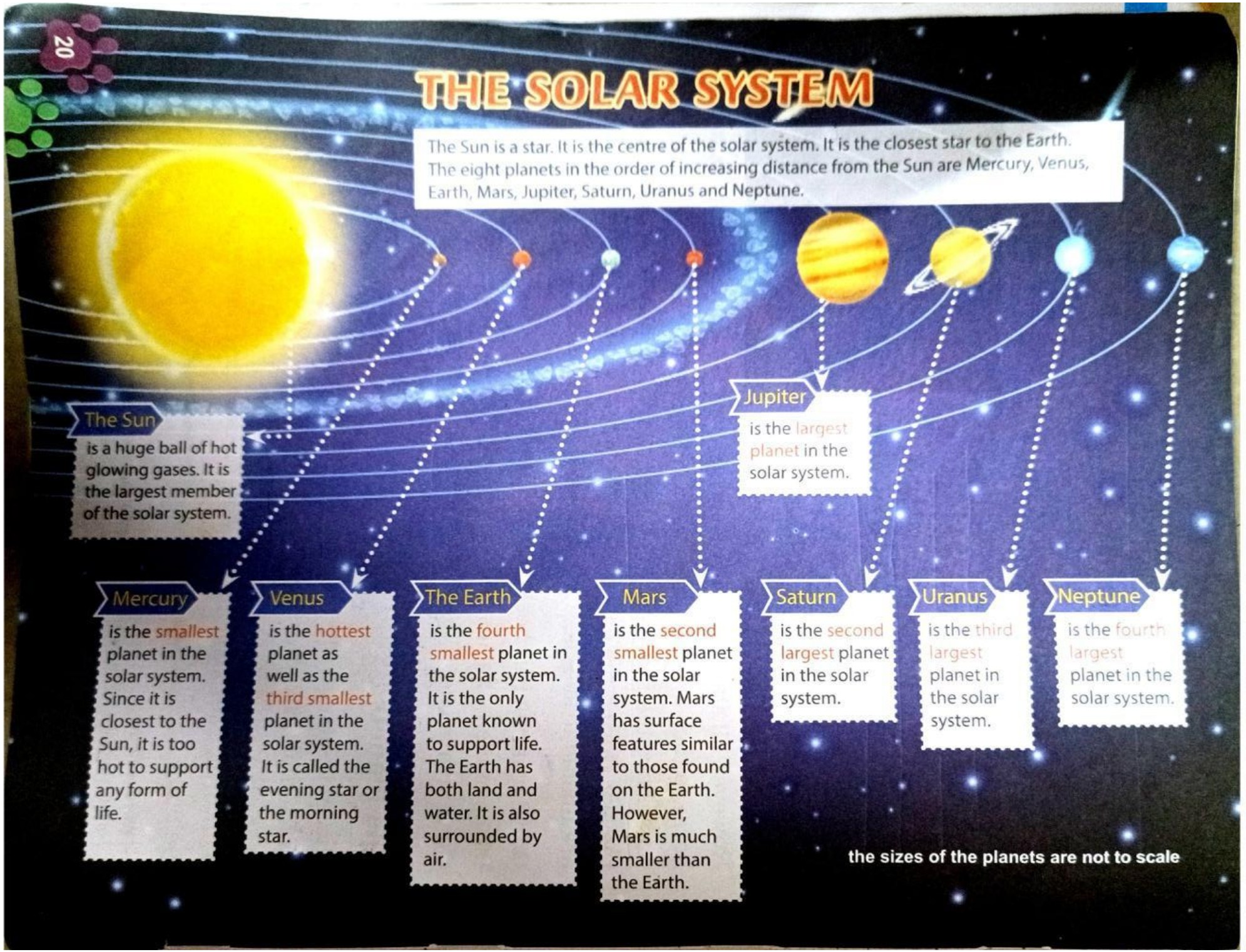
THE SOLAR SYSTEM

The Sun is a star. It is the centre of the solar system. It is the closest star to the Earth. The eight planets in the order of increasing distance from the Sun are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.



The Sun
is a huge ball of hot glowing gases. It is the largest member of the solar system.

Jupiter
is the largest planet in the solar system.

Mercury
is the smallest planet in the solar system. Since it is closest to the Sun, it is too hot to support any form of life.

Venus
is the hottest planet as well as the third smallest planet in the solar system. It is called the evening star or the morning star.

The Earth
is the fourth smallest planet in the solar system. It is the only planet known to support life. The Earth has both land and water. It is also surrounded by air.

Mars
is the second smallest planet in the solar system. Mars has surface features similar to those found on the Earth. However, Mars is much smaller than the Earth.

Saturn
is the second largest planet in the solar system.

Uranus
is the third largest planet in the solar system.

Neptune
is the fourth largest planet in the solar system.

the sizes of the planets are not to scale

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Satellites

The Moon moves around the Earth.

A **satellite** is a heavenly body that revolves around a planet. Like planets, satellites also have no light of their own. Other than Mercury and Venus, all other planets have satellites. The Earth has only one natural satellite, known as the Moon.

ZoOm In

DID YOU KNOW?

A group of stars that forms a recognisable pattern in the sky and has been given a name by the International Astronomical Union is known as a constellation. Orion (the Hunter) and Ursa Major (the Great Bear) are two of the 88 constellations recognised by the International Astronomical Union.

Chapter Checklist

21ST CENTURY SKILLS — SELF-DIRECTION — SELF-ASSESSMENT

Tick (✓) the concepts you have understood.

- The Sun, stars and other heavenly bodies are located in the universe. ✓
- The Sun is a star. It is a huge ball of hot, glowing gases that provides heat and light to us, which makes life possible on the Earth. ✓
- Our planet Earth is a part of the solar system, which is located in the Milky Way Galaxy. ✓
- Eight planets revolve around the Sun in our solar system. ✓
- A satellite revolves around a planet. Our Earth has only one natural satellite, the Moon. ✓

EXERCISES

I. Write 'T' for true or 'F' for false.

1. Life can exist on the Earth because the Sun provides us heat and light. T
2. The Sun is a satellite. F

Words to Know

revolve: to turn or spin around a central point
natural: existing in nature, not made or caused by humans

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3. With the Big Bang, the universe began to expand slowly. T
4. The Milky Way Galaxy is the only galaxy in the universe. F
5. A satellite is a heavenly body revolving around the Sun. F

II. Guess my name.

1. I am the sixth planet from the Sun and I have rings.
   Saturn
2. I am the hottest planet in the solar system.
   Venus
3. I am the largest planet in the solar system.
   Jupiter
4. I am the Earth's only natural satellite.
   Moon
5. I am the planet closest to the Sun.
   Mercury

III. Answer the following questions.

1. What is a star?
2. How is a star different from a planet?
3. Why is life possible on the Earth?
4. Name the eight planets in the solar system.
5. What is a satellite?

21ST CENTURY SKILLS CRITICAL THINKING

IV. Think It Over! (HOTS)

When you see the Moon at night, it looks bright. However, the Moon does not have its own light. How does it glow?

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