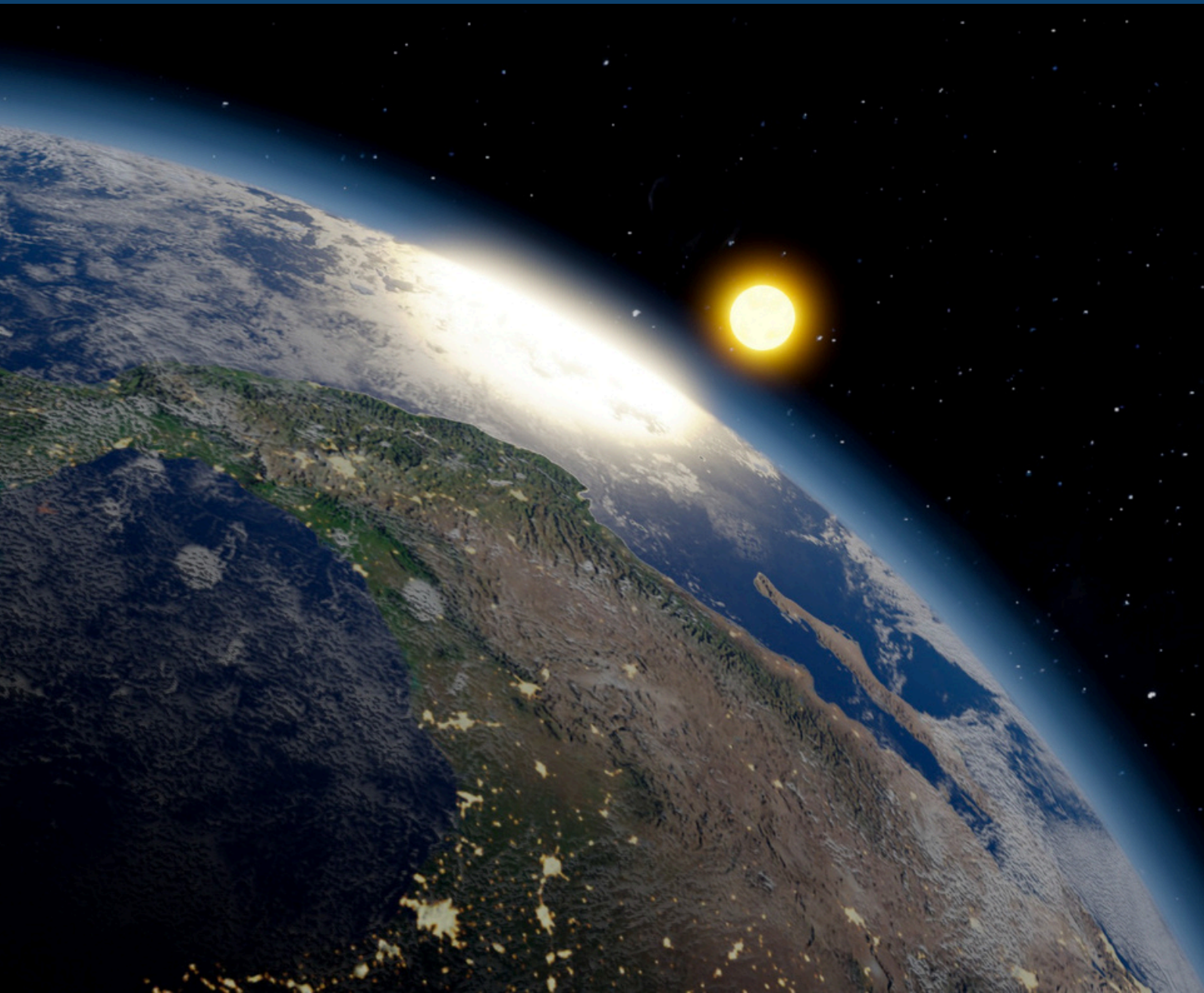




**Britannica  
EDUCATION**

# **Earth, the Sun and the Moon: Understanding Our Place in Space**

Learning Resources and Activities





## Introduction

# The Earth, the Sun, and the Moon

The movements of the Earth, Sun and Moon shape the daily and seasonal patterns we experience on our planet. From the rising and setting of the sun to the changing shape of the moon, students often see these natural phenomena but may not understand the science behind them.

This pack provides a clear, curriculum-aligned introduction to the Earth's rotation, orbit, and the Moon's role in the solar system. It focuses on helping students connect everyday observations to scientific explanations using models, visuals, and explicit teaching.

Understanding how the Earth, Sun and Moon interact helps students:

- Develop foundational scientific knowledge
- Practice reasoning and model-building skills
- Improve scientific vocabulary and comprehension
- Build confidence and curiosity about the world beyond Earth

# Activity Overview

This pack includes a **single-session lesson** (45–60 minutes) designed to:

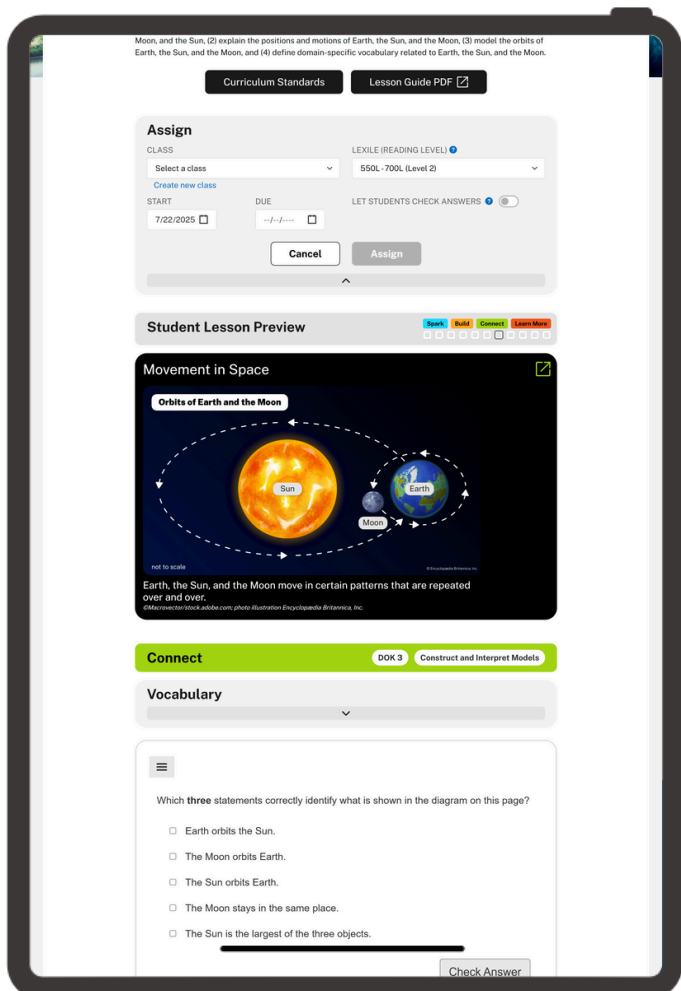
1. Explain the **rotation of the Earth** and how it causes day and night.
2. Demonstrate the **orbits** of the Earth around the Sun and the Moon around the Earth.
3. Build a simple **visual model** to help students organise their understanding.
4. Connect learning to **real-world phenomena** (e.g. sunrise, sunset, moon phases).

## Students will:

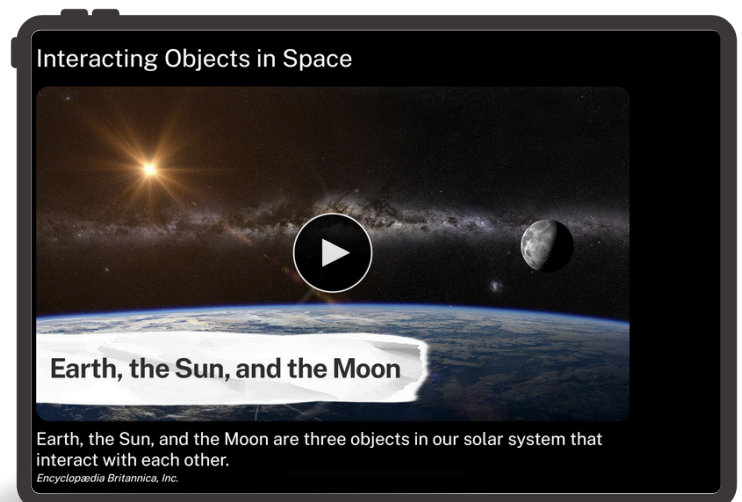
- Watch a short Britannica video to build background knowledge
- Participate in a teacher-led demonstration using objects or a digital model
- Take part in a guided “shadow and orbit” simulation
- Complete a drawing task to show their understanding
- Reflect on their learning through discussion and/or exit slips



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Expedition Learn**



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<https://elearn.eb.com/expedition-learn>



# Why Teach This?

Understanding the **relationship between the Earth, Sun and Moon** helps students grasp the causes of **day and night, phases of the moon, and seasons**. These big ideas form the foundation of astronomy, timekeeping, and spatial awareness; all of which are core to science literacy.

This activity builds curiosity, strengthens scientific thinking, and encourages students to connect what they observe in the sky to real science.

## Who Will Benefit?

- **Students aged 7–12** (Years 3–6) who are beginning to understand planetary systems
- **Teachers** looking for *low-prep*, and *engaging* science activities
- **Schools** aiming to improve science outcomes through hands-on learning and explicit teaching methods

## Why Scientific Literacy Matters for Student Confidence and Lifelong Learning

Science is more than a subject. In fact, it's a way of thinking, questioning, and making sense of the world. When we teach science explicitly and meaningfully, we can build **scientific literacy**.

### What Is Scientific Literacy?

Scientific literacy means students can:

- Understand key science ideas and processes
- Interpret data and evidence
- Ask questions and solve problems using logical reasoning
- Make connections between science and their everyday life







## How Does Scientific Literacy Builds Self-Efficacy

Self-efficacy is a student's belief in their ability to succeed at a task. In science, this grows when students:

- **Understand what's expected** (clear learning intentions and success criteria)
- **See real-world relevance** (e.g. observing day and night, moon phases)
- **Feel successful** through scaffolded activities and reflection
- **Build on prior knowledge** with familiar concepts (light, movement, Earth)

When students experience success in science, they're more likely to:

- Participate actively
- Take risks in inquiry tasks
- Retain knowledge longer
- See themselves as capable science learners

## Confidence Fuels Long-Term Engagement

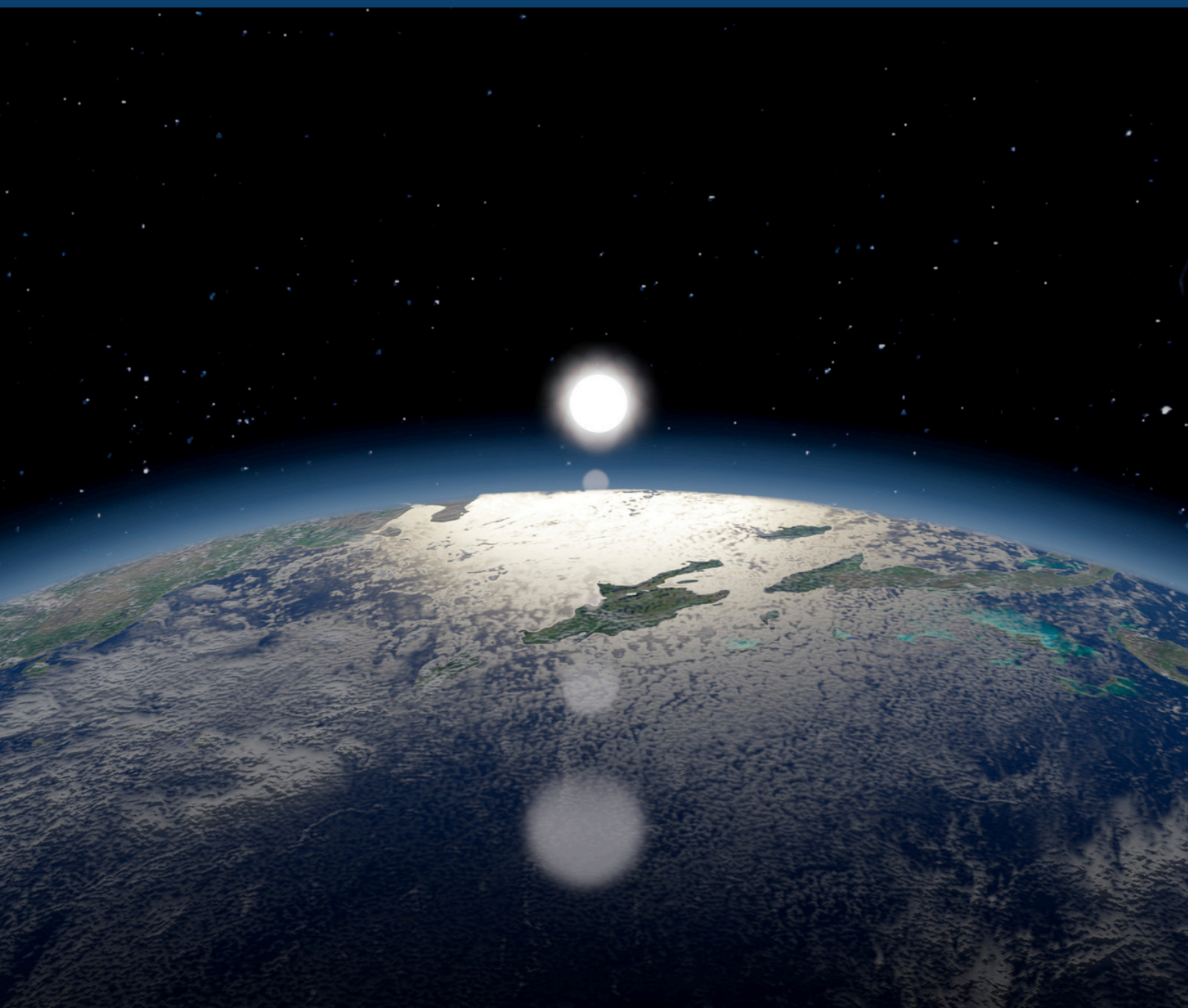
Explicit science instruction, just like the lesson in this pack, supports students in mastering:

- Scientific vocabulary
- Model-based reasoning
- Data interpretation and explanation

These are core transferable skills that support learning in STEM, literacy, and critical thinking beyond primary school.

Lesson Plan

# Exploring Earth, the Sun, and the Moon





# Lesson Summary

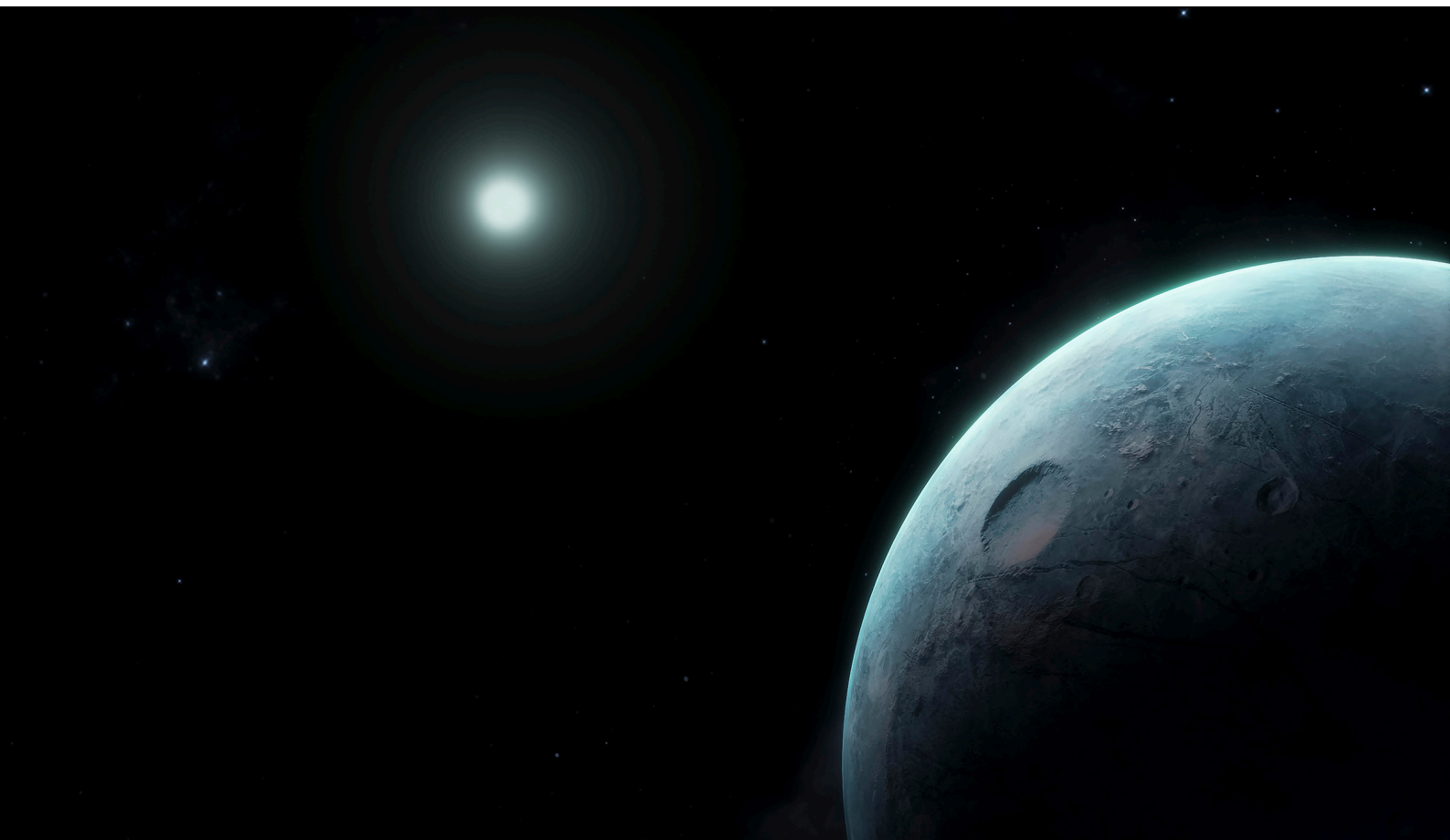
## Lesson Objectives

By the end of the lesson, students will be able to:

1. describe characteristics of Earth, the Moon, and the Sun
2. explain the positions and motions of Earth, the Sun, and the Moon
3. model the orbits of Earth, the Sun, and the Moon, and
4. define domain-specific vocabulary related to Earth, the Sun, and the Moon.

## Background

- This lesson introduces students to the Earth-Sun-Moon system. Earth, the Sun, and the Moon are all objects in our solar system.
- Students learn each object's characteristics, age, and position, as well as the orbital paths of Earth and the Moon. Additionally, students explore how interactions of the Sun, Earth, and the Moon cause moon phases as well as how interactions of the Sun and Earth cause the seasons.
- Earth, the Sun, and the Moon are just a few of the objects found in our solar system, along with dwarf planets, asteroids, meteoroids, and comets. Earth and the Moon both have rocky surfaces and are composed of three layers: the core, mantle, and crust.
- Both the Moon and Earth rotate and revolve in a counterclockwise motion. While the Moon revolves around Earth, Earth revolves around the Sun.
- Both objects have orbital patterns. The Moon takes around 27 days to orbit Earth, and Earth takes about 365 days to orbit the Sun.







- Earth and the Moon are able to stay in their orbits because of gravity. Just as the Sun's gravity influences Earth's orbit, Earth's gravity influences the Moon's orbit.
- The Sun is the center of our solar system and is composed mostly of hydrogen and helium. The Sun is average-sized compared to other stars. The Sun's inner layer consists of a core, a radiative zone, and a convection zone. The photosphere, chromosphere, and corona make up the Sun's atmosphere.
- This lesson builds on students' knowledge of objects found in the solar system. Students previously learned that the Sun is a star that provides light and heat to Earth. Heat from the Sun warms Earth's land, water, and air.
- The Moon does not give off its own light, but it reflects light from the Sun. Telescopes are tools that can help people observe objects in the sky, such as stars and moons, more clearly than with an unaided eye.

## Common Misconceptions

- Students may believe that the Sun and the Moon are the same size.
- Emphasise to students that the Sun and the Moon only appear to be the same size because of their distances from Earth.
- The Sun is actually 400 times larger in diameter than the Moon, but it appears to be the same size as the Moon when viewed from Earth because it is much farther away.

# Key Inquiry Questions

Use these to guide student thinking throughout the lesson.

## Activate Prior Knowledge:

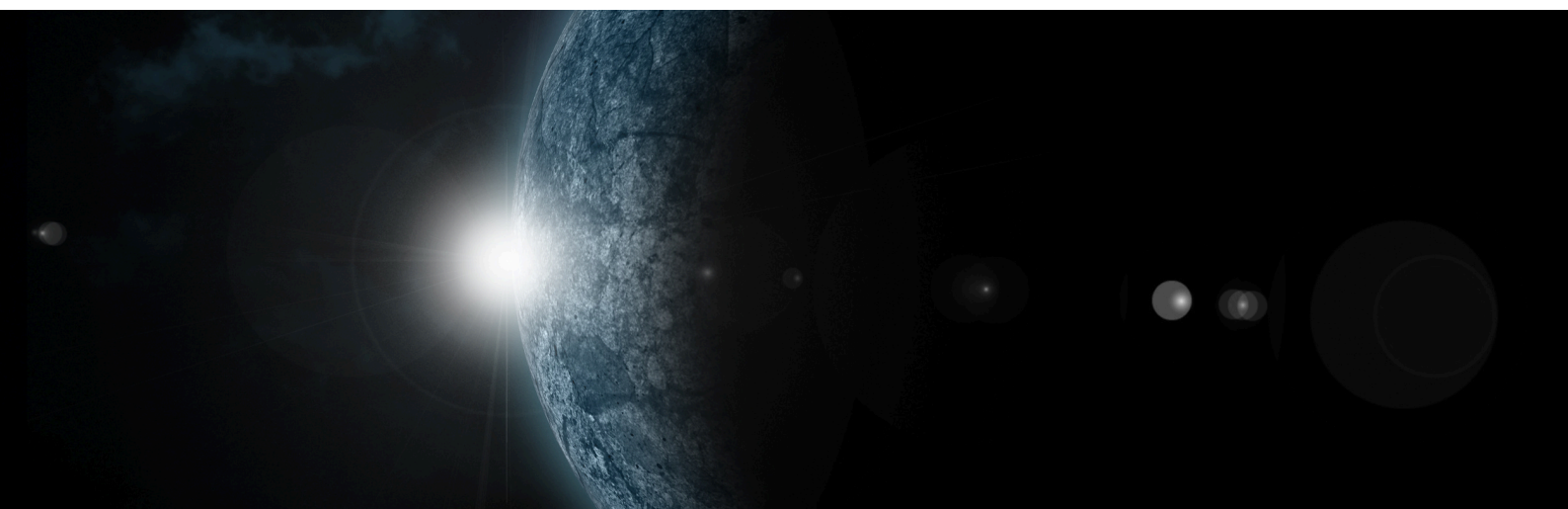
- What do you already know about the Earth, the Sun, or the Moon?
- Have you ever seen the Moon and the Sun in the sky at the same time?

## Build Understanding:

- What are some key differences between the Earth, Sun, and Moon?
- What type of object is the Sun? How is it different from a planet or a moon?
- How do Earth and the Moon move around the Sun? What patterns can we observe from Earth?

## Deepen Thinking:

- Why do we always see the same side of the Moon from Earth?
- How does understanding the Sun help us understand the rest of the solar system?



# Teacher-Guided Instruction Sequence

→ **Pre-class task:** ASSIGN Britannica Science Lesson: [Earth, the Sun and the Moon](#) to your class.

If your school is not yet subscribed to Expedition: Learn, you can request free trial access for you and your students at <https://elearn.eb.com/expedition-learn>

## 1. Introduction (5–7 min)

Explain the learning intention and success criteria aloud.

*"Today we are going to learn about the Earth, the Moon, and the Sun — what they are made of, how big they are, and how they move around each other."*

Show the Spark Video on at the start of the Britannica Science: Expedition Learn lesson.



## 2. Direct Teaching (10–15 min)

Use teacher-led visuals (diagram, model, or animation) to explain:

- The **Sun** is a star, made of hydrogen and helium, over 100 times wider than Earth
- **Earth** is a planet with a core, mantle, and crust, orbiting the Sun
- The **Moon** is a rocky satellite that orbits Earth and shares similar internal layers
- All three formed over **4.5 billion years ago**

Use a ball-and-torch model or digital simulation to show:

- The Sun at the center
- Earth orbiting the Sun
- The Moon orbiting Earth

**Reinforce vocabulary:** orbit, rotation, satellite, star, axis, solar system



### 3. Guided Practice (15 min)

Ask students to complete an assigned activity in the Britannica Science: Expedition Learn lesson.

### 4. Independent Task (10–15 min)

Complete *Activity 1: Exploring Size, Distance, and Orbits*

Optional: Complete *Activity 2: True or False*, and *Activity 3: Quiz*

### 5. Review & Reflect (5 min)

Ask students to turn and talk:

- What's one new thing you learned about the Moon or the Sun?
- What still makes you curious about space?

Optional Exit Ticket:

1. Write one fact about the Sun: \_\_\_\_\_
2. Write one question you still have: \_\_\_\_\_

**Name:**



## Activity 1: Exploring Size, Distance, and Orbits

From Earth, the Sun and Moon appear to be about the same size in the sky. But are they really the same size? In this activity, you'll explore how size and distance affect what we see from Earth, and discover the predictable patterns of orbit.

### 1. Warm-Up: What Do You Think?



Think about this question and write your answer below:

🤔 If the Sun and the Moon appear to be the same size in the sky, does that mean they are actually the same size? Why or why not?

Your answer:

---

---

### 2. Size Comparison: Basketball vs Tennis Ball

Imagine Earth is the size of a basketball. The Moon would be the size of a tennis ball. The Sun would be HUGE — more than 100 times bigger than Earth.

Draw and label the following objects to scale (as best you can):

- Earth (basketball)
- Moon (tennis ball)
- Sun (make it as large as you can on the page!)



✏️ Use the space below to draw your diagram:

### 3. Orbit Patterns

Match each object to its orbit:



a) Earth



b) Moon



c) Comet

1

Orbits the Sun  
once every 365  
days

2

Orbits the Earth  
once every 27  
days

3

Orbits the Sun in a  
long, stretched  
path

Answers: a) \_ b) \_ c) \_

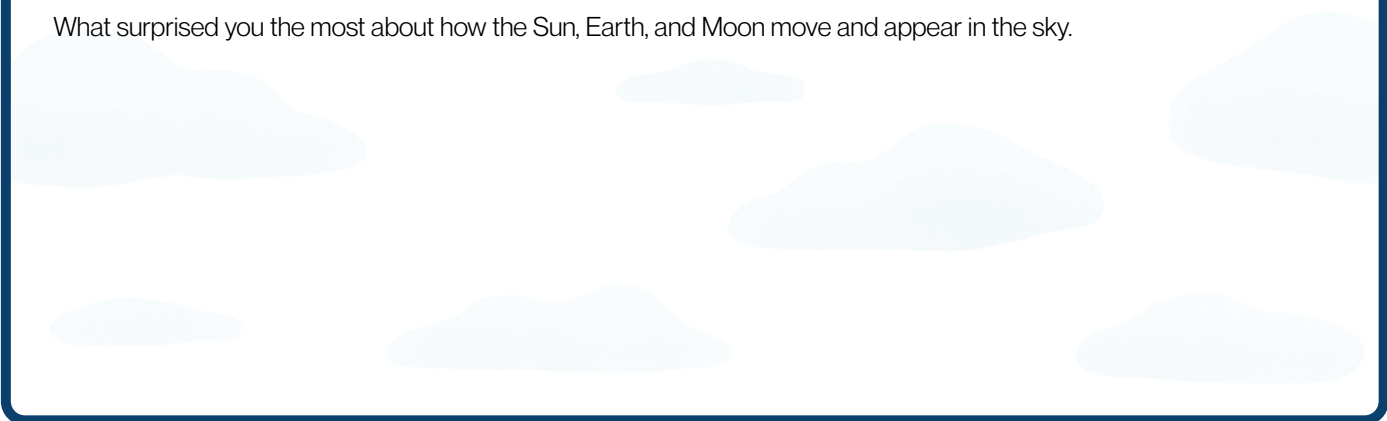
### 4. Earth's Tilt and Seasons

Earth is tilted as it orbits the Sun. That tilt causes seasons. In the space below, draw Earth orbiting the Sun at four points in the year (summer, autumn, winter, spring). Add arrows to show which way Earth is tilted at each point.



### 5. Reflect and Connect

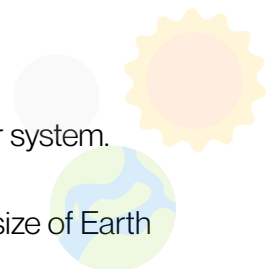
What surprised you the most about how the Sun, Earth, and Moon move and appear in the sky.





**Name:**

## Activity 2: True or False

- 
1. The Sun is a planet that orbits Earth. ☐ ☐
  2. Earth is the largest planet in the solar system. ☐ ☐
  3. The Moon is about one-quarter the size of Earth. ☐ ☐
  4. Earth orbits the Sun once every 365 days. ☐ ☐
  5. The Moon orbits the Sun, just like Earth. ☐ ☐
  6. The Sun is mostly made of hydrogen and helium gases. ☐ ☐
  7. The size difference between Earth and the Moon is like a basketball and a tennis ball. ☐ ☐
  8. The Sun and Moon look the same size in the sky because they are the same distance from Earth. ☐ ☐
  9. The Moon takes about 27 days to orbit Earth. ☐ ☐
  10. An orbit is a straight line path around an object. ☐ ☐
  11. Earth's tilt causes the seasons. ☐ ☐
  12. The Sun is about 109 times wider than Earth. ☐ ☐
  13. The Moon produces its own light. ☐ ☐
  14. Earth's orbit is random and unpredictable. ☐ ☐
  15. One year is the time it takes Earth to orbit the Moon. ☐ ☐
  16. Comets are made of ice and rock. ☐ ☐
  17. The Sun is about 1.3 million times smaller than Earth. ☐ ☐
  18. The same side of the Moon always faces Earth. ☐ ☐
  19. The Moon's phases are caused by its changing shape. ☐ ☐
  20. Dwarf planets, asteroids, and comets all orbit the Sun. ☐ ☐

**Name:**

**Date:**



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### Activity 3: Quiz: Earth, the Sun and the Moon

**1. Which object is the largest?**

- a) Earth
- b) Moon
- c) Sun

**2. How long does it take Earth to orbit the Sun once?**

- a) 27 days
- b) 100 days
- c) 365 days

**3. What is the Moon made of?**

- a) Gas
- b) Rock
- c) Fire

**4. What causes day and night on Earth?**

- a) The Moon's orbit
- b) Earth's rotation
- c) Earth orbiting the Sun

**5. How does the Moon shine in the night sky?**

- a) It glows on its own
- b) It reflects light from the Sun
- c) It reflects light from Earth

**6. Which object is about the size of a tennis ball compared to Earth as a basketball?**

- a) Sun
- b) Mars
- c) Moon

**7. What causes the seasons on Earth?**

- a) The Moon's shadow
- b) The Sun moving closer and farther
- c) Earth's tilt and orbit

**8. How far is the Moon from Earth on average?**

- a) 384,400 km
- b) 150,000 km
- c) 1 million km

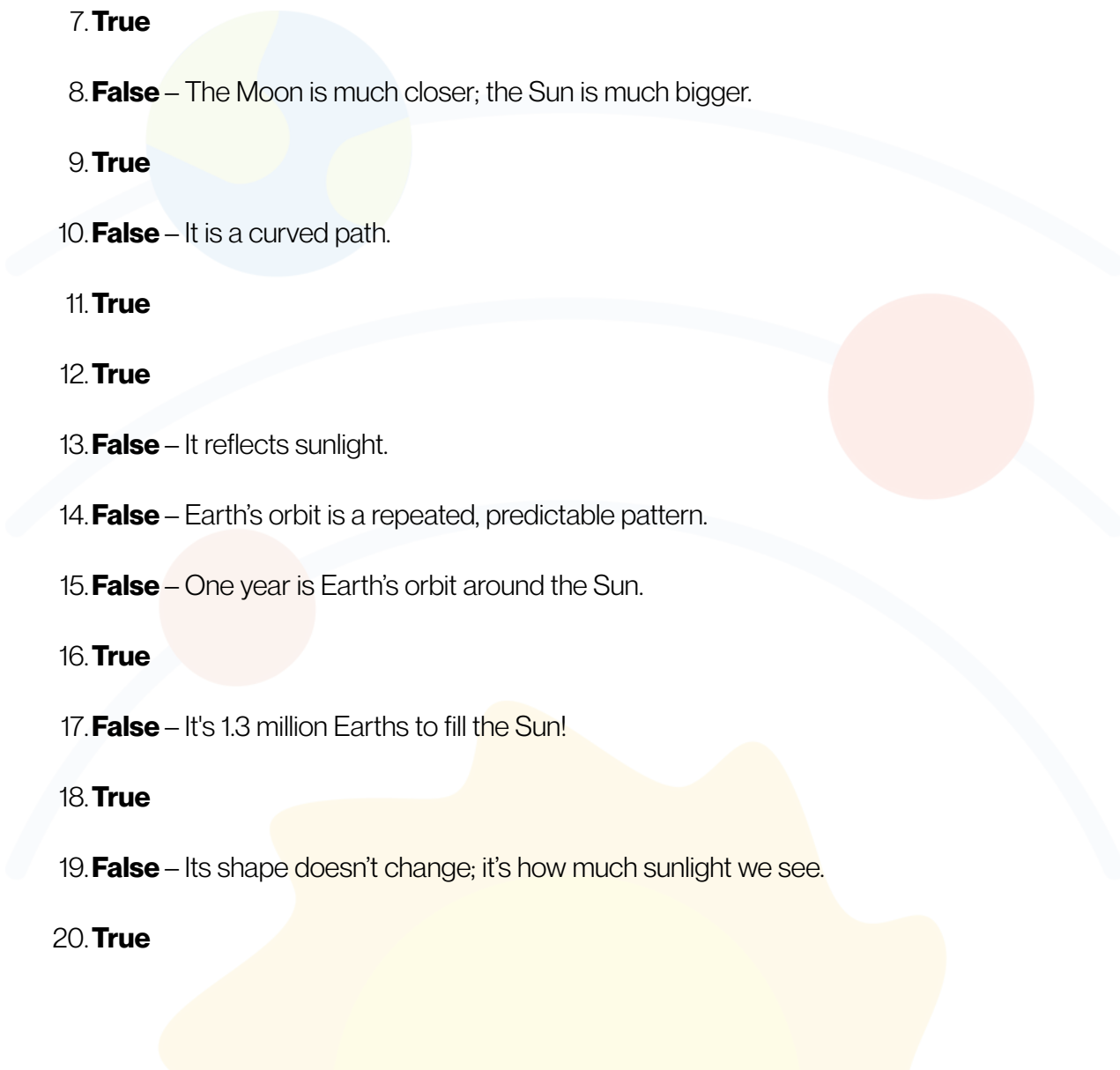
**9. What does the word "orbit" mean?**

- a) Spin in place
- b) Travel around another object
- c) Bounce back light

**10. Which of these objects is a star?**

- a) Earth
- b) Moon
- c) Sun

## Activity 2 - True or False

1. **False** – The Sun is a star at the center of the solar system.
  2. **False** – Earth is the fifth largest planet.
  3. **True**
  4. **True**
  5. **False** – The Moon orbits Earth.
  6. **True**
  7. **True**
  8. **False** – The Moon is much closer; the Sun is much bigger.
  9. **True**
  10. **False** – It is a curved path.
  11. **True**
  12. **True**
  13. **False** – It reflects sunlight.
  14. **False** – Earth's orbit is a repeated, predictable pattern.
  15. **False** – One year is Earth's orbit around the Sun.
  16. **True**
  17. **False** – It's 1.3 million Earths to fill the Sun!
  18. **True**
  19. **False** – Its shape doesn't change; it's how much sunlight we see.
  20. **True**
- 

## Activity 3 - Quiz: Earth, the Sun and the Moon

- **Which object is the largest?**

✓ Answer: C) Sun

- **How long does it take Earth to orbit the Sun once?**

✓ Answer: C) 365 days

- **What is the Moon made of?**

✓ Answer: B) Rock

- **What causes day and night on Earth?**

✓ Answer: B) Earth's rotation

- **How does the Moon shine in the night sky?**

✓ Answer: B) It reflects light from the Sun

- **Which object is about the size of a tennis ball compared to Earth as a basketball**

✓ Answer: C) Moon

- **What causes the seasons on Earth?**

✓ Answer: C) Earth's tilt and orbit

- **How far is the Moon from Earth on average?**

✓ Answer: A) 384,400 km

- **What does the word “orbit” mean?**

✓ Answer: B) Travel around another object

- **Which of these objects is a star?**

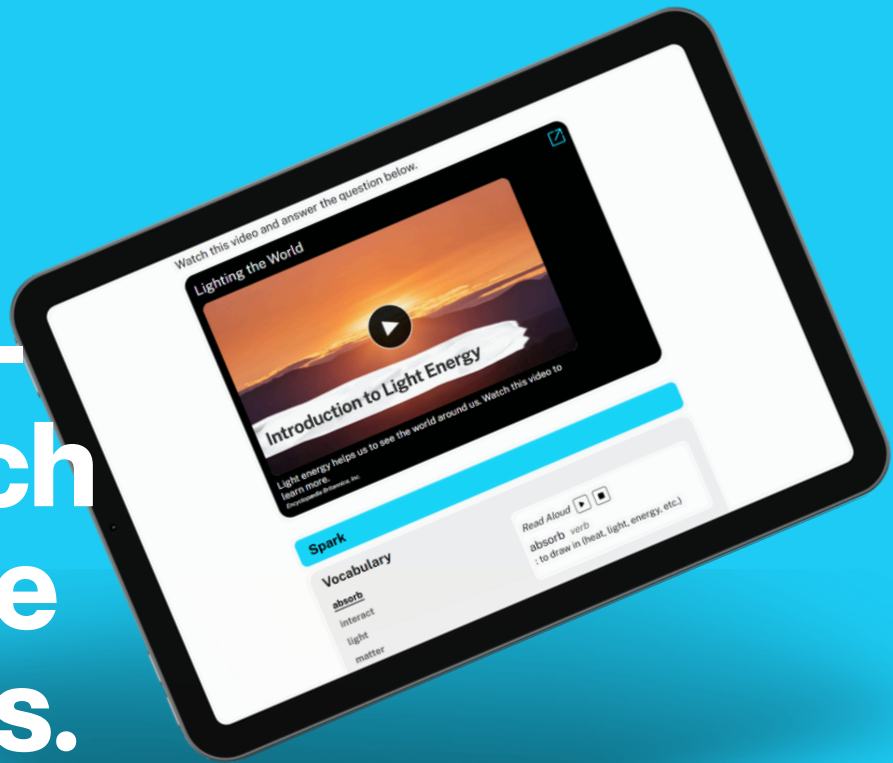
✓ Answer: C) Sun





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