

## Photo Description



This picture shows tall buildings in a city during the day. The sun is shining bright between the buildings. There are trees and grass in front of the city buildings.

## Scientific Phenomena

The Anchoring Phenomenon is the daily movement of the sun across the sky, creating shadows and bright sunlight at different times of day. This happens because Earth rotates (spins) on its axis once every 24 hours. As Earth spins, different parts of our planet face toward or away from the sun, creating day and night. The bright sunlight visible between the buildings shows how the sun's position changes throughout the day as Earth continues its rotation.

## Core Science Concepts

1. Earth's Rotation: Our planet spins like a top, making one complete turn every 24 hours, which creates day and night cycles.
2. Sun's Apparent Movement: The sun appears to move across the sky from east to west, but it's really Earth that is moving.
3. Light and Shadows: When sunlight hits objects like buildings, it creates shadows that change size and direction as Earth rotates.
4. Daily Patterns: We can observe predictable patterns in how sunlight changes throughout each day.

### Pedagogical Tip:

Have students track the sun's position by observing shadows on the playground at different times during the school day. This concrete observation helps them understand abstract concepts about Earth's rotation.

### UDL Suggestions:

Provide multiple ways for students to represent their understanding: drawing pictures of shadows, acting out Earth's rotation with their bodies, or creating simple diagrams with moveable sun and Earth models.

## Zoom In / Zoom Out

1. Zoom In: Light travels in straight lines from the sun to Earth. When these light rays hit solid objects like buildings, they cannot pass through, creating dark areas called shadows on the opposite side.
2. Zoom Out: Earth is part of our solar system, where it orbits around the sun while also spinning on its axis. This movement affects not just our city, but creates day and night patterns for people all around the world.

### Discussion Questions

1. What do you notice about where the sun is in this picture? (Bloom's: Observe | DOK: 1)
2. How do you think the shadows from these buildings might look different in the morning compared to the afternoon? (Bloom's: Predict | DOK: 2)
3. Why do you think we see the sun in different parts of the sky throughout the day? (Bloom's: Analyze | DOK: 3)
4. What patterns do you notice about sunlight and shadows every day? (Bloom's: Analyze | DOK: 2)

### Potential Student Misconceptions

1. Misconception: The sun moves around Earth during the day.  
Clarification: Earth spins while the sun stays in the same place, making it look like the sun is moving across our sky.
2. Misconception: Shadows are always the same size and direction.  
Clarification: Shadows change throughout the day as Earth rotates and the sun appears in different positions in the sky.

### NGSS Connections

- Performance Expectation: 1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns that can be predicted.
- Disciplinary Core Ideas: 1-ESS1.A and 1-ESS1.B
- Crosscutting Concepts: Patterns and Cause and Effect

### Science Vocabulary

- \* Rotation: When something spins around like a top
- \* Shadow: A dark area made when something blocks light
- \* Pattern: Something that happens the same way over and over
- \* Axis: An imaginary line through the middle of Earth that it spins around
- \* Solar system: The sun and all the planets that go around it

### External Resources

Children's Books:

- The Magic School Bus Lost in the Solar System by Joanna Cole
- Sun Up, Sun Down by Gail Gibbons
- Shadows and Reflections by Tana Hoban

YouTube Videos:

- "Day and Night Explanation for Kids" - Simple animation showing Earth's rotation and day/night cycle: [https://www.youtube.com/watch?v=p\\_NR\\_C8s7XY](https://www.youtube.com/watch?v=p_NR_C8s7XY)
- "Shadow Science for Kids" - Demonstrates how shadows change throughout the day with fun experiments: <https://www.youtube.com/watch?v=zBLHp5VgfEI>