

Photo Description



This image shows the glass walls of a tall building reflecting another building nearby. The glass windows act like mirrors, showing the shape and windows of the other building. You can see how light bounces off the smooth glass surface to create this mirror-like effect.

Scientific Phenomena

The Anchoring Phenomenon is reflection of light from smooth surfaces. When light rays hit the smooth glass windows of this building, they bounce back at the same angle they came in, following the law of reflection. This creates a mirror-like image of the nearby building. The glass acts as a reflective surface because it is very smooth and flat, allowing light to bounce off in an organized way rather than scattering in all directions like it would from a rough surface.

Core Science Concepts

1. Light Reflection: Light travels in straight lines and bounces off smooth surfaces at predictable angles, creating mirror images.
2. Surface Properties: Smooth, flat surfaces like glass create clear reflections, while rough surfaces scatter light in many directions.
3. Light Behavior: Light can be absorbed, transmitted through materials, or reflected back depending on the material's properties.
4. Mirror Images: Reflections appear reversed from left to right compared to the original object.

Pedagogical Tip:

Have students use small mirrors and flashlights to explore how the angle of incoming light equals the angle of reflected light. This hands-on experience helps them understand the predictable nature of reflection.

UDL Suggestions:

Provide multiple ways for students to explore reflection: tactile experiences with actual mirrors, visual demonstrations with laser pointers (teacher use only), and kinesthetic activities where students "act out" light rays bouncing off surfaces.

Zoom In / Zoom Out

1. Zoom In: At the molecular level, smooth glass surfaces have tightly packed molecules that create an even surface. When light photons hit these organized molecules, they bounce back in a uniform pattern, preserving the image.

2. Zoom Out: This reflection phenomenon is part of larger urban heat island effects. Glass buildings reflect sunlight and heat throughout cities, affecting local temperature patterns and energy use in surrounding buildings.

Discussion Questions

1. What would happen to the reflection if the glass windows were scratched or dirty? (Bloom's: Predict | DOK: 2)
2. How is this building reflection similar to and different from your reflection in a bathroom mirror? (Bloom's: Compare | DOK: 2)
3. Why can you see the reflection better on sunny days than on cloudy days? (Bloom's: Analyze | DOK: 3)
4. If you were designing a building, how might you use reflection to help or prevent certain effects? (Bloom's: Create | DOK: 4)

Potential Student Misconceptions

1. Misconception: "The building is actually inside the glass."
Clarification: The building image is a reflection - light bouncing off the glass surface brings the image to our eyes, but the building itself remains in its original location.
2. Misconception: "Only mirrors can create reflections."
Clarification: Any smooth, shiny surface can create reflections including water, polished metal, and glass windows.
3. Misconception: "Light gets trapped in the glass."
Clarification: Light bounces off the glass surface and travels to our eyes - it doesn't stay in the glass.

NGSS Connections

- Performance Expectation: 4-PS4-2 - Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen
- Disciplinary Core Ideas: 4-PS4.B - An object can be seen when light reflected from its surface enters the eyes
- Crosscutting Concepts: Cause and Effect - Students identify the cause (smooth glass surface) and effect (clear reflection)
- Science and Engineering Practices: [[NGSS:SEP:Developing and Using Models]] - Students can model how light reflects off surfaces

Science Vocabulary

- * Reflection: When light bounces off a surface and travels back toward where it came from
- * Surface: The outside or top layer of something that light can hit
- * Angle: The direction that light travels when it hits and bounces off something
- * Absorb: When a material takes in light instead of bouncing it back
- * Transmit: When light passes through a clear material like glass or water

External Resources

Children's Books:

- Bouncing and Bending Light by David Dreier
- Light by David Dreier
- Mirrors and Reflections by Karen Bryant-Mole

YouTube Videos:

- "Light Reflection for Kids" - Simple explanation of how light bounces off different surfaces with fun demonstrations: <https://www.youtube.com/watch?v=y7tWOHQ6Xss>
- "Bill Nye Light and Color" - Engaging segment on light behavior including reflection with clear examples: <https://www.youtube.com/watch?v=yzqSI6l2Sfw>