

## Photo Description



The picture shows a tall glass building. The glass acts like a mirror and shows another building inside it. The glass windows make a pattern of squares all over the building.

## Scientific Phenomena

This image demonstrates reflection as an anchoring phenomenon. Light rays from the surrounding building bounce off the smooth glass surface of the modern building, creating a mirror-like image. This occurs because glass has a smooth, shiny surface that reflects light in a predictable way, allowing us to see images of objects that are not directly in front of us.

## Core Science Concepts

1. Light and Reflection: Light bounces off smooth, shiny surfaces like glass and mirrors, allowing us to see reflections of objects.
2. Properties of Materials: Different materials interact with light in different ways - glass can be both transparent (see-through) and reflective depending on lighting conditions.
3. Patterns in Nature and Human-Made Objects: The building shows repeating patterns of windows and reflections that create visual designs.

### Pedagogical Tip:

Use a handheld mirror during the lesson to let students explore reflection firsthand. Have them reflect light onto the ceiling or walls to make the abstract concept concrete and engaging.

### UDL Suggestions:

Provide multiple ways for students to demonstrate understanding by having them draw what they see, use hand gestures to show light bouncing, or verbally describe reflections to accommodate different learning preferences.

## Zoom In / Zoom Out

1. Zoom In: At the molecular level, light waves hit the smooth glass surface and bounce back at the same angle they arrived, creating the reflection we see.
2. Zoom Out: This building is part of a larger urban environment where many glass buildings create a "canyon effect," reflecting light and heat throughout the city, affecting local temperature and lighting conditions.

### Discussion Questions

1. What do you think would happen if we shined a flashlight on this glass building? (Bloom's: Apply | DOK: 2)
2. How is this glass building similar to a mirror in your bathroom? (Bloom's: Analyze | DOK: 2)
3. Why can we see the other building in the glass but not see inside the glass building? (Bloom's: Analyze | DOK: 3)
4. What other things around school create reflections like this building? (Bloom's: Remember | DOK: 1)

### Potential Student Misconceptions

1. Misconception: "The other building is inside the glass building."  
Clarification: The building we see is actually a reflection - like looking in a mirror. The other building is across the street.
2. Misconception: "Only mirrors can show reflections."  
Clarification: Any smooth, shiny surface can create reflections, including water, glass, and polished metal.

### NGSS Connections

- Performance Expectation: 1-PS4-3: Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light.
- Disciplinary Core Ideas: 1-PS4.B - Objects can be seen if light is available to illuminate them or if they give off their own light.
- Crosscutting Concepts: Patterns - Patterns in the natural and human designed world can be observed and used as evidence.

### Science Vocabulary

- \* Reflection: When light bounces off a surface like a mirror or glass.
- \* Transparent: Something you can see through clearly, like clean glass.
- \* Surface: The outside or top part of something.
- \* Pattern: Something that repeats over and over in the same way.
- \* Material: What something is made of, like glass, wood, or metal.

### External Resources

Children's Books:

- Mirrors and Reflections by David Dreier
- Light by David Dreier
- What Is Light? by Robin Johnson

YouTube Videos:

- "Light and Shadows for Kids" - Simple explanation of how light travels and reflects, perfect for primary grades: [https://www.youtube.com/watch?v=\\_5VINCUXkM8](https://www.youtube.com/watch?v=_5VINCUXkM8)
- "Reflection and Refraction for Kids" - Basic concepts about light bouncing and bending with easy demonstrations: <https://www.youtube.com/watch?v=8YgrVNjZDIE>