Reflection

Physical Science | Lesson Guide

Kindergarten

Photo Description

This picture shows tall buildings with lots of glass windows. One building is reflecting in the windows of another building. The glass acts like a big mirror showing the other building's shape and windows.

Scientific Phenomena

The Anchoring Phenomenon demonstrated here is reflection of light. When light hits the smooth glass surface of the building, it bounces back like a ball bouncing off a wall. The glass windows act as mirrors because they are smooth and shiny. This creates a clear image of the nearby building appearing in the glass surface. The reflection happens because light travels in straight lines and follows predictable patterns when it hits different surfaces.

Core Science Concepts

1. Light Reflection: Light bounces off smooth, shiny surfaces like glass and mirrors
2. Properties of Materials: Different materials (glass, metal, concrete) interact with light in different ways
3. Observable Patterns: Reflections create predictable images that can be seen and described
4. Light Sources and Vision: We can see reflections because light bounces from objects to our eyes

> **Pedagogical Tip:**
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> Use a flashlight and small mirror during circle time to demonstrate how light bounces. Have students predict where the reflected light will appear on the wall, then test their predictions together.

> **UDL Suggestions:**
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> Provide multiple ways for students to explore reflection: tactile experiences with different textured materials, visual demonstrations with flashlights, and kinesthetic activities where students act out light "bouncing" off surfaces.

Zoom In / Zoom Out

1. Zoom In: At the microscopic level, light is made of tiny packets of energy called photons. When these photons hit the smooth glass surface, they bounce off at the same angle they arrived, creating the reflection we see.

2. Zoom Out: This building reflection is part of urban heat island effects in cities. Glass buildings reflect sunlight and heat throughout the city, affecting local weather patterns and energy use across entire metropolitan areas.

Discussion Questions

1. What do you notice about the building in the glass? (Bloom's: Remember | DOK: 1)
2. Why do you think we can see one building reflected in another building's windows? (Bloom's: Analyze | DOK: 2)
3. What other things have you seen your reflection in besides mirrors? (Bloom's: Apply | DOK: 2)
4. How might the reflection change if it was nighttime instead of daytime? (Bloom's: Evaluate | DOK: 3)

Potential Student Misconceptions

1. Misconception: "The other building is inside the glass"
   Clarification: The building image is a reflection bouncing off the outside of the glass, not actually inside it

2. Misconception: "Only mirrors can show reflections"
   Clarification: Any smooth, shiny surface can create reflections, including water, glass, and polished metal

3. Misconception: "Reflections are always exactly the same size as the real object"
   Clarification: Reflections can appear different sizes depending on distance and the shape of the reflecting surface

NGSS Connections

- Performance Expectation: K-PS2-1: Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object
- Disciplinary Core Ideas: K-PS2.A
- Crosscutting Concepts: Patterns

Science Vocabulary

* Reflection: When light bounces off a surface like a ball bouncing off a wall
* Surface: The outside part of something you can touch
* Mirror: A smooth, shiny surface that shows reflections clearly
* Light: Energy that helps us see things around us
* Glass: A smooth, clear material used to make windows
* Shiny: A surface that reflects light well and looks bright

External Resources

Children's Books:
- Moonbear's Shadow by Frank Asch
- Shadows and Reflections by Tana Hoban
- Light by David Dreier

YouTube Videos:
- "What is Light? | Physics for Kids" - Simple explanation of light and reflection with colorful animations: https://www.youtube.com/watch?v=50Md_KCVH3s
- "Reflection and Mirrors | Science for Kids" - Demonstrates how mirrors and reflections work with easy experiments: https://www.youtube.com/watch?v=gX_HtaGV_0s