

## Photo Description



Red flowers sit in a clear glass vase on a shiny table. The flowers have long green stems and bright red petals. You can see the flowers reflected in the mirror behind the table.

## Scientific Phenomena

The anchoring phenomenon is light reflection - we can see the flowers appearing twice because light bounces off the mirror's smooth surface back to our eyes. This happens because mirrors have a very smooth, shiny surface that reflects light rays at the same angle they hit it. The reflection creates what appears to be another set of flowers behind the mirror, even though they're not really there.

## Core Science Concepts

1. Light travels in straight lines - Light moves from the flowers to our eyes and also bounces off the mirror
2. Reflection occurs when light bounces off surfaces - Smooth, shiny surfaces like mirrors reflect light better than rough surfaces
3. Mirrors create images that appear to be behind the surface - The reflected image looks like it's the same distance behind the mirror as the real object is in front
4. Transparent materials allow light to pass through - We can see through the clear glass vase because light travels through it

### Pedagogical Tip:

Have students use flashlights and small mirrors to explore how light bounces at different angles. This hands-on experience helps them understand that reflection follows predictable patterns.

### UDL Suggestions:

Provide multiple ways for students to demonstrate understanding: drawing ray diagrams, acting out light's path with their bodies, or using digital tools to create before/after images showing objects and their reflections.

## Zoom In / Zoom Out

1. Zoom In: At the microscopic level, smooth mirror surfaces have tiny particles arranged in very even, flat patterns that bounce light rays back uniformly, while rough surfaces scatter light in many directions.
2. Zoom Out: Reflection is essential in nature - animals use reflection in water to find drinking sources, and many creatures have evolved reflective surfaces for camouflage, communication, or protection from predators.

## Discussion Questions

1. What would happen to the reflection if we moved the flowers closer to the mirror? (Bloom's: Predict | DOK: 2)
2. Why can we see through the glass vase but not through the table? (Bloom's: Analyze | DOK: 2)
3. How is the reflection similar to and different from the real flowers? (Bloom's: Compare | DOK: 2)
4. What other objects in this room might create reflections, and why? (Bloom's: Apply | DOK: 3)

## Potential Student Misconceptions

1. Misconception: The flowers in the mirror are real objects behind the mirror.

Clarification: Reflections are images created by light bouncing off the mirror - nothing actually exists behind the mirror surface.

2. Misconception: Only mirrors can create reflections.

Clarification: Any smooth, shiny surface can create reflections including water, polished metal, or even phone screens.

3. Misconception: Light from our eyes helps us see the reflection.

Clarification: Light travels from light sources (like the room's lights) to objects, then bounces to our eyes - our eyes don't produce light.

## 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: Cause and Effect - Simple tests can be designed to gather evidence to support or refute student ideas about causes

## Science Vocabulary

- \* Reflection: When light bounces off a surface back to your eyes
- \* Transparent: Materials you can see through clearly, like glass or water
- \* Image: A picture or copy of something that appears in a mirror or reflection
- \* Light source: Something that makes its own light, like the sun or a lamp
- \* Surface: The outside or top part of something you can touch

## External Resources

### Children's Books:

- Mirrors and Reflections by David Dreier
- Light and Shadow by Karen Bryant-Mole
- What Is Light? by Robin Johnson

### YouTube Videos:

- "Light and Reflection for Kids" - Simple explanation of how mirrors work with fun demonstrations: <https://www.youtube.com/watch?v=y7tWOhduTzU>



## Reflection — 3rd Grade Lesson Guide

- 
- "Bill Nye Light and Color" - Engaging exploration of light properties including reflection: [https://www.youtube.com/watch?v=\\_8W3FklvVMs](https://www.youtube.com/watch?v=_8W3FklvVMs)