Reflection

Physical Science | Lesson Guide

1st Grade

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 in a mirror too.

Scientific Phenomena

The Anchoring Phenomenon is light reflection creating mirror images. When light hits the smooth, shiny surface of the mirror, it bounces back at the same angle it came in, creating a reversed image of the flowers and room. This demonstrates how light travels in straight lines and reflects predictably off smooth surfaces, allowing us to see objects that aren't directly in our line of sight.

Core Science Concepts

1. Light Reflection - Light bounces off smooth, shiny surfaces like mirrors and creates images we can see
2. Properties of Materials - Some materials are shiny and smooth (like mirrors), while others are rough or dull
3. Light Sources and Shadows - Light comes from sources (like the lamp visible) and travels to help us see objects
4. Living vs. Non-living - The flowers are living things that need water, while the mirror and vase are non-living objects

Pedagogical Tip:

Use a flashlight and small mirror during the lesson to let students experiment with reflecting light onto the wall or ceiling. This hands-on experience helps them understand that light bounces off mirrors in predictable ways.

UDL Suggestions:

Provide multiple ways for students to explore reflection: tactile experiences with different textured materials (smooth vs. rough), visual demonstrations with flashlights and mirrors, and kinesthetic activities where students "bounce" like light rays off different surfaces.

Zoom In / Zoom Out

1. Zoom In: At the microscopic level, the mirror's surface is incredibly smooth and flat, allowing light waves to bounce off uniformly. The glass molecules are arranged in a way that creates this perfect reflective surface.

2. Zoom Out: Reflection is everywhere in nature - in lakes, puddles, and even animal eyes. This same principle helps animals see predators, helps us navigate using car mirrors, and allows telescopes to gather light from distant stars.

Discussion Questions

1. What happens when you look in a mirror? (Bloom's: Remember | DOK: 1)
2. Why can we see the flowers in the mirror even though they're not behind it? (Bloom's: Analyze | DOK: 2)
3. How do you think the reflection would change if we moved the flowers to a different spot? (Bloom's: Apply | DOK: 2)
4. What other things in our classroom or home act like mirrors? (Bloom's: Apply | DOK: 2)

Potential Student Misconceptions

1. Misconception: "The mirror has another room inside it"
   Clarification: Mirrors don't contain objects - they reflect light to show us images of things in front of them

2. Misconception: "Only mirrors can reflect things"
   Clarification: Many smooth, shiny surfaces can reflect light, including water, metal spoons, and phone screens

3. Misconception: "The reflection is exactly the same as the real object"
   Clarification: Reflections are reversed - what's on the left appears on the right in the mirror

Cross-Curricular Ideas

1. Math + Science: Counting and Symmetry - Have students count the petals on each flower, then count how many flowers appear in the mirror. Introduce the concept of symmetry by showing how the mirror image is a mirror version of the real flowers (same number, but reversed position).

2. ELA + Science: Descriptive Writing - Ask students to write or dictate sentences describing what they see in the mirror versus what they see in real life. Use words like "bright," "shiny," "red," and "reflection." Create a class book of mirror observations.

3. Art + Science: Mirror Drawing - Have students look at themselves in mirrors while drawing their own faces or drawing objects and then trying to draw their mirror reflections. This combines art skills with understanding how reflections work and how images appear reversed.

4. Social Studies + Science: Community Helpers - Connect to the florist or decorator who arranges flowers for special events, discussing how mirrors in stores and homes help people see products and spaces better.

STEM Career Connection

1. Optometrist/Eye Doctor - Eye doctors help people see better by using special tools and mirrors to look inside eyes. They make sure light enters your eyes correctly so you can see the world clearly. They might use mirrors similar to the one in this photo to help them do their work. Average Annual Salary: $120,000 - $130,000

2. Lighting Designer - These scientists and artists choose where to put lights and mirrors in buildings, theaters, and stores to make spaces bright and beautiful. They think about how light bounces off mirrors and surfaces to create the perfect lighting for a room (like the lamp and mirror in this photo). Average Annual Salary: $50,000 - $70,000

3. Physicist - Physicists study how light works and why it bounces off mirrors in special ways. They do experiments with light and mirrors to discover new things and create inventions that use light, like lasers, cameras, and telescopes. Average Annual Salary: $120,000 - $145,000

NGSS Connections

Performance Expectation: 1-PS4-3 - Plan and conduct an investigation 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
* Mirror: A smooth, shiny surface that reflects light very well
* Light: Energy that helps us see things around us
* Surface: The outside or top part of something
* Image: A picture or copy of something we can see

External Resources

Children's Books:
- Mirrors and Reflections by David Dreier
- Light Is All Around Us by Wendy Pfeffer
- What Is Light? by Robin Johnson