Disappearing Glass Rods

Third Grade
Activity: 4
Time: 1 Class Period

General Description

Understanding that light will bend and refract are basic principals of the properties of light. Giving students the opportunity to investigate the properties of light without forcing them to memorize definitions and concepts will cause them to develop a true understanding of the properties of light energy.

Objectives

Students will investigate the properties of light.
Students will discover the behavior of light and how it appears to bend.

Arizona State Standards

SC03 S1C1 PO1 Formulate relevant questions about the properties of objects, organisms, and events of the environment using observations and prior knowledge
SC03 S5C1 Energy and Magnetism: Investigate different forms of energy

W03 S3C2 SPO3 Write in a variety of expository forms (e.g., summary, newspaper article, reflective paper, log, journal).
W03 S3C3 SPO1 Write a variety of functional text (e.g., directions, recipes, procedures, rubrics, labels, graphs/tables).

Teacher Background

Glass objects are visible because they reflect some of the light that shines on them and bend or refract the light that shines through them. If you eliminate reflection from and refraction by a glass object, you can make that object disappear.

Materials (per student)

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Wesson™ oil (Regular, **not light**)
Water
One or more Pyrex® stirring rods or other small clear glass objects (marbles, glass drawer knobs, etc.)
Two beakers (or any clear container)
Optional: glass eyedropper, old eye glass lens

Procedure/Exploration

1. Have the students write in their journals what they see and explain what they think is happening.
2. Pour some Wesson™ oil into the beaker/container.
3. Pour some water into the other beaker/container.
4. Immerse a glass object in the oil.
5. Immerse another glass object (similar is better) into the water
6. Notice that the object becomes more difficult to see. Only a ghostly image of the object remains. If you do this as a demonstration, keep your audience at a distance to make it harder for them to see the ghost object.
7. Experiment with a variety of glass objects, such as clear marbles, lenses, and odd glassware. Some will disappear in the oil more completely than others.
8. You can make an eyedropper vanish before your eyes by immersing it and then sucking oil up into the dropper.
9. Experiment with a variety of glass objects, such as clear marbles, lenses, and odd glassware. Some will disappear in the oil more completely than others.
10. You can make an eyedropper vanish before your eyes by immersing it and then sucking oil up into the dropper

What's happening?

This activity introduces the concept of index of refraction. The index of refraction is a measure of how fast light travels through a material. When light travels through one substance and then travels through a different substance then the index of refraction is different and the light is forced to bend. The item in the substance will appear bent also. We are able to see the glass rod in the air because the index refraction is different for air and glass. The light will bend at the surface of the glass. When the glass rod is in the liquid the light bends less and it is harder to see.

Extension

You can also make a solid glass rod disappear by immersing it in mineral oil. You can purchase mineral oil in any pharmacy. Please be aware that mineral oil comes in light, medium, and heavy weights, and each variety has a different index of refraction. To match the index of refraction of the glass rod the closest you'll need a mixture of mineral oils of different weights. Giving students the opportunity to experiment with the amounts of each type of oil. ***Use this as an Inquiry Activity.***

Another Liquid

Test other types of clear liquids that you can find at the grocery store.

Disappearing Glass Rods Worksheet

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Student Name: **Date:**

1. Write your observations of a glass rod placed on the table top.

2. Draw a picture of what the glass rod in the liquid looks like.

3. Write your observations of a glass rod placed in the Wesson Oil.

4. Draw a picture of the glass rod in the Wesson Oil

5. Write your observations of a glass rod placed in water.

6. Draw a picture of a glass rod in water

7. In your own words explain what you saw happening with the glass rod in both liquids

8. If you continue the investigation with mineral oil and Karo syrup write your observations below.