

Lesson Plans: Simple Light Scattering

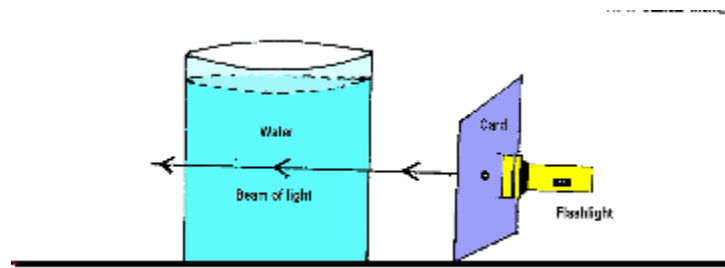
Objective

The objective is to show the effects of light scattering by particles, similar to the scattering of light by volcanic aerosols.

Materials

Each group of students will need the following:

- Large glass filled with water
- Whole milk
- Flashlight or other bright light beam source
- Piece of cardboard with a small hole (a few mm in diameter).



Procedure

1. Let a large glass of water sit for a while to let all the particles in the water settle.
2. Put the piece of cardboard in front of the flashlight's light beam so that it is touching the flashlight and a thin beam of light is coming out from the hole.
3. Then, aim the beam of the flashlight towards the glass so that it is passing through the water.
4. If the room is very dark, and the water very clean, you probably will not see much of a decrease in light emerging on the opposite side of the glass.
5. Slowly add more milk to the glass of water, taking note of the shape of the beam and the amount of light making it all the way through the water.

Questions

1. Does the amount of light reaching the opposite side of the glass change when you add the milk? How?
2. As more and more milk is added, the light coming into the glass is scattered in more directions, thus less of it is able to make it all the way through the glass. Do you agree? (This is similar to the presence of sulfuric acid droplets in the stratosphere and their effect on sunlight).

Note: This demonstration works best with a small aquarium to hold the water, as the sides of the aquarium are flat and the flashlight can be placed directly against one side of the aquarium.

