

Scattering Milk Lab

Name _____ Date _____

Laboratory Activity 2 (continued)

Data and Observations

Amount of Milk	Observations
No Milk	

Questions and Conclusions

1. What did you observe when the light traveled through the beaker that contained only water?

2. What did you observe when the light traveled through the beaker of water as you progressively added more milk?

It dims

3. Why did adding more milk to the beaker cause the image on the index card to change?

The light is absorbed & scattered

Strategy Check

Can you describe how a light beam is affected when it travels through a medium that does not contain other particles?

Can you describe how a light beam is affected as it travels through a medium that contains particles of another material?

Scattering of Light Waves



On a sunny day, you might have seen dust particles in a beam of sunlight. When light waves in the sunbeam strike a dust particle, they are reflected in all directions. This process, in which light traveling in one direction is made to travel in many directions, is called scattering. Sunlight is scattered when it strikes dust particles floating in the air. You see the dust particles as bright specks of light when some of these scattered light waves enter your eyes. Just like dust particles, tiny droplets of water in the air can cause scattering. Also, milk contains tiny particles of milk fat that can cause scattering of light waves.

Strategy

You will use a clear glass beaker, water, whole milk, and a flashlight to observe the scattering of light by particles of milk fat in a beaker of water. You will record your observations in a data table as more milk is added to the water.

Materials

- clear glass 500-mL beaker
- 50-mL beaker
- whole milk
- eye dropper
- small flashlight
- 3" x 5" index card (2)
- hole punch
- distilled water

Procedure

- Turn off the lights in the room and darken the room. Allow enough light into the room so that you can safely work.
- Put about 250 mL of distilled water into the 500-mL beaker.
- Put about 25 mL of whole milk into the 50-mL beaker. This will be used later in the lab.
- Use a hole punch to make a hole in one of the index cards. Position the hole so that the center of the flashlight goes through the hole when the card is sitting on the lab table.
- Place the index card with the hole next to the clear beaker of water. Have a lab partner hold the other index card about 30 cm away from the beaker directly opposite the index card with the hole.
- Turn on the flashlight and hold it against the index card with the hole. Position the flashlight so that the center of the beam goes through the hole in the index card. Observe the image on the index card on the other side of the beaker.
- Record your observations in your data table.
- Add ½ dropper of milk to the water in the beaker and stir. Repeat steps 5–7.
- Repeat step 8 until the water appears to look more like milk than water.