Light & Shadows – Water Magnifier

Ever looked closely at drops of water on a leaf? Did you notice what you can see by looking through the rounded bubble? This idea can be used to make a simple magnifier.

Materials:

- Clear plastics pop bottle
- Kitchen scissors
- Straw
- Stapler
- Ruler
- Drop of water
- Eye dropper or pipette (optional)
- Newspaper

Procedure: (Remember to have your parent's permission and have them watch and help you.)

- Cut a rectangular piece of plastic about 2.5 cm by 5 cm out of the pop bottle.
- Staple the straw to one end of the piece of plastic to make a handle for your magnifier.
- Using the dropper or your finger add one drop of water to the centre of the clear plastic.
- Try not to disturb the drop so it stays nice and round.
- Try out your magnifier. Hold it close to small print in a newspaper or flyer.
- Vary the distance of the drop from the print and observe what difference this makes.

What's Happening:

The lens in a magnifying glass are curved outwards (called a convex lens). A convex lens bends light on its return journey from the image underneath the lens to your eye, making the image appear larger or magnified.

Surface tension causes water drops to be spherical because the molecules inside a drop are attracted to each other in all directions, from the surface inward. The curvature observed in water is also a property of magnifiers. The more curved the magnifier, the stronger its magnification because it is bending more light in a shorter space.

As light enters the drop of water, it slows down and bends into a new path. Also, the rounded shape of the drop bends the light outwards. As the light spreads out, the image appears larger.

We see objects because light rays hit the objects and bounce off. Magnifiers take those light rays and bend them inward to focus on a point in space somewhere above the magnifier. By moving the magnifier toward and away from the object, you can refine where the point of magnification strikes your eye; that is create a clearer enlarged image of the object.

Extension:

Experiment with difference clear liquids like oil or syrup? Do you get the same results as you did with water?

This activity is based on our Light & Shadows kits. The source for this lab may be found at: http://www.madaboutscience.com.au/store/index.php?main_page=page&id=26. Our teaching kits (described on our website) are loaned out FREE to provide classroom teachers and parents of home schooled children an opportunity to explore Science in interesting ways. Please consider volunteering as a classroom guest speaker or offer your business as a field trip location.

Lorne Cooper, Regional Executive Director

PRAXIS, "Making Science Fun". Contact Praxis at praxis@praxismh.ca, www.praxismh.ca, Tweet or follow us @PraxisMedHat, or friend us on Facebook. Address: c/o 200 7th Street S.W., Medicine Hat, AB, T1A 4K1 Phone: 403-527-5365, Fax: 403-527-6570.