Magnifying Glass
A magnifying glass made of water? Impossible?

What to do: Straighten the paper clip. Form a small loop at one end of the wire and rub a little butter or cooking oil on it. Dip the loop into the glass of water and lift it out. You now have a lens—a kind of frame that holds a layer of water. Use the lens to read the small print in the telephone directory, the classified ads in the newspaper, and to see the fine details of the postage stamp.

Why: The water lens, just like a glass or plastic lens, has a definite shape. It bends light rays as they pass through it. First, it bends light as the light enters. Then it bends it again as the light leaves. The angle at which the water bends the light depends upon the shape of the lens.

Reflected light spreads out from the object you are looking at, hits the lens, and is bent back to your eye. Your eye sees the light as though it came on a straight line from the object—and the object seems to be much larger than it actually is.

YOU NEED
• paperclip
• butter or cooking oil
• glass of water
• telephone directory, newspaper, and postage stamp

Be careful not to put too many scratches into the metal of the paper clip when you are bending it with the needle-nose pliers. Scratches can disrupt the shape of the water droplet, resulting in a poor or distorted image. If you are having trouble holding the wire while making the loops, use a vice instead of your hands. It can help if the object you are looking at is brightly illuminated. If indoors, try using a desk lamp with a cone-shaped shade to focus bright light onto the specimen. For best results outside, use the paper clip microscope on sunny days.