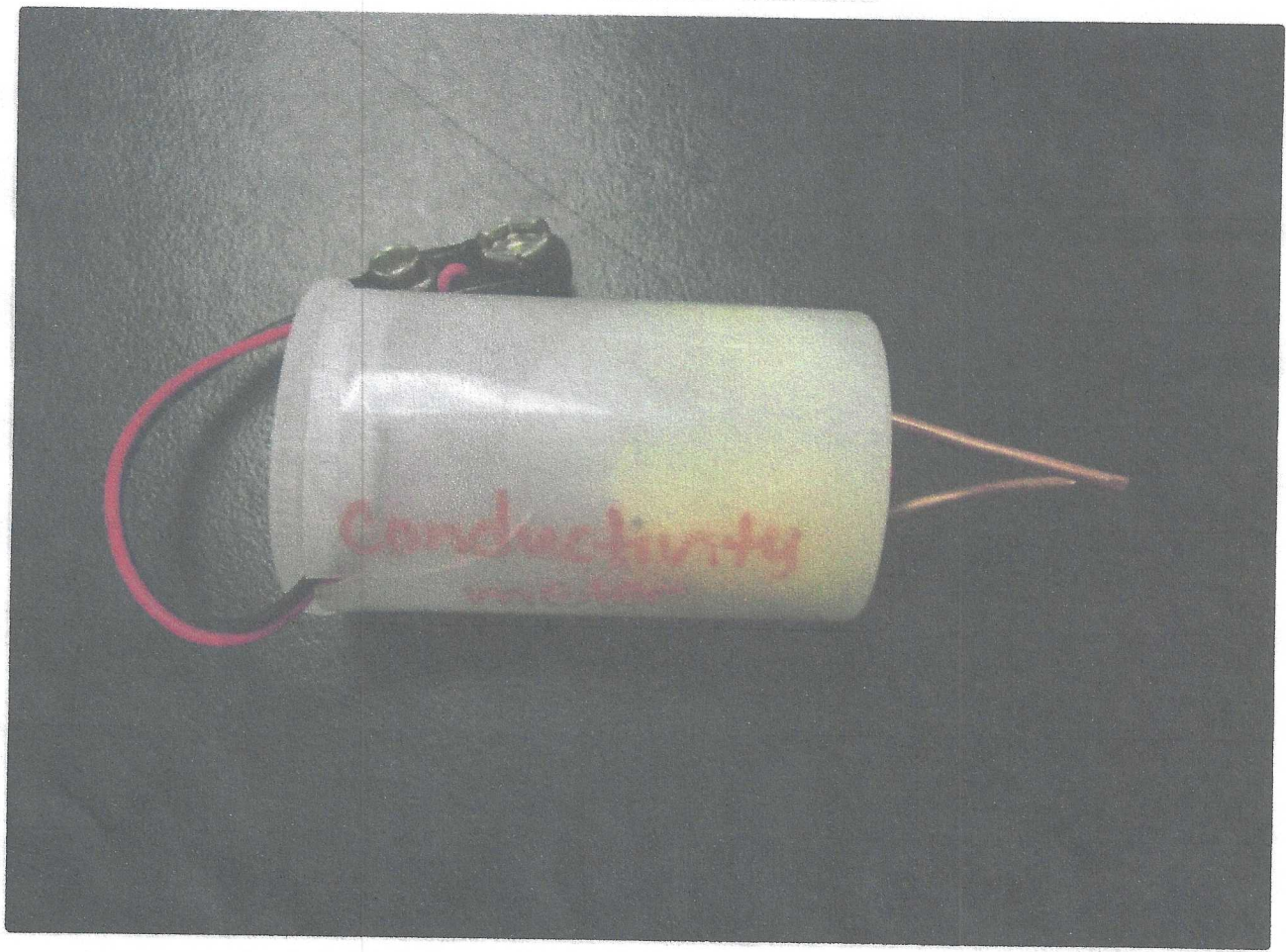




Conductivity Meter

By CitizenScientist (/member/CitizenScientist/) in Living (/living/) > Education (/living/education/projects/) 20,012 26

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(/member/CitizenScientist/) By **CitizenScientist** (/member/CitizenScientist/)

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About: I'm a physics and chemistry teacher at a public school in Maryland and active in my local science teacher's association. I love building things and am teaching myself how to use arduino in electronics projects... More About CitizenScientist » (/member/CitizenScientist/)

This instructable includes directions on how to make a simple conductivity meter. I use my meters with my chemistry classes to test the conductivity of different materials.

Materials

- plastic film canister
- drill
- LED and resistor

soldering iron and solder

stiff copper posts

9 V battery cap

9 V battery



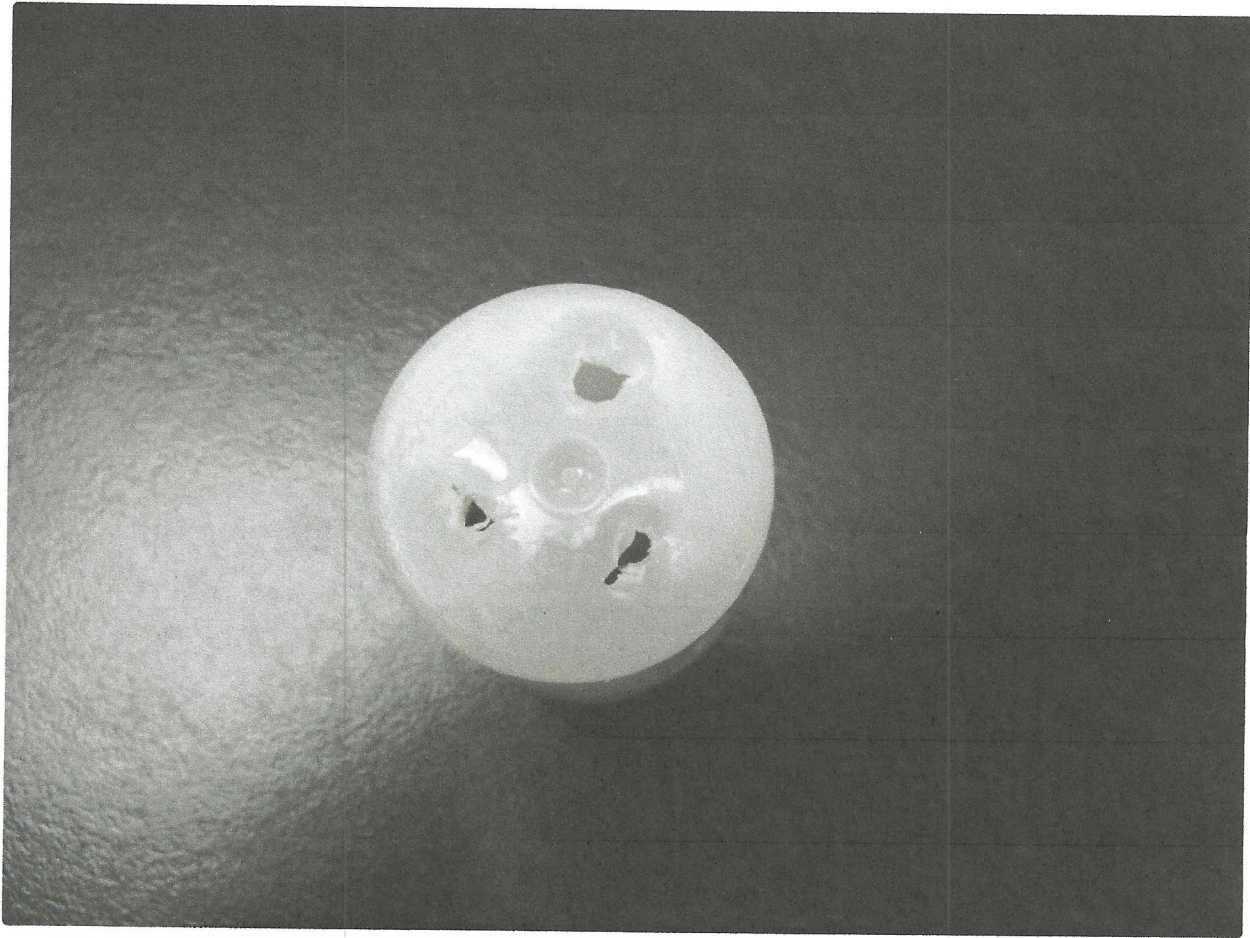
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Step 1: Preparing the Canister



I used a film canister for the outside housing to make the conductivity meter at least somewhat water resistance, and because I had several of them in the storeroom.

You need to make three small holes in the base of the canister through which you will stick the two probes (lengths of copper) and the glove of the LED. I used a small drill, you could also carefully poke through an ice pick or other small tool. Be careful not to make your holes too large, the fit needs to be snug.

I used a permanent marker to label the canister "conductivity meter" as well.



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Step 2: Assembling and Testing the Circuitry



Now assemble your circuit. Any visible light LED will work for this application just make sure you have the appropriate size resistor in series with your LED to protect the LED from bursting when you connect the battery.

Connect these components together in a line (not a closed loop):

one copper probe

resistor

LED

one end of the 9 V battery connector

then to the other end of the 9 V battery connector you solder on the second copper probe.

Before continuing, put a 9 V battery onto the connector and touch the two copper probes together to test the circuit. If the meter is working properly then the LED should remain lite while the copper probes are in contact.



Add Tip



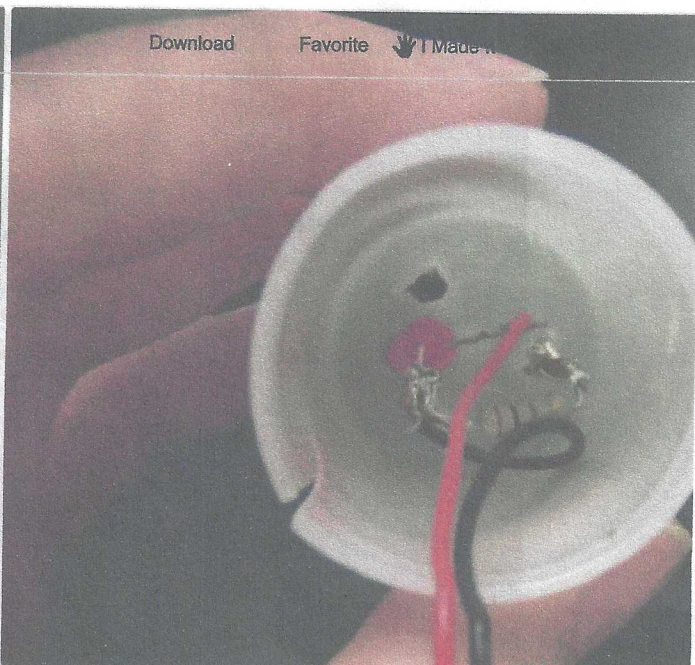
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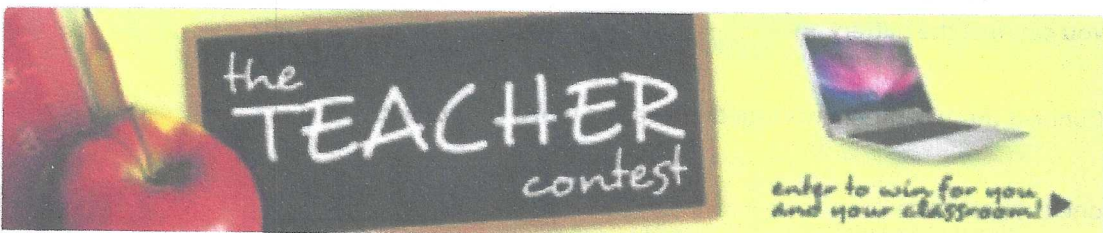
Step 3: Assembling the Meter



Now assemble your meter by inserting the probes through two of the holes in the bottom of the canister, and the LED through the third hole.

Let the wires to the 9 V battery cap come out of the canister at the top and use the cap to hold them in place. Add your battery and you are ready to start testing materials!

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SMART

Angler's Notebook

by Carl Richardson

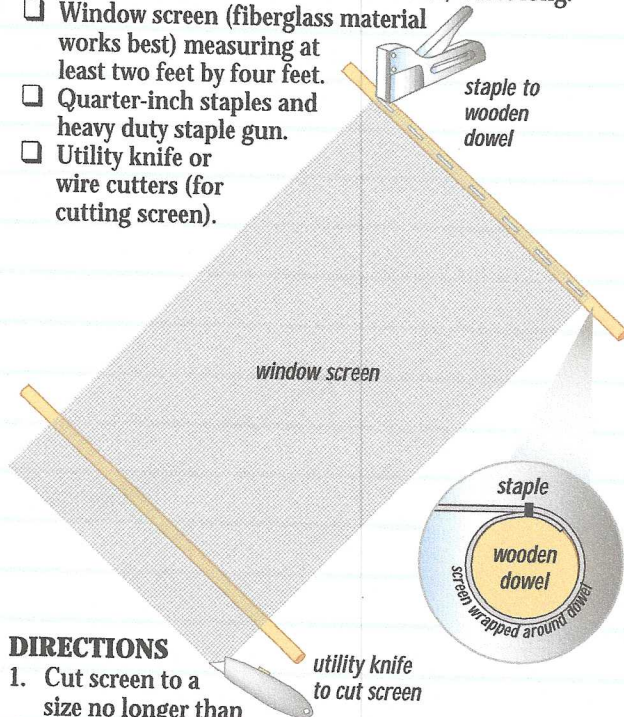
illustrated by Ted Walke

Critter Collectors

Kick Seine

Materials needed:

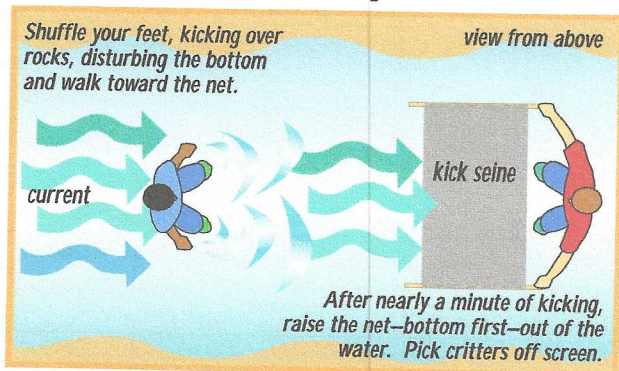
- Two wooden dowels, 1 inch diameter, 4 feet long.
- Window screen (fiberglass material works best) measuring at least two feet by four feet.
- Quarter-inch staples and heavy duty staple gun.
- Utility knife or wire cutters (for cutting screen).



DIRECTIONS

1. Cut screen to a size no longer than four feet. Fish and Boat Commission regulations limit the length of nets and seines to four feet. Seines larger than four feet require a special scientific collector permit.
2. Lay dowels along shorter edge of screen, lining up the bottom of screen with the bottom of dowels.
3. Wrap screen around dowel, one complete wrap. Staple screen to dowel rod, placing staples every six inches or so.
4. Repeat process on other dowel.

To use a kick seine: one or two persons



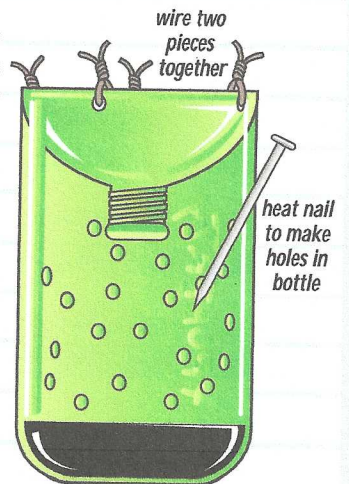
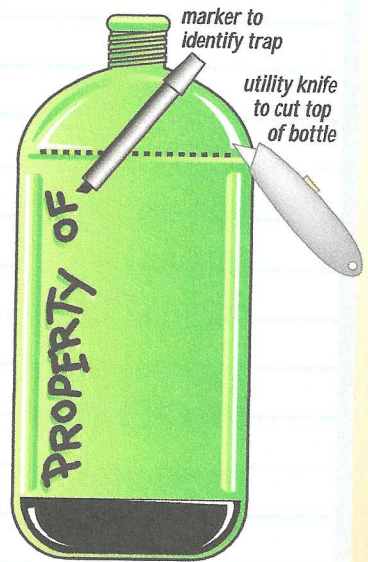
Soda Bottle Trap

Materials needed:

- Two- or three-liter soda bottle. Use bottles that have an opening of less than 1 inch. Regulations prohibit traps with larger openings.
- Picture frame hanging wire (or other suitable rigid 18-gauge or smaller wire).
- Large nail (10 penny or larger).
- Wire cutters.
- Utility knife.
- Permanent marker.

DIRECTIONS

1. Using the permanent marker, write your name, address and telephone number on the outside of the bottle. Pennsylvania fishing regulations require that unattended traps be identified with this information.
2. Cut the top from the bottle just where the bottle begins to taper toward the opening.
3. Invert the bottle top and place it inside of the remaining portion of the bottle.
4. Heat the nail and make four holes in the two pieces. The wires used to hold the two pieces together will go through these holes.
5. Cut four pieces of wire, each about two inches long.
6. Wire the two pieces together and cut off excess wire. Make sure to leave at least one piece longer. This will be the one you use to open the trap.
7. Heat the nail and make several holes in the body of the trap.



To use the soda bottle trap:

Place large metal washers or small stones inside the trap for weight. Traps are most effective when placed in shallows of ponds or lakes or the slower-moving portions of a river or stream. Trap can also be baited with bread. Be careful when using trap in early spring. Breeding or migrating salamanders may find their way into these traps. One salamander will attract others and soon you will have a bottle full of dead salamanders.

NOTE: Pennsylvania Fish and Boat Commission regulations limit the number of baitfish and/or aquatic invertebrates (fishbait) you can possess daily to 50.