Directions for Building the Conductivity Tester

Allow approximately 30 minutes to build and test each conductivity tester.

Procedure

1. Strip each of the wires attached to the battery snap connector so that approximately 2.5 cm (1 in) of wire is exposed. **Instructions for stripping a wire:** You will need wire strippers. Measure and mark a point 1 to 1.5 inches down on your piece of wire. Take your wire strippers and score a line all the way around the wire at the mark. Do not cut the actual wires. Take the wire strippers, and find the measurement marked on them for the size wire you're using for your project. Place the wire inside the wire strippers where the correct wire measurement is. Place it above the score line you made earlier. Gently pull up on the wire strippers to pull the coating off of the wire. Trim the wires, if needed, to make them all straight. Repeat Steps 1 through 5 if you accidentally cut through too far and damage the wires.
2. Insert one lead of the multimeter into the slot labeled COM on the multimeter. Insert the other lead into the slot marked mA. It does not matter which color lead goes into which slot.
3. Using one of the wires from the battery snap connector, twist the wire around the metal end of the lead inserted into the slot labeled COM. It does not matter which color wire is connected to which lead. Secure the wire to the lead using a small piece of electrical tape.
4. Attach the battery connector to the 9-volt battery by snapping it to the top of the battery. **NOTE: Do not allow the loose battery snap connector wire to touch the metal part of the lead inserted into the slot labeled mA.** This creates a circuit and could zap the multimeter or cause the battery to overheat. Also, do not touch the metal ends simultaneously. This also creates a circuit and could cause the holder to receive a small shock.
5. Turn the dial on the multimeter to the section labeled A or DCA. Set the dial to 200 m or 200 mA, depending on the labeling of your multimeter.

To test the conductivity tester

1. Make a saline solution using 1/8 teaspoon of salt and approximately 475 mL (2 cups) of water. Stir the solution until the salt is dissolved. If the salt does not completely dissolve, add more water.
2. Turn on the multimeter.
3. Remove plastic caps from meter leads before using. Slightly submerge the exposed wire from the battery snap connector and the lead inserted in the meter slot labeled mA in the saline solution. **NOTE: Do not allow the wire and meter lead to touch in the solution; keep them against opposite sides of the container.**
4. If the conductivity tester has been assembled correctly, the multimeter will register a current. **NOTE:** A set of replacement fuses should be purchased in advance of the activity since fuses may blow (often sold in 3-packs, inexpensively). Refer to the specifications sheet that comes with the meters for the correct fuse or take the meter to an electronics store.