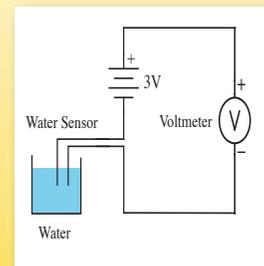
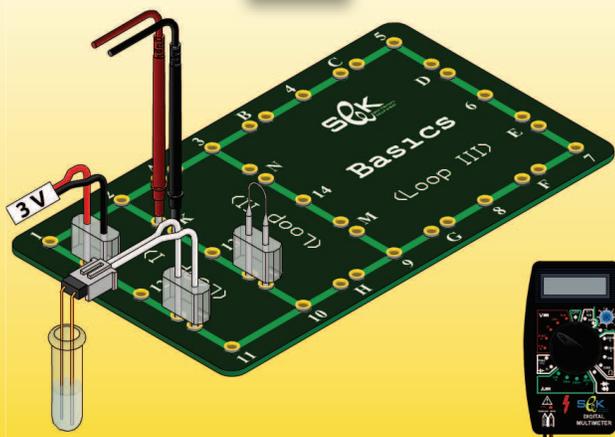


Experiment No. (8)

The Electrical Conductivity of Water & Solutions



Objectives:

1. The student will investigate the electrical conductivity of the water.
2. The student will investigate how water conductivity is dependent on its concentration of dissolved salts.
3. The student will investigate electrical conductivity of different solutions.

Apparatus:

- | | | | |
|------------------------------|-----------|----------------|---------|
| • Basics Board | • DMM | • Water Sensor | • Sugar |
| • Voltage Source (PSB Board) | • LED | • Test Tube | |
| • Connection Wire | • Jumpers | • Table Salt | |

Procedure and Conclusions:

1. Connect (3 volt) from PSB board to pair (J) using a connection wire in a way that the positive terminal (red wire) will be towards point (1); short pairs (I) and (L) with jumpers.
2. Turn the selection dial to the DMM to the DCV mode (range 20V), insert the DMM probes at the pair (K) and watch the DMM reading.
 - The voltage you measured is volt.
3. Insert the water sensor at pair (I) instead of the jumper.
4. Fill the test tube with tap water, immerse the probes of the water sensor deep enough in the water, watch the change in the DMM reading.
 - The current flows through at pair (I).
 - DMM reading indicates that tap water ... **conducts** / **doesn't conduct** ... electricity.

5. Insert LED at the pair (L) instead of the jumper in a way that the positive terminal will be towards point (13).



Notes:

- Ionic solutions are excellent conductors of electricity because there are many positive and negative ions in the solution.

6. Turn the selection dial of the DMM to DCA mode (range 20mA).
7. Again immerse the probes of the water sensor deep enough in the water, and watch the LED and DMM reading.
 - By immersing the probes of the conductivity Sensor in the water the LED ... emits / doesn't emit ... light
8. Dissolve some table salt in the water and watch the LED and DMM reading, add more salt to the water and stir the mixture, watch the changes.
 - By dissolving salt in the water, the LED ... emits / doesn't emit ... light, and the current flow in the circuit ...increases / decreases ..., this indicates that the dissolved salt ... increases / decreases ... the water electrical conductivity.
9. Fill the test tube with fresh tap water, rinse the water sensor probes in water and then dry it, add some sugar to the water in the test tube and stir the mixture, repeat step 7
 - By dissolving sugar in the water, the LED ... emits / doesn't emit ... light, and the current flow in the circuit ...increases / decreases / remains the same..., this indicates that the dissolved sugar ... changes / doesn't change ... the water electrical conductivity.



Discussion

1. Which conducts electricity more, Tap water or distilled water? Why?
2. Does the dissolved salt change the electrical conductivity of the water?
3. What do you think happen when the salt dissolved in the water?
4. Does the dissolved sugar change the electrical conductivity of the water?
5. Does the concentration of the dissolved salt change the electrical conductivity of the water?
6. Do you think that we can test the water purity by measuring the conductivity of water?