Module 10: Solutions
Topic 2 Application: Build a Conductivity Meter

The presence of an electrolyte can be determined and tested with a conductivity meter. In this application, you will be building your own conductivity meter to test the conductivity of different solutions. The more a solution conducts electricity, the brighter the light bulb glows. A solution which does not light up the light bulb at all does not conduct electricity and is called a nonelectrolyte. An example of a nonelectrolyte is sucrose, $C_{12}H_{22}O_{11}$. It does not form ions in water.

Before you begin, you will need to collect the following materials:

- 1 9-volt battery
- 3 small pieces of electrical wire
- 1 light bulb
- Electrical tape
- Sugar
- Salt
- Baking soda or baking powder
- Vinegar

In order to construct your conductivity meter, use the following steps:

1. Strip about one half of an inch of insulation from the ends of each wire.
2. Attach one end of Wire A to the positive terminal on the battery and the other end to the metal bump on the bottom of the light bulb. Make sure both connections secure with tape.
3. Attach one end of Wire B to the outside metal at the bottom of the bulb. Make sure the connection is secure with tape.
4. Connect one end of Wire C to the negative terminal on the battery. Make sure the connection is secure with tape.
5. Test the conductivity of each solution by placing one end of Wire B and Wire C in the mixture. If the material is electrically conductive, the bulb will light up. If the bulb does not light up, the solution is non-conductive.
6. Test the following solutions: One cup of tap water
7. One cup of tap water with one tablespoon of dissolved sugar
8. One cup of water with one tablespoon of dissolved baking soda or baking powder
9. One cup of water with one tablespoon of vinegar
10. Take a digital picture of the conductivity meter as you test each solution.

On a separate document, respond to each of the following:

1. Classify each solution as an electrolyte or a nonelectrolyte based on its conductivity.
2. On the same document, rank the solutions from most to least conductive.

Before you begin, access the Conductivity Meter Checklist to make sure that you include all of the items required for full credit. If you need to use resources outside this course to complete this assignment, please submit a Works Cited document with your assignment submission. If you need assistance, visit the Developmental Module for information on citing any resources that your use.

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Once you have completed your conductivity meter and question responses, please submit your work to the dropbox.