

## 46.4: Procedures

### Warnings

- Please be careful with the knife and be aware at all times of its location.
- The metal strips can cut your hand, so be careful, even while wearing work gloves.
- Juice from produce may squirt, and can irritate the eyes.
- Safety goggles are recommended for this lab.

You will test a variety of produce items for electric current production.

1. Draw a table in which to list your produce items and record your data. **Do not fill in data until you have read the instructions for obtaining that data.**

Table 46.4.1: Data Table

Produce Item	Predicted (Yes or No)	Current (mA)

2. Choose 3 produce items to test, and list these items in your table. Be specific when you list the produce items; there are many varieties of apples.
3. For each piece of produce in your list, predict whether you think there will be any current produced. Record your predictions in your table.
4. Use the knife to make two small cuts about an inch apart, in the outer skin of your first produce item, one for each piece of metal. Insert the copper and zinc strips into the first produce item such that the flat sides are parallel to each other and about 1/3 of the metal strips are submerged inside the produce.



Figure 46.4.1: Fruit and Veggie Circuit construction

5. Turn on your multi-meter, and adjust the dial to measure in milliamps (mA). Attach the accompanying electrical leads (insulated wires) to the appropriate holes in the multi-meter, the ones that will allow you to measure milliamps. Each multi-meter is different.
6. Touch the metal probes at the ends of the electrical leads to the strips of metal, creating a series circuit; you may want to press the probes to the metal strips to ensure good contact. Record the peak current shown by the multi-meter; the reading may fluctuate. Note that a negative reading shows the direction electricity is flowing; it is not a negative amount of current. If you have no reading, try wiggling the metal diodes and make sure the metal ends of the multi-meter leads are in full contact with the metal strips.

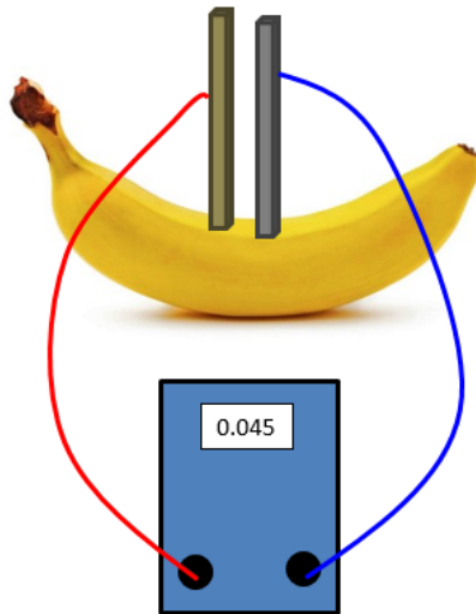


Figure 46.4.2: Measuring current in a Fruit and Veggie circuit

7. Remove the metal strips from your first piece of produce and thoroughly rinse the metal strips before you insert them into your next produce item. Also rinse the paring knife prior to using it for the next produce item. Set your tested produce item aside.
8. Test each of your produce items, recording the peak current for each. Remember to rinse the metal strips and the paring knife each time, prior to testing the next produce item.
9. Use the pH test strips to determine the pH of each produce item. Squeeze some juice from your produce item onto the multi-colored end of a pH test strip or insert the multi-colored end into one of the holes made by the metal strips. The test strip will react immediately upon contact. Match the colors on the strip to the color guide on the box. Record the pH values in your data table.
10. List your data on the board, excluding your predictions.

### Contributors and Attributions

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