

Hot Salsa Lab Demo

Student Guide

Description:

In answer to the question “What happens when you eat spicy foods?”, develop a testable explanatory hypothesis, then design and conduct an experiment to test the hypothesis using the materials provided.

Goals:

1. Design and conduct a brief scientific experiment in class.
2. Consider the scientific method and hypothesis testing. Emphasize the following points:
 - a. Experiments do not *prove* anything.
 - b. “Negative” results are valuable.
 - c. Sample size affects experimental outcome.
 - d. Experimental controls are necessary.
 - e. Statistics aid data interpretation.
3. Review terms and approaches in scientific experimentation.
4. Get comfortable in class.

Materials:

Salsa (can be two types, mild and hot)

Spoons, Chips (or other serving instruments)

Thermometers

Graph Paper (for data collection/analysis)

Access to T-test Formula, Excel, or Stats Pkg

Procedure:

1. Brainstorm answers to the question: “What happens when you eat spicy foods and why?”
2. Consider the materials provided in class, and develop a testable explanatory hypothesis for one of the effects of spicy foods on the body.
3. Divide into small groups of 3-4 and design an experiment to test the hypothesis. Write down each step in the protocol for the experiment. Be very specific. Define and include experimental control groups. Also consider sample size (number of subjects in each experimental group).
4. Share experimental designs with the whole class. As a group, decide on a single design to use.
5. Conduct the experiment.
6. Collect data and perform statistical analysis to help interpret the results.
7. Consider whether the results support the hypothesis.
8. Consider potential negative results and their value in science.
9. Consider potential design flaws in the experiment, or experimental confounds.
10. Generate at least two new experimental questions generated by the results.
11. Check your personal understanding of terms used in class today. If you are confused about anything, see your instructor immediately for clarification.

Additional Reading:

- Kinraide, T.B., Denison, R.F. (2003) Strong Inference: The Way of Science. Amer Biol Teacher 65(6): 409-418.