

# Scientific Method and Scoville Units



## Science

### Overview

This lesson will challenge students to examine the concepts quantifying a sensory experience using scientific data.

### Time Needed

- 3 class periods

### Standards

SBO6. Obtain, evaluate, and communicate information to analyze the economic and ecological importance of plants in human society.

- a. Construct an explanation of how plants are used in different societies (agriculture, horticulture, industry, medicine, biotechnology).
- b. Develop a model to explain how plants impact the environment by providing diverse habitats for birds, insects, and other wildlife in ecosystems. (Clarification statement: Include urban environments and how plants mitigate flooding and heat island effects and create cleaner air and water.)
- c. Construct an argument based on evidence to explain the use and potential benefits of genetically modified plants through traditional and modern molecular techniques and investigate the bio-ethical issues related to genetic engineering of plants.

SAP3. Obtain, evaluate, and communicate information to explain the coordination of information processing in the endocrine and nervous systems.

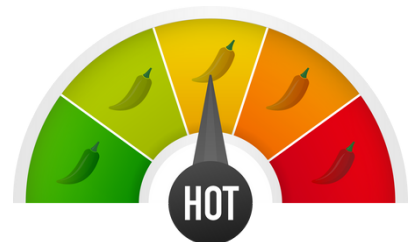
- a. Ask questions to investigate how the structures of the nervous system support the function of information processing (detection, interpretation, and response).
- b. Analyze and interpret data to explain how the hormones of the endocrine system regulate physical and chemical processes to maintain a stable internal environment. (Clarification statement: This should include positive and negative feedback mechanisms, e.g. heart rate, blood sugar, childbirth, temperature, growth, etc.)
- c. Ask questions about how the interdependence of the endocrine and nervous systems makes information processing (detection, interpretation and response) possible. (Clarification statement: Questions should address the homeostatic mechanisms, as well as the effects of and responses to aging, diseases, and disorders).

### Objectives

- Students will understand the science behind why peppers are spicy.
- Students will evaluate the current method of identifying spiciness.
- Students will brainstorm other ways to measure the spiciness of a pepper.
- Students will present their new method for measuring spiciness to the class and defend their research.

### Materials

- [Capsaicin Article: The Cool Science of Hot Peppers](#)
- [Scoville Scale Article](#)
- [Spicy Peppers Food Theory Video](#)
- [Scoville Scale Explained Video](#)
- [Idea for New Measurement Device](#)



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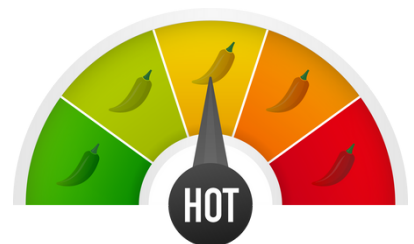
## Science

### Outline

- Engage: Students will read the article about capsaicin.
- Explore: Students will read articles to introduce them to the idea of using sensory evaluation to quantify data.
- Explain: Students will watch videos to build a basic understanding of the Scoville Scale and how spiciness is rated.
- Extend: Students will create a new way to quantify spiciness. They will design an experiment to test this hypothesis and have to defend their data.

### Lesson Plan

- Engage: Begin class with a variety of peppers either in person or pictures of a variety of peppers. Have students share their experiences with spicy peppers. How do they know which are hot? What ways did they taste them? How did they handle the spiciness? (This should be the Question part of the scientific process.)
- Explore: Let the students explore the article capsaicin in partnered reading and highlight the science behind the heat. They will also compare the Scoville article and look for links between both articles. (This should be the Research part of the scientific process.)
- Explain: Teacher will show the videos about why peppers are hot and how the Scoville Scale was created.
- Extend: Students will use this knowledge to brainstorm how they could create a better scale using their knowledge of science. (This should be the Hypothesis part of the scientific process.) Students could extend this further by designing their experiment and tracking their data. (This should be the Test with an Experiment part of the scientific process.)
- Evaluate: Students will present their ideas to the class and their classmates will question the validity of their ideas. (This should be the Analysis part of the scientific process.)



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