

LESSON 3 Ready For More Scientific Thinking? =====

Objectives

When students have completed this lesson, they will be able to:

- describe six parts of scientific thinking: recognizing patterns; making inferences; experimenting; comparing and controlling; avoiding biases; verifying;
- give examples of pattern recognition and of displaying biases;
- explain the importance of verification.

Exploring Science / Historical Steps

In this lesson, the layout is atypical. The topic of the Exploring Science / Historical Steps section (Jenner's discovery) merges so tightly with the lesson's topic (other aspects of scientific thinking) that the two are merged.

The Jenner story is used to lead students through some strategies that scientists use to solve problems: recognizing patterns; inferring; experimenting; comparing and controlling; avoiding biases; verifying.

There is some debate as to the details of the famous story of Jenner's first implementation of a vaccine, but there is wide acceptance of the basic fact that he used pus from a milkmaid to inoculate a child - with success.

Students will likely be familiar with the concept of controlled experimentation, so #4 should serve as a review of this important aspect of scientific thinking.

The concept of biases (#5) lends itself well to entertaining strategies. For example, you might show students old photos of people (perhaps of yourself) and have small groups briefly discuss whether they would hire the individual in the picture. You could then probe the class what biases seemed to enter into their decisions. Be prepared for the discussion to broaden into a discussion of prejudices.

Teachers should be alert to the fact that, in some families, biases play a significant role in discussions about vaccinations. Sadly, this topic became entwined in politics during the COVID-19 pandemic.

Verification might be introduced with an example of the possible outcomes of falsifying data.

To Do Yourself

If this has been used as a homework assignment, small group sharing would work well. If it has been an optional activity, you might invite brief "presentations" by those who participated.

Questions

1. Answers will vary.

Review

Please note: I have not made the answers available online, in the small chance that a student might discover them. Of course, the answers to these questions will be included in the version of the Teacher's Guide provided to teachers who purchase the text.