

THE SCIENCE OF FRINGE

EXPLORING: SCIENTIFIC INTUITION

A SCIENCE OLYMPIAD THEMED LESSON PLAN
SEASON 3 - EPISODE 8: **ENTRADA**

Overview:

Students will learn about scientific intuition and how it can facilitate the scientific method of collecting data through experimentation and observation in order to formulate and test a hypothesis.

Grade Level: 9–12

Episode Summary:

Peter discovers Bolivia's true identity, but she is able to escape before he can notify the rest of the team. As the Fringe team works to track her down, she contacts the alternate universe and arranges for a transfer back. Simultaneously on the other side, Broyles helps Olivia escape from Brandon's lab. They then work together to try to return Olivia back to our universe while being pursued by Walternate's agents.

Related Science Olympiad Event:

Experimental Design - Given a set of unknown objects, teams will design, conduct, analyze and write-up an experiment.

Learning Objectives:

Students will understand the following:

- Scientific intuition is the ability to quickly draw from experience to determine feasible solutions to a problem.
- When incorporated into the scientific method, intuition can often reduce the total time spent on a hypothesis.
- Intuitive abilities vary greatly from person to person and topic to topic.

Episode Scenes of Relevance:

- Peter briefing Walter and Broyles on Bolivia
- Astrid and Walter discovering a clue to Bolivia's whereabouts
- View the above scenes: <http://www.fox.com/fringe/fringe-science>

FOX CODE



FOR SMARTPHONES

Online Resources:

- Fringe “Entrada” full episode: <http://www.fox.com/watch/fringe>
- Science Olympiad Experimental Design event: http://soinc.org/exper_design_c
- Scientific Thinking and the Scientific Method: <http://www.freeinquiry.com/intro-to-sci.html>
- Scientific Methods, an online textbook: <http://emotionalcompetency.com/sci/booktoc.html>
- Using the Scientific Method: http://www.sciencemadesimple.com/scientific_method.html

Procedures:

1. Tell your students that they are going to learn about intuition and the scientific method.
2. Have your students research intuition and the scientific method in resources such as science textbooks and websites and discuss what they have learned.
3. Have your class complete the following activity:
 - a. Materials: bags / boxes of small edible items, such as animal crackers, jelly beans, cereal, etc
 - b. Hold a bag or box up for the class to see and give the students 30 seconds to observe the object and write down an estimate of the number of items it contains.
 - c. Create a histogram chart of the estimates for the bag / box from the entire class, as well as calculate the mean and median estimates.
 - d. Repeat this process for each of the bags / boxes available.
 - e. Have the class break into small groups, one per bag / box utilized, and open the bag / box and determine the actual number of items within.
4. Discuss with the class the results of the activity. Be sure to address:
 - a. How do the mean and median estimates compare to the actual number of items in each bag / box?
 - b. Did the accuracy of the group differ between the first bag / box and the last bag / box? Did seeing the histograms / means / medians impact subsequent estimates?
 - c. Did the groups utilize any special counting techniques based upon the estimates of the number of items present?

Additional Discussion Suggestions:

- Scientific intuition can often be utilized to narrow down the possible correct answers on multiple choice test questions. Discuss with the class examples of such questions and answers and what possible factors are triggering intuitive selection of the answers.
- Some edible items are packaged by weight, while others are packaged by item count. Does scientific intuition factor differently into a consumer’s perception of what the cost per individual item is in each of these situations?



Extension to Other Subjects:

Social Studies: Many jobs require the use of intuition in order to be performed safely and effectively. Examples include law enforcement, professional athletics, and critical health care. Discuss why these types of positions require good scientific intuition.

Art: A sense of aesthetics typically relies on experience and subconscious observations, which are also factors in scientific intuition. Many of these artistic factors have scientific foundations, such as complementary colors. Discuss other similar aesthetic factors and what scientific principles they are based on.

Psychology: Intuition is one of the psychological functions in the Myers-Briggs Type Indicator personality assessment. It is paired with sensing as an information-gathering function. Discuss the differences between these types and which ones the students would classify themselves as.

National Science Standards Alignment:

H.A.1 Abilities necessary to do scientific inquiry

- c. Use technology and mathematics to improve investigations and communications.
- d. Formulate and revise scientific explanations and models using logic and evidence.
- e. Recognize and analyze alternative explanations and models.
- f. Communicate and defend a scientific argument.