Lesson: Is it Real Science or Pseudoscience?

FOR THE TEACHER

Summary
In this lesson, students will deepen their knowledge of the scientific method by learning how to determine if researched information is valid and if it should be used for gaining or furthering our scientific knowledge. Students will view the documentary “Mermaids: The Body Found”, a pseudo-documentary that was later reported to be a hoax by the Discovery Channel. They will then use a “Baloney Detection Kit” to analyze the authenticity of information presented through different media as scientific fact.

Grade Level
High School

Objectives
By the end of this lesson, students should be able to
- Explain that not all published information is credible.
- Analyze information to determine what is credible versus what is not credible information.
- Write and defend a conclusion based on logical analysis of experimental data.
- Evaluate selected theories based on valid, supporting scientific evidence.
- Choose appropriate models to explain scientific knowledge or experimental results (e.g. objects, mathematical relationships, plans, schemes, examples, computer simulations)

Chemistry Topics
This lesson supports students’ understanding of
- Scientific Method
- Scientific Reasoning
- Analysis
- Observation

Time
Teacher Preparation: 15-20 minutes
Lesson: 1.5-2 hours

Materials
- Discovery Channel Documentary “Mermaids: The Body Found”
- Video 3-2-1 Analysis Graphic Organizer
- Internet Citation Organizer and Checklist
- Baloney Detection Kit Video

Teacher Notes
- The documentary can be found online here.
- Pseudoscience is a collection of beliefs or practices mistakenly regarded as being based on the scientific method. Be sure students understand the difference between it and science. Use examples to enforce this point. For example, refer to infomercials of products that have been proven ineffective. Also, astrology is considered a pseudoscience. Discuss why.
- Begin the video by first asking students if they believe mermaids exist. This is a great hook. Be sure to not let students know that the mermaid documentary was actually a hoax too early in the
lesson.

- Be sure to record names of “scientists,” “agencies,” and “theories” cited on the board to be used during the analysis of the video.
- Differentiation: Students at a higher level can investigate and show why an occurrence or study of their choice is pseudoscience or real and use the Baloney Detection Kit to do so.

**Procedure:**
1. Show the first 30 minutes of the documentary.
2. On Video 3-2-1 Analysis form, have students record three things they found out, two things they found interesting, and one question they have about the documentary.
3. Lead a class discussion about the documentary using the analysis form.
4. Review the “Carl Sagan Baloney Detection Kit” video and discuss the steps with the class. Afterwards, have students use the “kit” to analyze the documentary with an assigned group of four students. Assign a recorder to document all input.

**Analysis Question:**
- A discussion will be held to analyze our findings. Did the documentary prove to be real or pseudoscience according to the Carl Sagan Baloney Detection Kit?

**Conclusion**
- Students will write a paragraph explaining the differences and similarities between real science and pseudoscience. They will use the documentary as an example and support their stance on the documentary with three points from the Carl Sagan Baloney Detection Kit.

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**FOR THE STUDENT**

**Lesson**

**Is it Real Science or Pseudoscience?**

**Background**
We gain advances in science and technology based on passing along scientific knowledge acquired through the use of the scientific method. Scientific findings are published after experiments and observations, however, how do we know if we should rely on the information published? This lesson will help you to distinguish between good information and unreliable information.

**Pre-lab Questions**
List something that you have always wondered about the existence of, how it works, where it can be found, or how our lives benefit from its existence. This can be something that you question from TV or a movie, something a friend or family member told you or something you saw. How can you find out the answer to your question?

**Objective**
In this lesson, you will investigate how to determine if information gained through media research is valid and credible in furthering our knowledge of scientific phenomena (how the world works).

**Procedure**
1. Watch the first 30 minutes of the documentary.
2. On Video 3-2-1 Analysis form, record three things you found out, two things you found interesting, and one question you have about the documentary.
3. Discuss your observations with the class (after discussing with your group).
4. Review the “Carl Sagan Baloney Detection Kit” handout. Your teacher will discuss the steps with the class. Afterwards, use the “kit” to analyze the documentary you just watched with your assigned group. Have the recorder document your input.
5. Form a conclusion and justify your stance in a fully developed paragraph citing your references.