

# Sorting out Science Word Wall:

## A Nature of Science Activity

Based upon *Of Sunsets, Souls and Senses*

ENSI website: <http://www.indiana.edu/~ensiweb/>



**Aim:** To ascertain students' understanding of the nature of science. This activity is best conducted early in a unit on the Nature of Science and can be part of an ongoing conversation about the role and limits of science in society.

**Objective:** Students will showcase their personal understanding of "science" by sorting various phrases into groups based upon students' ideas about science in society. This is a formative activity intended to assess student's prior understanding of science.

### **TEKS: Biology**

(a) Introduction.

(2) Science is a way of learning about the natural world. Students should know how science has built a vast body of changing and increasing knowledge described by physical, mathematical, and conceptual models, and also should know that **science may not answer all questions**.

(c) Knowledge and skills.

(3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions.

The student is expected to:

- (A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;
- (C) evaluate the impact of research on scientific thought, society, and the environment

### **Procedure:**

**Engage:** Students receive a stack of cards with phrases on them. The cards are randomly sorted so that some phrases describe the nature of science and others describe common misconceptions about the nature of science. Phrases that describe science may include: observable, verifiable, measurable, open to change, and so on. Phrases that do not describe science may include: certain, a collection of facts, based upon proof. (See attached list for additional phrase recommendations.)

**Explore:** Students are invited to use their desk as a "word wall" and sort the cards into one of three categories:

"Science is..."

"Science is not..."

Not Sure

**Explain:** Students go out and scout ideas from one other student in the classroom. The scout team should see how their word wall matches or does not match with the second students' word wall. The student team can discuss reasons why they made their word wall decisions.

A whole group discussion can follow the scout team and may include student descriptions of their word wall, why they made their sorting decisions, and how their decisions were like or unlike another student's decisions.

**Extension:** Students and teacher can have current examples of science and science-related issues (ethical issues, political issues) in the media to discuss. The question is, "Is it science...?"

Science is...

Science is not...

Limited to the natural world

Decided by debate or law

Testable

Certain

Measurable

Fair

Made stronger by different lines of evidence

A search for truth

A search for understanding

Based on belief

Observable

Based upon proof

Repeatable

Democratic

Verifiable

Able to solve most problems

Open to change

A collection of facts

Based upon The Scientific Method

This is a non-comprehensive list. Additional phrases can be added.

## Science is about asking questions.

A 5 E lesson to support critical thinking about the nature of science

Science is about asking questions, but not all questions can be answered with science methods. This activity will help you to distinguish between “scientific” questions and questions that are better answered through other modes of thinking.

ENGAGE – to be completed by each student, individually

Read each question. Then, decide if the question can be answered by using science methods. Circle “yes” if we can use science to answer the question, “no” if the question cannot be answered by science, or “maybe” if you are not sure.

Next, consider the level of importance the question has to life, culture, or society. Circle “5” if you think that finding an answer to the question is very important. Circle “1” if you think that the question is not important at all. A “3” is an average level of importance.

	Question	Can science answer?	How important? 5 = very important 1 = not important at all
1	Does listening to classical music raise the IQ of infants?	Yes    Maybe    No	5   4   3   2   1
2	Is it fair that Americans consume more energy per capita than residents of third world countries?	Yes    Maybe    No	5   4   3   2   1
3	Does exposure to violence in video games increase violent behavior in children?	Yes    Maybe    No	5   4   3   2   1
4	Is there life after death?	Yes    Maybe    No	5   4   3   2   1
5	Did the planetary arrangements at my birth determine some of my life experiences?	Yes    Maybe    No	5   4   3   2   1
6	How effective are helmets for preventing injury when riding a bicycle?	Yes    Maybe    No	5   4   3   2   1
7	Will a more fuel efficient vehicle moderate the effects of global warming?	Yes    Maybe    No	5   4   3   2   1
8	Why is the sky blue?	Yes    Maybe    No	5   4   3   2   1
9	Will my boyfriend/girlfriend love me forever?	Yes    Maybe    No	5   4   3   2   1
10	Is the diversity of life on earth evidence of intelligent design?	Yes    Maybe    No	5   4   3   2   1