

Environmental Science: Earth's Place in the Universe



Essential Understanding:

- **Astronomy and planetary exploration of the solar system's structure, scale, and change over time**
- **Earth-based and space-based astronomy: structure, scale, and changes in stars, galaxies, and the universe over time**



“The brain weighs only three pounds, yet is the most complex object in the solar system.” -Michio Kaku

Overview

Students examine the processes governing the formation, evolution, and workings of the solar system and universe. Some concepts studied are fundamental to science, such as understanding how the matter of our world formed during the Big Bang and within the cores of stars. Others concepts are practical, such as understanding how short-term changes in the behavior of our sun directly affect humans. Engineering and technology play a large role here in obtaining and analyzing the data that support the theories of the formation of the solar system and universe. The crosscutting concepts of patterns, scale, proportion, and quantity, energy and matter, and stability and change are called out as organizing concepts for these disciplinary core ideas. In the Students are expected to demonstrate proficiency in developing and using models, using mathematical and computational thinking, constructing explanations and designing solutions, engaging in argument, and obtaining, evaluating and communicating information; and to use these practices to demonstrate understanding of the core ideas.

(<https://www.nextgenscience.org/sites/default/files/HS%20ESS%20DCI%20combined%206.13.13.pdf>)

Guiding question : What are the predictable patterns caused by Earth's movement in the solar system?

Individual work

_____ Read Study Guide (08/28)

_____ Participate in the lessons:

- Astronomy and planetary exploration (08/31)
- Big Bang, Changes in stars, galaxies, and the universe over time (09/14)

_____ Reflect on the answer to Guiding Question 1 (10/02)

_____ Make vocabulary cards for the vocabulary in your Vocabulary List (as needed, vocabulary card will not be allowed on quizzes or tests) (08/28)

Group work/ Lab Work

Labs will be done in groups of 4 or 5.

Lab Handouts: There will be a pre-lab for students to complete before the lab experiment, during the lab the students will gather the necessary data to complete the lab and answer the questions associated with the topic. After the necessary data is collected students will work on completing their lab notebook.

Lab Notebook: Every student is required to keep a lab notebook. The lab notebook will be each student's personal "copy". **You will receive specific instructions on the lab notebook requirements.**

This notebook will be graded on proper usage and completeness. *The lab notebook will be checked once a unit on the day of the assessment.*

Formal Laboratory Report: Each quarter students will put together a formally written laboratory report. This laboratory report is done individually (plagiarism is not allowed). The report must be typed and include; Title, Purpose, Procedure, Materials, Observations, Data, Results, Conclusion and Citations.

How do I put it altogether?

_____ Big Bang Socratic Seminar (09/21)

_____ Review for your self-assessment (09/28)

_____ Group project: Choose one of the following options (09/18)

- a. Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy that eventually reaches Earth in the form of radiation.
- b. Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe.
- c. Use mathematical or computational representations to predict the motion of orbiting objects in the solar system.

due date: (10/02)

Assessment

1. Vocabulary: Provide definition/picture/or both to illustrate meaning of vocabulary word. A sentence must be written using the vocabulary word.(10/02)
2. Testing your Knowledge: Self Assessment (10/05)

NOTE: Work will not be graded if you do not have a notebook that is only used for biology. Please do not use your biology notebook for another class, and make sure you come prepared with a pen/pencil.