Chemistry: A

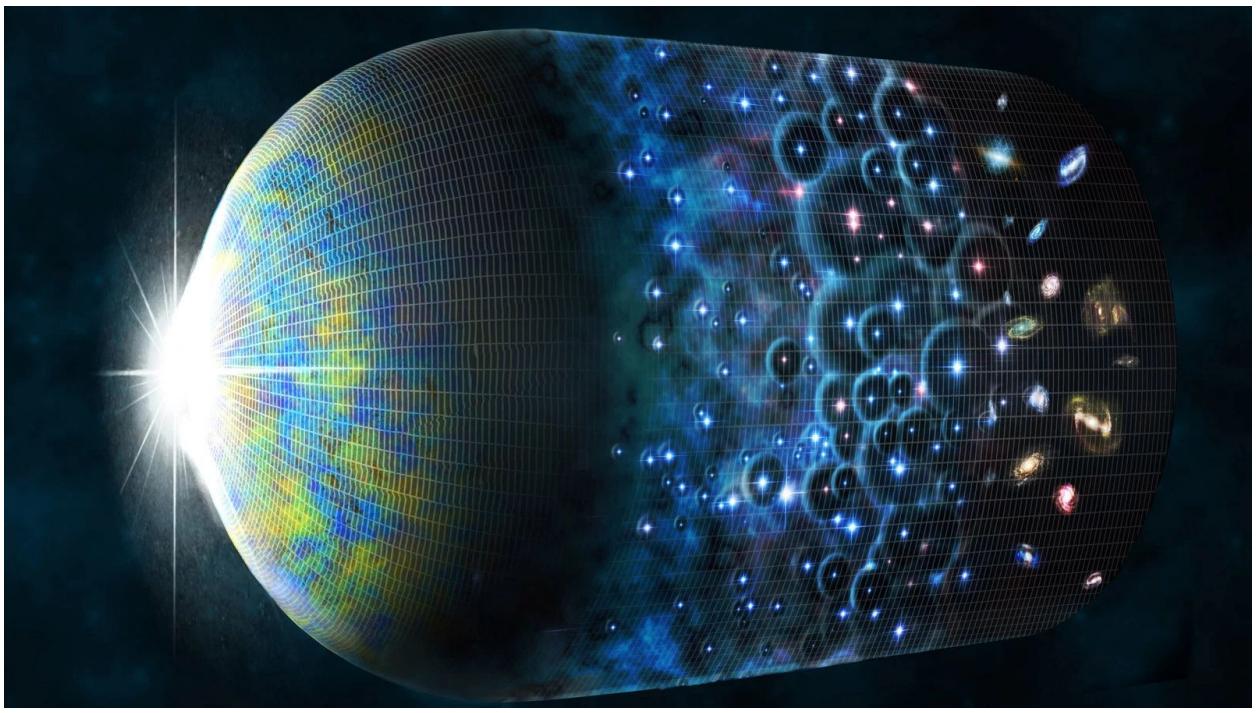
The Stepping Stones of Science

Essential understanding:

HS-ESS2-5. Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.

HS-PS4-4 Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.

HS-PS2-6. Communicate scientific and technical information about why the molecular level structure is important in the functioning of designed materials.



“Chemistry is, well technically, chemistry is the study of matter. But I prefer to see it as the study of change.” - Walter White

***Due Dates are subject to change in the first quarter of the school year. Please check the study guide regularly - the teacher will also notify students.**

Overview

Chemistry is defined as a branch of science that deals with the identification of the substances that compose matter; the investigation of their properties and the ways in which they interact, combine, and change. There 5 genres a chemist can be classified, Organic, Analytical, Inorganic, Biochemical, Physical. You will have a chance to see each one of these genres throughout the year. All genres deal with matter: a physical substances that occupies space and possesses mass. Everything you see in life consists of some type of matter. You will become a scientist in this course and use your human curiosity and questioning to answer questions about the world around you. Furthermore, students will investigate and be able to answer how students would deal with an oceanic oil spill. Additionally, begin understanding the chemical and physical properties of matter such as a metal fence appearing to disintegrate as it rusts. WELCOME TO CHEMISTRY!

You will need 2 Chemistry notebooks:

- **Lab Notebook**
- **Work Notebook**

*Each notebook **must** be brought to class everyday. Work will only be accepted in these two notebooks. It is strongly recommended you keep your notebook in the bins in class.*

Lab Work

Labs will be done in assigned 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.

Week 0 (8/22)

_ Introduction to class
_ Study Guide
_Class Contract
_Safety Contract

Individual work (All Weeks)

_ Participation/Classroom expectations
_ Daily Question of the Day Journal: from Projector/google classroom as you walk in to class.

Guiding Question 1: What is Matter and why do we care?

Week 1 (8/26)

Lessons

_ Chemistry Contract + Parent Conference

_ Lab Safety Protocols

_ Setting up Lab Notebook

Group Work

Due: Monday, August 26 and Tuesday, August 27

_"Chem is Try": Introduction to the process of scientific investigation found on **Google Classroom**.

Individual work

_ Chemistry Contract
_ Participation/Classroom expectations **(All Weeks)**
_ Daily Question of the Day Journal: from Projector/google classroom as you walk in to class. **(All Weeks)**

Week 2 (9/2) (no school monday)

Lessons

_ Sig Figs rules

_ Accuracy vs. Precision

_ Percent Error

Group Work

Due: Thursday, September 5 and Friday, September 6

_ **Popcorn Lab:** Sig Figs. Identify a procedure to determine how many kernels are in the jar. **See Lab Work description at the top of Study Guide and on Google Classroom**. Due by the end of class.

Individual work

Due: Monday, September 9 and Tuesday, September 10

_ Sig Fig practice
_ Metric Unit conversion/Scientific notation review
_ Participation/Classroom expectations
_ Daily Question of the Day Journal: from Projector/google classroom as you walk in to class.

Week 3 (9/9)

Lessons

_ State of Matter - Supplementary information

_ Density

Group Work

Due: Thursday, September 12 and Friday, September 13

_ Lab Equipment Sort: Introduction to types of equipment used by chemists and familiarizing with naming schemes

_ State of matter Jigsaw: student driven lesson to illustrate how matter exists in the real world.

Due: Thursday, September 12 and Friday, September 13

_ Determination of sugar in soda using density lab: **See Lab Work description at the top of Study Guide and on Google Classroom**.

Individual work

Due: Monday, September 16 and Tuesday, September 17

_ Classification of Matter: Intro to what Matter is and it is organized into subsets

/→ Concept Map: Graphic organizer of matter.

_ Participation/Classroom expectations
_ Daily Question of the Day Journal: from Projector/google classroom as you walk in to class.

Week 4 (9/16)

Lessons

_ Physical vs Chemical - Intensive vs Extensive

Group Work

Due: Thursday, September 19 and Friday, September 20

Research Lab: Determine the following physical properties and separation methods

Research methods to how to separate mixtures. Pick one from 1-4 and do #5.

- 1)salt water
- 2)sugar water
- 3)sand/water
- 4)sand/salt/water
- 5) Discover your own mixture

Students will determine the parameters of the experiment and what materials/equipment to use. Then students will compare methods and discuss/defend if disagreements arise. **See Lab Work description at the top of Study Guide and on Google Classroom**.

Individual work (All Weeks)

_ Participation/Classroom expectations
_ Daily Question of the Day Journal: from Projector/google classroom as you walk in to class.

Assessment: Due at the end of Unit ~ 9/23, 9/24

Propose Your Own Project:

- Propose a research question. All research questions must be approved by Mr. Muerle.

  Choose from the following topics:

  - Physical or chemical properties
  - Choose one of the standards from **Essential Understanding** and propose a question that you can investigate.
    - **HS-ESS2-5:** Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.
    - **HS-PS4-4:** Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.
    - **HS-PS2-6:** Communicate scientific and technical information about why the molecular level structure is important in the functioning of designed materials.

***Examples**:

1. How does the freezing of water produce potholes?
2. Does the ocean affect the air temperature above its surface relative to air over land?
3. What factors affect the rate of erosion?

Readings

Supplemental Reading: Primary research literature will be posted on

Google classroom.

Feel free to show me any interesting readings that I can share with the class :D

Links

All Links and Assignments are on Google Classroom under the corresponding topic list.