Chemistry Summer Assignment

The learning of chemistry requires a set of very important learning skills. This summer assignment will cover these skills by exploring a series of different science related themes. I will note what Skills you are practicing for each Theme. **Each one of the assignments is due on the First Day of School. Please make sure you have a digital copy of all your work, so that you can upload it to the classroom on the FIRST DAY OF CLASS.**

Each assignment is about 30- 45 minutes long so you should have plenty of time during the summer to complete them.

If you have any problems then email me at **ccarambo@philasd.org** for help. Challenge yourselves and start your sophomore year off right by completing all of these assignments on time. Following is a list of the themes and the skills that they teach.

Theme One: The Nature of Science: You will read three articles and answer analysis questions.
Skills: Reading and Analyzing Scientific Texts, Summarizing, and Citing Evidence

Theme Two: Chemistry in Our Lives: You will read and annotate two articles and answer analysis questions.
Skills: Close Reading, Annotating, Analyzing and Summarizing Text

Theme Three: Research: Element Webquest : You will complete a webquest on an element.
Skills: Research and Informative Writing

CLOSE READING:

An important learning skill is reading scientific literature. Each of the assignments will have some form of reading as part of it. When you read you should always make sure to underline / or highlight all vocabulary words you don't know and look them up. Some of the articles may have certain important science words highlighted and referenced for you. Whenever you read a science text make sure that you know the meaning of all words in the text. If you don't then use a dictionary or a reference website.

You should also begin to write notes about what you read. This strategy is called "annotating text" where you write questions or summary ideas in the margins as you read. We will practice **annotation** when we do the Close Reading or the articles on *Climate Change* and the *Periodic Table*, but it is a good idea to always annotate whenever you read.

There are **Three Themes** to this summer assignment. Each theme has several parts so you should pay close attention to the instructions. Each theme focuses on specific science learning skills.

On the following pages you will find detailed instructions for each theme. You should write your work on a computer so that it is neatly organized and legible. If you cannot do so then make sure to write neatly on (preferably college ruled) paper. Make sure to keep your work organized and neat. **All work is due on the first day of school.**

(Note: there are many links to websites throughout this assignment. I have provided the URL to all websites on the assignment. If a link is inactive, then cut and paste the URL into your browser.)

THEME ONE: The Nature of Science:

SKILLS:

- **SUMMARIZING**
- **CITING EVIDENCE**
- **ANALYZING TEXT**

Science is defined as both a body of knowledge about the natural world AND a specific set of practices that are used to investigate our world. **The first assignment covers the NATURE OF SCIENCE and SCIENTIFIC METHODS.** You will read three articles and answer questions about each of them.

First Article: Understanding Science Overview

Read the article: **Understanding Science: An Overview**

(URL: https://undsci.berkeley.edu/article/intro_01

You will need to read the first nine webpages. The answers to the following questions are in the reading. Make sure to write in complete sentences: do not copy and paste from the reading.

1. What are the two ways that science is defined?
2. How is science different from other ways of learning?
3. Why do you think science is important?
4. Why is science useful or important to the world?
5. Describe two ways that science is important in your life.
6. What are the seven important characteristics of science? (Explain each characteristic in your own words) These are the components of the Science Checklist that you will use to analyze the two articles that follow.

Applying the Science Checklist:

Following are two articles that explore different ways of learning about planets and stars. One explains what astrology does, the other explains how we study variable stars.

(IMPORTANT SKILL: CITING EVIDENCE FROM A TEXT).

You should find evidence in the readings to support your analysis. You should use details from the article as evidence to support each one of the science checklist characteristics. For example: If you think that astrology **studies the natural world** then you should use details from the article to support that opinion. If you think the study of variable stars **uses testable ideas,** then provide evidence from the article. **Remember every characteristic from the checklist that you include in your writing must be supported by evidence from the article.** Each article contains the checklist to make your analysis more efficient.

Click on the link to read the articles and apply the science checklist.

First Article: Astrology: Is it Scientific?

(URL: https://undsci.berkeley.edu/images/astrology_checklist.pdf

Second Article : Studying Variable Stars
(URL: https://undsci.berkeley.edu/images/checklist_leavitt.pdf

Summary Paragraph: Which of the two articles was scientific? Astrology or the variable stars research? Select the article that you feel is scientific and explain your reasoning using evidence from the characteristics on the science checklist. You should use at least five characteristics from the science checklist in your summary.

THEME TWO: CHEMISTRY IN OUR LIVES

SKILLS:

- **CLOSE READING**
- **ANNOTATING TEXT**
- **ANALYZING TEXT**
- **SUMMARIZING TEXT**

CLOSE READ

Below Are the Instructions on How to Do A Close Read. You should follow the instructions below to annotate your reading of the following two articles.

"COW POWER: A CLIMATE CHANGE SOLUTION" and
"THE PERIODIC TABLE TURNS 150"

Close Read

Read with a pencil/highlighter in hand and annotate the text.

• Annotating *means* underlining or highlighting key words and phrases—anything that strikes you as surprising or important, or that raises questions.

• Annotating *includes* writing your thoughts and reactions in the margins next to what you have highlighted or underlined. These need to be rich comments. Rich comments might begin with the word, what or why or any of the phrases that could also be used to start your reflection statement.

• Highlight or circle words you don't know and look them up! Write down the definition in the margin next to the word.

• You should have at least four annotations and at least 2 highlighted vocabulary words per page

(Note: If you can print the text then write your annotations and vocabulary in the margins. If you cannot print the text, then you will have to write your annotations and vocabulary on a separate sheet of paper. Make sure to write the page number of the page where the annotations go.

Summary Statement Write a summary statement for each article. Your summary

should include the following:

The author and title.
The main idea of the article (what it was about).
List the main scientific ideas of the article. Make sure to define all new / unfamiliar science words in the article.)
List one new scientific idea you discovered.
List one scientific idea you would like to know more about.

Your summary should Include a **Personal Reflection Statement:**
The statement should state what you learned from the article and a personal reflection statement (how you felt about the reading. Some example starters for a reflection statement are listed below.

I noticed. . . I'd like to know. . .
I wonder. . . I realized. . .
I was reminded of. . . If I were. . .
I am surprised that. . . I am not sure. . .

FIRST ARTICLE: **COW POWER**:

Click on The Title to Access the Article. You May Read the Article Online, or You May Download and Print It.
Instructions:

- Read and Annotate the Article
- Then Answer the Comprehension Questions and Write the Summary Statement.

COW POWER:
(URL:
https://www.acs.org/content/acs/en/education/resources/highschool/chemmatters/past-issues/2019-2020/apri-2020/cow-power.html

COMPREHENSION QUESTIONS:

Directions: Use the article to answer the questions below. Remember to write in complete sentences with correct spelling and proper grammar.

1. How many biogas systems were in operation in the U.S. in 2017?
2. How much manure do the cows at Noblehurst Farms produce each day?
3. What is the approximate monthly reduction in carbon dioxide production by Noblehurst Farms after implementing a methane digester?
4. Which two industries account for 10% of the methane generated by human activities in the U.S.?
5. How much money does Noblehurst Farms save by using methane digesters?

6. How do cows contribute to the production of greenhouse gases?
7. Which elements combine to make methane?
8. Define global warming potential.
9. Aside from dairy farms, list three other potential sources of biogas.
10. What is enteric fermentation?

SECOND ARTICLE: Periodic Table Turns 150.

Click on The Title to Access the Article. You May Read the Article Online, or You May Download and Print It.
Instructions:

- Read and Annotate the Article
- Then Answer the Comprehension Questions and Write the Summary Statement. (Follow the same instructions for the summary and reflections statement as you did for the "*Cow Power"* article.)

PERIODIC TABLE TURNS 150
URL:
https://www.acs.org/content/dam/acsorg/education/resources/highschool/chemmatters/issues/2018-2019/february-2019/periodic-table-150.pdf

Comprehension Questions

1. What was Dmitri Mendeleev's dream that reportedly was the start of his periodic table?
2. What is periodicity?
3. How did (a) Antoine Lavoisier, (b) Johann Döbereiner, and (c) John Newlands attempt to organize the elements?
4. What is a hydride, and (b) how did Mendeleev use hydrides in developing his table? 5. What was Mendeleev's most insightful decision in organizing his early periodic table, and (b) why?
6. What revision to Mendeleev's original periodic table did he make in 1871? 7. How did Henry Moseley change the periodic table in 1913 to its modern form? 8. Why is the placement of hydrogen on the periodic table a debate for some scientists? 9. Although the elements in the lanthanide and actinide series sit below the main table, where do they really belong?
10. Explain (a) Seaborg's "island of stability" concept, and (b) how it involves the nucleus of the atom.

THEME THREE: INDEPENDENT RESEARCH: ELEMENT WEBQUEST

To determine your element: Write your birthdate in the following form: Month (2 digits), Day, and Year (4 digits) then add them up. For example, June 12, 2015 is 06/12/2015 = 26. This is the element Fe #26 on the Periodic Table.
Use the number from your birthdate to determine which element you will research. Use the websites on the WebQuest to research your element. Then use the information to write an essay on your element as described below.

ELEMENT PROJECT INFORMATION:

Use the websites on the Webquest to research your element.

• Name: What Is The Meaning Of The Name of your element?
• History: Who Discovered It? When Was it discovered? And How It Was First Isolated? • Brief Biography Of Scientist Who First discovered the element
• What are the Physical and Chemical Properties of your element?
• Where is it found on the earth? In what form is it found?
• Is it useful in its natural form or must it be isolated or processed for our use? Explain. • What Is The Major Use Of This Element In Our Society?
• What is the atomic structure of the element (number of protons, neutrons, and electrons) • Does the element have any naturally occurring isotopes? *

- An isotope is an atom of the same element with a different number of neutrons, but the same number of protons.

Format for Your Writing
• Write All of The Information in Clear Well Constructed Sentences And Paragraphs. • Write an Introduction and at least three body paragraphs.
• Include a bibliography that cites the Websites you use for your project.

ELEMENT PROJECT WEBQUEST:

Use any of the following websites for information on your element. Remember to note the websites you use. You will need the information for your bibliography. The first three links are periodic tables: Click on an element for its properties, its history, and major uses. The periodic table at ptable.com is interactive. When you click on your element, a box opens on the left: click on the element's name for information. On the chemicool and eduction jlab sites you simply click on the element's name for information.

- https://ptable.com/
- https://www.chemicool.com/
- https://education.jlab.org/itselemental/ :

Use the following site for historical information. Click on an element for historical information. Also includes information on the element's isotopes. Hover over on an element for the meaning of its name and the scientist who discovered it. Click on the element for more detailed information on its uses and its history.

- http://www.rsc.org/periodic-table/history

Have a great summer. Remember to email me at ccarambo@philasd.org if you have any questions.