

## Summer Assignment for AP Chemistry (Parts I and II)

Teacher: Dr. Bennett

SFP

### Summer Assignment Part I: Matter, Math and the Metric System

Part I of your summer assignment is to:

- (a) Write definitions for the key terms in the *matter and its origins* unit of the online textbook *Chemistry the Science in Context*. This vocabulary list will be included in (and graded as part of) your portfolio for the first quarter and should be mostly a review of terms you have seen in previous science courses.
- (b) Review the metric system of measurements i.e. the SI units (and common prefixes) for mass, volume, distance, temperature, and energy. Prepare a brief 1-2 page summary that you can keep in your portfolio.
- (c) Complete the tutorials on significant figures, scientific notation, dimensional analysis and temperature conversions. View these chapter one tutorials on the website listed below.

<http://www.wwnorton.com/college/chemistry/gilbert2/>

Write summary notes, for each of these four tutorials, that are complete and concise (1-2 pages each). Be sure to include worked examples. These summary notes are to be included in (and graded as part of) your portfolio for the first quarter.

## **Summer Assignment Part II: Visit the American Museum of Natural History**

*(In Search of Gems, Gold, and Other Cool Stuff)*

**Prior to your museum visit**, discuss the following questions with your parents and grandparents and then complete the form.

Do certain gemstones or precious metals have a special importance in your culture?

What is your birthstone? What is the birthstone of one of your family members?

Is there a piece of jewelry in your family that has an interesting story behind it?

Did you or your parents ever live near a mine at any time in your life?

Do you remember what kind of mine it was?

**Review the following terms prior to visiting the museum:**

Element

Ionic compound

Crystal and crystal structure

Metal

Alloy

## **Museum displays to visit and required activities**

- Guggenheim Hall of Minerals and Morgan Memorial Hall of Gems (including video)
- Gottesman Hall of Meteorites (including the video)
- Rose Gallery exhibit of the Willamette meteorite
- Hall of Planet Earth (in particular the Effusive Volcanism and Explosive Volcanism displays and videos)
- Grand Gallery – recent acquisitions displays – stibnite crystal

**Activities and required work to hand in after the museum visit** - As you visit the above exhibits, complete the **scavenger hunt** and gather information and photos for your **elements project**. Be sure to **document** your visit with ticket stubs and, photos. It may be fun to visit the museum with a friend but remember each student must do their own work and submit their own unique project. You must also hand in the **questionnaire** you completed with your family prior to your visit.

**Think about It!** As you visit the exhibits you will find information on the chemical composition of the various ionic compounds, network solids, metals and metal alloys on display. Why do you think some elements are found in pure form in the earth while many other elements are found in the earth only as compounds with other elements?

**What were your favorites?** Use your camera or cell phone to take pictures of your favorite three exhibits. Be sure to write some notes to help you remember and identify these exhibits.

### **Elements Project:**

At the Hall of Minerals in the museum, you will search for examples of minerals that include your assigned element. Take pictures and notes, and use these in addition to further research to create a 8 ½ x 11 inch poster about your assigned element. The finished work should be slipped into a clear plastic sheet protector .

The poster will include the name of the element, its square from the periodic table (including chemical symbol, atomic number, atomic mass, and electron configuration), uses and applications, common sources, names and pictures of minerals that contain this element. Some elements will exist in the native form, for example gold. If they do, you must include a picture of it. They should also include any interesting facts you can find about the element, such as origin of the name.

**Challenge-** Scavenger Hunt Activity (Answer the following questions)

1. The place of origin of many of the samples that you viewed today was listed next to the sample. Which sample traveled the farthest distance to get to the Museum of Natural History?
2. Which crystal structure did you find most interesting and why?
3. Give an example of an alloy that you saw today. What is it made of?
4. Why does man value gold so much?
5. What is the historical importance of gold in South America, in Africa and in North America?
6. Name at least three places where gold is mined today?
7. Were you able to find your birthstone today? What did you learn about it?
8. Name and state the chemical composition of your favorite colored gemstone?
9. What is its color and what causes this color?
10. Where is it found in the world?

### Elements Project

| Student | Atomic Number of Element | Symbol | Name of Element |
|---------|--------------------------|--------|-----------------|
|         | 3                        |        |                 |
|         | 11                       |        |                 |
|         | 19                       |        |                 |
|         | 37                       |        |                 |
|         | 55                       |        |                 |
|         | 4                        |        |                 |
|         | 12                       |        |                 |
|         | 20                       |        |                 |
|         | 56                       |        |                 |
|         | 88                       |        |                 |
|         | 22                       |        |                 |
|         | 40                       |        |                 |
|         | 23                       |        |                 |
|         | 24                       |        |                 |
|         | 25                       |        |                 |
|         | 26                       |        |                 |
|         | 27                       |        |                 |
|         | 28                       |        |                 |
|         | 78                       |        |                 |
|         | 29                       |        |                 |
|         | 47                       |        |                 |
|         | 79                       |        |                 |
|         | 30                       |        |                 |
|         | 80                       |        |                 |
|         | 5                        |        |                 |
|         | 13                       |        |                 |
|         | 6                        |        |                 |
|         | 14                       |        |                 |
|         | 50                       |        |                 |
|         | 82                       |        |                 |
|         | 7                        |        |                 |
|         | 15                       |        |                 |
|         | 16                       |        |                 |
|         | 9                        |        |                 |
|         | 34                       |        |                 |
|         | 17                       |        |                 |
|         | 86                       |        |                 |

## Some FAQs Regarding Summer Assignment

**Student Questions:** Hi. I wanted to know if your prefer our write ups on any of the parts to be double spaced and for our summary notes.. can it be in bullet form?

**My Answer:** Bullet points are fine for this assignment for the summary notes and double space is fine. Remember to include worked examples where appropriate.

**Student Questions:** For the definitions, do you care if they're typed or do you want them handwritten? Also for the summaries we have to do, should they be in paragraph form or can they be written in a note taking style? As for the questionnaire, can we do it on the paper? Sorry for all the questions, I just don't want to royally mess up on our first assignment. I'll be waiting your reply. Thanks in advance,

### **My Answers**

1. Definitions can be hand written on lined paper or typed but only after you've carefully read and understood the definitions given by your reference sources - please do not just copy and paste from a website as there is little value in that approach.

2. Summaries can be written in a note taking style and do not have to be written in paragraph form. Bullet points are fine. Please include worked examples of sample problems where needed.

3. The questionnaire can be done on the paper that was handed out and hand written is fine.

An electronic version of the assignment is posted on the school website (see scrolling summer assignments banner - click on it and follow the links) on the school's home page and on the science department resources page.

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### **Student Questions**

I have a few questions about the elements project for the summer assignment.

When you mean common sources, do you mean what areas have deposits of the element?

When we do the electron configuration for the elements, does that include the notation with boxes and arrows where the arrows represent the electrons?

Do we need references for the poster? Thank you. I hope you have a great summer.

**My Answers:** For common sources - I mean in which mineral deposits for example - We are interested in the details of the chemical composition of the mineral in which a particular element is found (and not in the geographic locations per say - although this would be an interesting extra piece of information to include).

For the electron configuration of your element - you can use the short hand notation for energy level, orbital type and number of electrons in the orbitals : ex  $1s^2 2s^2 2p^6$ ...etc ( remember that the numbers following the s, p, d, f orbital symbols signify the number of electrons and need to be superscripts - I can't do that in this e-mail; message).

References can be listed on the reverse side of your element poster. It is always good form to acknowledge reference sources. Have a good summer. See you in September. Dr. B.

### **Student Questions:**

I'm planning to go to the museum this week so I can finish my science summer assignment completely, but I realized I misplaced my original handout. I forgot that we were given specific elements and now I'm trying to remember what element I was given. I think I might have received Neon, but I'm not sure if my mind is just creating the memory. Do you mind telling me what element I have? I think we all wrote down the numbers on the sheet. Thank you in advance

### **My Answer**

The atomic number of your element was 30 (so not neon) . If you have already visited the museum and have done the work for neon then stick with that - please remind me of this e-mail correspondence when you turn it in - I will keep it in my AP folder of my e-mails but remind me all the same. See you in a few weeks. Dr. Bennett

### **Student Question**

I have just one question for the summer assignment: For the one to two page summaries, can we use charts and tables as opposed to text?

### **My Answer**

- that would be fine as long as they are summaries that you have constructed (i.e. not just copy and paste of tables found online) and as long as they include the main points. They can be hand written as well but must be done neatly and I have to be able to read your hand writing. See you in a few weeks. Dr. Bennett