

STEM Honors Chemistry Summer Assignment

Hello, our names are Mr. Nines and Ms. Morgan; we will be your algebra-2 and chemistry teachers. This year, our classes will be investigating the content relationships between these subjects as well as other scientific endeavors. We are excited to get you into the laboratories (at Great Mills High, Patuxent River Naval Base, and other off-school sites) collecting data and analyzing what it all means! Being an independent learner will promote your success in our classes. To get you started, you are expected to learn/complete the assignments below. The information you are responsible for will be used frequently throughout your STEM career. We are excited and anxious to meet you.

1. Memorize element names and symbols for elements with the following atomic numbers (spelling counts as does proper use of upper and lower case letters):

- Atomic numbers 1-40, 42, 46-48, 50-57, 74, 78-89, 92, 94

I suggest creating flashcards with the name on one side, symbol on the other. Please DO NOT memorize any atomic numbers or atomic masses. You can quiz yourself (which we strongly recommend) using electronic flashcards at

<http://education.jlab.org/elementflashcards/index.html> (choose all available, chemical names and symbols. DO NOT choose atomic numbers! Use proper capitalization), <http://education.jlab.org/elementmatching/index.html> or visit Proton Don @ <http://fun.funbrain.com/periodic/index.html>

2. Refresh your memory (memorize if you do not know them) of the main prefixes used in the Metric System. Know how to convert from one unit to another (<http://dbhs.wvusd.k12.ca.us/webdocs/Metric/Metric.html> might be helpful).

| | | | |
|-----------|---|------|----------------|
| Kilo | K | 1000 | 1 km = 1000 m |
| Hecto | H | 100 | 1 Hm = 100 m |
| Deka | D | 10 | 1 Dm = 10 m |
| Base Unit | | | |
| Deci | D | .1 | 1 dm = 0.1 m |
| Centi | C | .01 | 1 cm = 0.01 m |
| Milli | M | .001 | 1 mm = 0.001 m |

3. a. You are required to complete a science or engineering fair project for potential entry in the County Science Fair. Please consider your project carefully AFTER reading all Intel International Science and Engineering Fair rules. The regulations you must read are located at www.sciserv.org/isef/students/rules_regulations.asp. When you get to the website, scroll down to "Rules Index." At a minimum, you are required to read the following links...

- [Intel ISEF Category Descriptions](#)
- [Display and Safety Regulations](#)
- [Eligibility - Requirements - Limitations](#)

*Please note the most common cause for project disqualification is addressed under “Approval and Documentation” item number 7 (which is actually the first item under this category). If your project falls into one of these categories, DO NOT BEGIN EXPERIMENTATION. An IRB and SRC board will be available for approval of your proposal by late October.

**You do not need to read the Team Project section, as there will be no team entries for this class.

- [Roles and Responsibilities of Students and Adults](#)
- [Human Subjects](#)
- [Vertebrate Animals](#)
- [Potentially Hazardous Biological Agents](#)
- [Hazardous Chemicals, Activities or Devices](#)
- [SRC and IRB Review Boards](#)

You may want to peruse the section at the top of this sciserv page “International Rules and Guidelines FAQ” where they provide answers to questions commonly received on their e-mail account.

b. I strongly suggest you think about/look for different science fair ideas (you are not required to have your topic until October). Here are some suggested websites to use as springboards for thinking. Please keep in mind, you are a STEM student and your scientific endeavor must include a well-designed project, technology, and data that incorporates mathematics. Identify a topic that is interesting to you and explore it to a deeper understanding. If you do begin researching your project over the summer, please record all information in a bound composition notebook.

<http://chemistry.about.com>

http://www.sciencebuddies.org/mentoring/project_guide_index.shtml

<http://www.eskimo.com/~billb/amasci.html>

<http://amasci.com/weird.html>

<http://sciencemadesimple.com/science.html>

<http://youth.net/nsrc/sci/sci.001.html>

<http://www.awesomelibrary.org/science.html>

<http://www.school.discovery.com/sciencefaircentral>

4. a. Download and print a copy of a periodic table from the Internet. Don’t worry; there are a lot out there, but if you need me to specify try <http://www.chemicool.com/> Ensure the table you choose has at least the element symbols displayed in a modern periodic table orientation (the way you have seen it in any science class you have had). Memorize the following:

b. Use color-coding to indicate the following on your periodic table:

- | | |
|------------------------|-----------------------------|
| i. Alkali metals | viii. Alkaline earth metals |
| ii. Nitrogen family | ix. Inner Transition |
| iii. Transition metals | x. Halogens |

- iv. Lanthanide Series
- v. Noble Gases
- vi. Metals
- vii. Nonmetals
- xi. Actinide Series
- xii. Metalloids/Semi-Metals

Bring your completed summer assignment to class the first day; there will be a quiz on items #1,2,and 4.