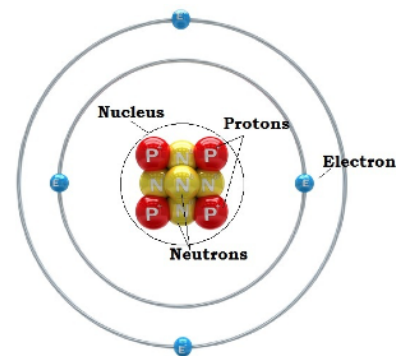
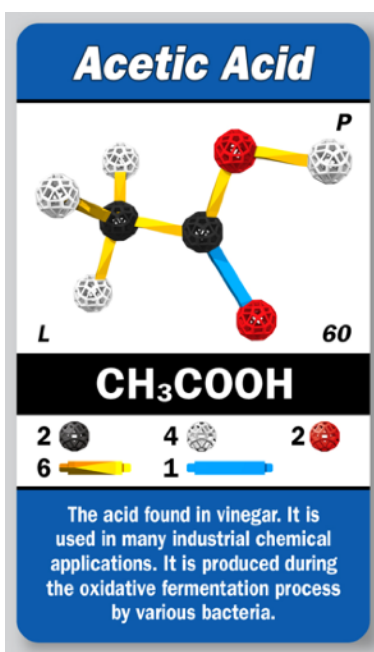




**Nanoscience at OSA**  
**2023-2024**  
**Instructor: Dr. Steve Yoshinaga**  
**Thursdays 9 - 10:30 am**  
**In-person class with labs**



This science series is designed to engage middle school students in the joys of chemistry and biology. The course will review 5th - 8th grade California chemistry and biology standards in a fun and interactive way that is bound to leave students with a lifelong appreciation of the sciences. The class will reveal insights and connections with real life as chemistry and biology is all around us and within us. Most students who take this class will look forward to high school science. This series of 32 molecular science classes include the following sessions: Shapes of Nature, Chemistry "R" Us Part 1, Chemistry "R" Us Part 2, and the Biological World. The classes in this series are equal parts lectures, videos, hands-on experiments, and discussion. Limited to 14 middle school-aged students.



**Materials Needed:**

Home computer and/or internet access (such as at a public library); one spiral notebook, with pockets, for notes, handouts, completed problems and independent assignments.

**Expectations:**

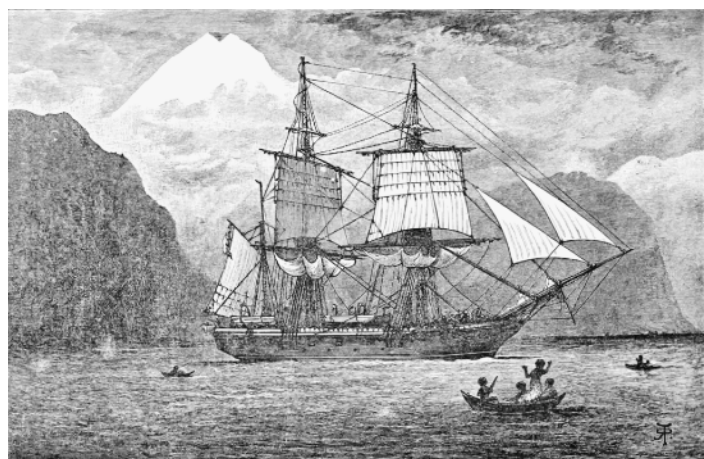
Students are expected to be quietly attentive during presentations and videos. Note taking is encouraged. During group and individual activities, the student is expected to listen carefully to instructions before engaging in the activity. Links to

instructional videos will be provided for home activities.

**Syllabus:**

Each 1.5-hour class will consist of direct instruction, group, and independent activities. Classes will include lecture, videos, demonstrations, worksheets, and hands-on activities.

There is an annual \$100 lab fee due at the beginning of the year.



***HMS Beagle: Find out why it is one of the most famous ships in history***



## **Tentative Schedule 2023-2024**

### **Session 1 - 7 weeks      Shapes of Nature**

8/24	3-D Shapes and Tops
8/31	Magnetic Worlds and Molecules
9/7	The Molecule Game
9/14	Diamonds, Graphite, and Buckyballs
9/21	DNA Models
9/28	Viruses
10/5	Molecule Game Tourney

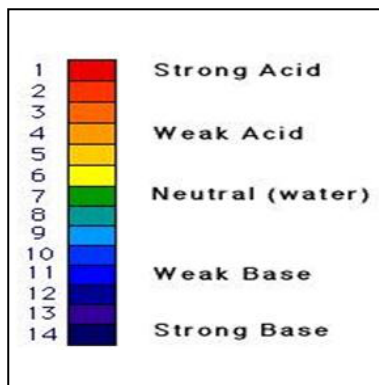


### **Session 2 - 8 weeks      Chemistry R Us Part 1**

10/19	Science and The Scientific Method
10/26	Chemistry and You
11/2	Protons, Neutrons, and Electrons, oh my!
11/9	Periodic Table of the Elements
11/16	In a State of Matter
11/30	Metals are Shiny
12/7	Chemical Reactions
12/14	Acids and Bases

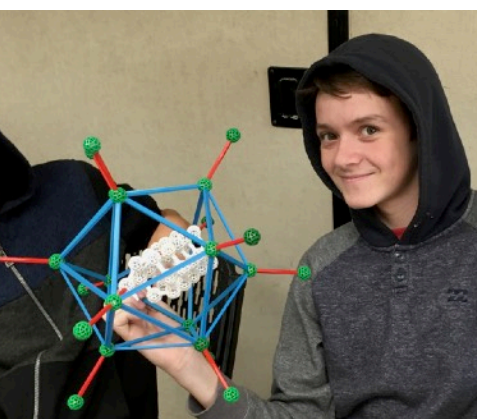
### **Session 3 - 9 weeks      Chem R Us Part 2**

1/11	It's a Gas
1/18	Crystals
1/25	Microscope Lab: Crystals
2/1	Light and the Electromagnetic Spectrum
2/8	Radioactivity: Alchemy R Us
2/15	Biotechnology Lab
2/22	Polymers R Us
2/29	Cycles on Planet Earth
3/7	Photosynthesis and Respiration



### **Session 4 - 8 weeks      Biological World**

3/21	The Cell
3/28	Central Dogma of Molecular Biology
4/18	Breaking the Genetic Code
4/25	DNA Extraction Lab
5/2	Genetics
5/9	The Molecular Biology Revolution
5/16	Symbiosis
5/23	Evolution



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