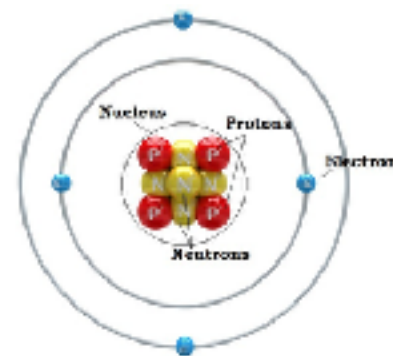




Middle School Molecular Science
Instructor: Dr. Steve Yoshinaga
Tuesdays 9 - 10:30 am



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 31 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 15 middle school-aged students.

Acetic Acid

CH₃COOH

2 4 2
6 1 2

The acid found in vinegar. It is used in many industrial chemical applications. It is produced during the oxidative fermentation process by various bacteria.

Materials Needed:

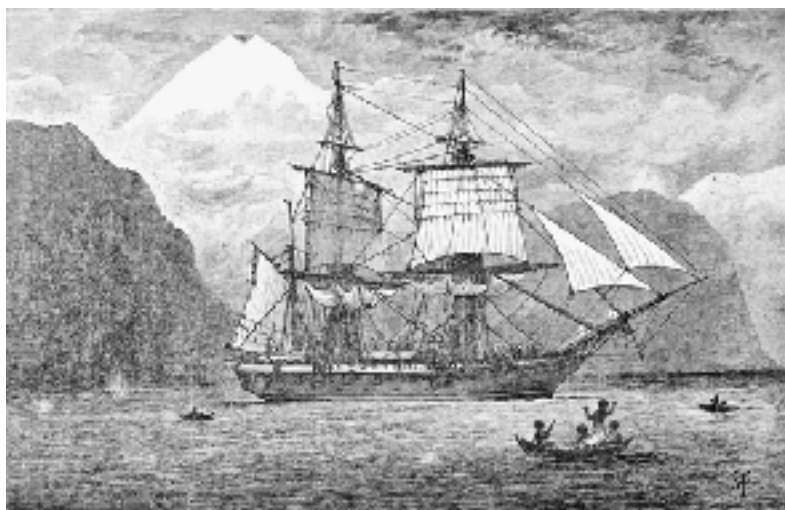
Home computer and/or internet access (such as at a public library); one spiral notebook, with pockets, for notes, handouts, completed problems and independent assignments.

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. It is expected that the student engage in online instructional videos as homework.





Tentative Schedule 2018-19

Session 1 - 9054-4181: Shapes of Nature \$120

- 8/28 3-D Shapes and Tops
- 9/4 Magnetic Worlds
- 9/11 Molecules
- 9/18 The Molecule Game
- 9/25 Diamonds, Graphite, and Buckyballs
- 10/2 DNA Models
- 10/9 Viruses

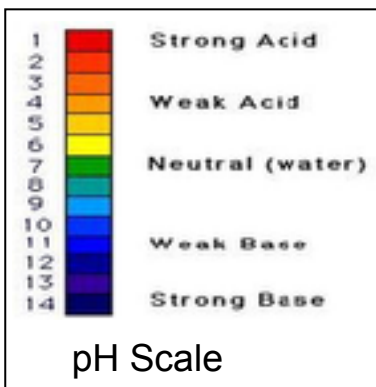


Session 2 - 9054.5181: Chemistry R Us Part 1 \$120

- 10/23 Chemistry and You
- 10/30 Protons, Neutrons, and Electrons, oh my!
- 11/6 Periodic Table of the Elements
- 11/13 In a State of Matter
- 11/27 Metals are Shiny
- 12/4 Chemical Reactions
- 12/11 Electrons and Electricity: Moving Electrons
- No class on Tuesday 12/18/18

Session 3 - 9054.1191: Chemistry R Us Part 2 \$160

- 1/15 Acids and Bases
- 1/22 pH Indicators
- 1/29 It's a Gas
- 2/5 Crystals
- 2/12 Light
- 2/19 The Electromagnetic Spectrum
- 2/26 Polymers R Us
- 3/5 Biochemistry: Photosynthesis
- 3/12 Planet Earth



Session 4 - 9054.2191: Our Biological World \$140

- 3/26 DNA to RNA to Protein
- 4/2 DNA Extraction Lab
- 4/9 Cells: The Basic Unit of Life
- 4/30 Microscope Lab
- 5/7 Genetics
- 5/14 Molecular Biology Revolution
- 5/21 Symbiosis
- 5/28 Evolution



Steve Yoshinaga, Ph.D.
steve@skybay.us 805-208-9523