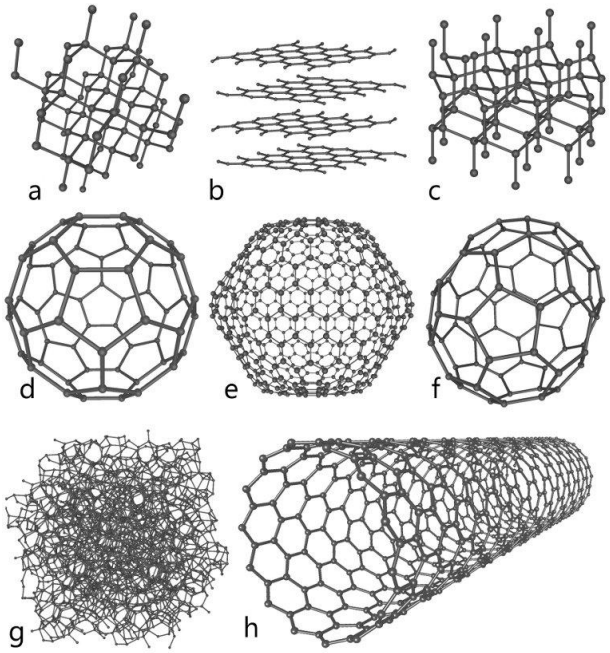
Chemistry: The Carbon Cycle
Youth Initiative High School
9th & 10th Grade
Teacher: Vicki Ramsay



> Life exists in the universe only because the carbon atom possesses certain exceptional properties.
>
> — **Sir James Jeans**
> *The Mysterious Universe* (1930), 8.

The foundation of our 9th grade exploration into the Carbon Cycle is David Mitchell's book, The Wonders of Waldorf Chemistry. With hands-on experiments for nearly every day of class, students will experience the phenomena of organic substances interacting. Experiments will include tests for sugar, starch & cellulose, studies of chlorophyll and carbohydrates, esters, plastics, rubber and hydrocarbons as well as investigations into the actions of photosynthesis, fermentation and distillation. Scientific observation is key, and students will be recording their observations and drawing conclusions about them. Throughout this exploration, they will try to keep in mind: Where does this occur in Nature? Where does this occur in the human being? Where does this occur in technology?

Says Mitchell, "Wonder is an experience which blossoms in the soul when one is suddenly surprised and amazed by the attentive consideration of something rare, astonishing, and extraordinary. When we feel wonder we feel enlivened through our own vitality and feel a direct connection with an archetypal spark in the Universe. Wonder is the seed of knowledge."

Students will be able to conceptualize the large scale carbon cycle by seeing processes at work like recycling, wastewater reclamation and biodiesel manufacturing. We will discuss human use of carbon in relationship to global climate change. Grading for the course will be based upon student attendance and participation in all class activities, and the student's level of observation and detail in lab reports, a main lesson book, two tests and a final project. This project is one in which students will construct their own 5-carbon model of a carbon compound of their choice.

A wonderful image released by Michael Ströck under the GNU Free Documentation License: The structures of eight allotropes of carbon:
a) Diamond b) Graphite c) Lonsdaleite d) C60 (Buckminsterfullerene) e) C540 Fullerene f) C70 Fullerene g) Amorphous carbon h) Single-walled carbon nanotube