

Introductory email to Chemistry 1315 section 1 Fall 2008

Dear Chemistry Explorers,

If you dream of designing new types of batteries to store solar energy and solve the energy crisis.... Or if you dream of curing disease with new antibiotics....Or if you would like to know what a greenhouse gas is before you vote on the next clean air bill....Or if you wonder why you add salt to the water you are boiling for cooking spaghetti.... then chem 1315 is the first step to achieving your dreams and answering your questions. Chemistry is the study of how energy and matter interact and change. Chemistry has applications in all fields of science, engineering, healthcare professions, and ordinary everyday activities like cooking and cleaning. Asking questions and solving problems are important skills for studying chemistry. Dr. Zare wrote about the importance of asking questions in a recent editorial for C&E News, the weekly journal of the American Chemical Society (see attached). I encourage you to explore, ask questions, and do lots of homework problems in chm1315.

I look forward to an exciting semester studying chemistry with you! The first class is Monday, so come prepared and bring a calculator and your clicker. In order to prepare for class on Monday:

1. Read the syllabus available at <https://webct.ou.edu/webct/public/home.pl>
2. Register your clicker. Instructions are attached and also available at <http://www.interwritelearning.com/support/tutorials/rfoverview.html>
3. Complete the introduction module of WebAssign, the new online homework system at <http://www.webassign.net/login.html>. Enrollment instructions are attached.
4. Review the attached lecture notes for unit 1. The lectures notes will be available on webct shortly.

We will begin Monday by reviewing the syllabus and how to use clickers and WebAssign, and then start with learning objective 1.1.

I invite you to my office hours, Monday and Friday at 10:30 am in Chemistry Building room 111, to ask questions and solve problems. See you Monday in class!

Sincerely, Susan Schroeder

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FROM THE EDITOR

The Power Of The Question

This guest editorial is by Richard N. Zare, the Marguerite Blake Wilbur Professor in Natural Science at Stanford University, who recently addressed the graduating members of Phi Beta Kappa at Stanford. The following editorial is derived from his address.

The question is a little-understood element of human cognition. Nevertheless, some question is at the center of every scientific and technological advance, and fundamental questions underlie every humanistic quest to comprehend the world about us. The question is a central aspect of both learning and knowledge creation.

Yet students often seem to value more the answer than the question. I think quite the opposite. The quest to answer a question is where the learning takes place, not the answer itself.

I feel so strongly about this matter that I have been involved in an activity called MOLECLUES, a play on the word MOLECULES, in which we invite students under the age of 18 to pose questions. The "we" refers to the [Molecular Frontiers Foundation](#), of which I am the president. The inaugural awards of the annual Molecular Frontiers Inquiry Prize for youth just took place on May 30 at the Royal Swedish Academy of Sciences, in Stockholm, which is also the home of the science Nobel Prizes. This competition, which some have nicknamed the "kid Nobel," is meant to foster inquisitiveness and creativity in young people around the world. It is open to anyone, from anywhere, so long as the participant is under 18 years of age.

Children as young as eight from all over the planet participated in the competition via the free science discussion Molecular Frontiers website where they could chat with young scientist mentors or their peers in an environment that was designed around our motto: "Curiosity – Creativity – Honesty – Knowledge."

The competition entrants, in addition to asking a short question related to molecular science, had to explain to the judges why they thought theirs was an important question, where they have already looked for the answer, why they were unsatisfied with the answers they received, and what they suggest scientists do to obtain better answers.

The winning entries sounded simple at first glance, yet quickly made for furrowed brows among the world-caliber scientist jury. For instance, Vladimir Leopards, age 15, asked, "Why aren't plants black?" Noting that black absorbs more sunlight than green, he wondered why haven't plants evolved to take advantage of this extra energy available for photosynthesis? Katie Osborn, age 14, asked, "What are emotions?" and described an experiment to check for a hereditary component to emotional responses that she hoped would explain why people constantly tell her that she "responds just like her mother."

Those are two of the 10 winning questions. The point is that questions propel the world of inquiry and you should never underestimate the power of a simple question in organizing human endeavors. When you ask a question, you develop ownership of the question, and this sense of ownership is nothing like what you get from an answer. Today, we are drowning in information. The real power comes from the question, which organizes knowledge and directs us to the unknown. Life is not about answers; it is about questions, and the quest to find solutions to stated problems.

We all begin at an early stage in life, often the age of three or four, by asking repeatedly "Why, why, why?"—meaning that we want to know why certain things are the way they are. Many parents find this annoying and tiresome and call this childish behavior—but I urge you to retain this childlike approach to learning. The right question at the right time can make all the difference as we stumble along the path of life. It is by questioning that we examine how well we really know something and discover what we still need to learn. It is an essential part of the joys of the life of the mind.

You can investigate the world of molecules at the Molecular Frontiers Foundation website, www.molecularfrontiers.org. Questions for the next round of the Inquiry Prize can be submitted at the website, and mentors are welcome to register.

Richard N. Zare, Stanford University

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