

**Education Seminar # 2: Lesson Preparation, Movie Sessions, NOS, Publication Funding, Proposal Writing and Misconceptions**

Speaker: Dr. John Breiner, Associate Professor of Chemistry, University of Cincinnati, University of Cincinnati

Date: June 30, 2011

Times: 9:00 AM – 12:00 Noon

Venue: University of Cincinnati, Old Chem. 615A

Prepared by:

Ms. Phyllis Hutchinson, Goshen High School, Ghosen, OH

Ms. Lindsey N. Burkhart, Pre-Service Teacher Student, College of Education, Criminal Justice, and Human Services, University of Cincinnati, OH

The second Educational seminar for the 2011 RET participants was presented by Dr. John Breiner. Dr. Breiner received his B.S. in Chemical Engineering as well as his PhD in Chemistry from the University of Cincinnati (UC) in Cincinnati, Ohio. Dr. Breiner started his career as an educator by becoming an adjunct professor at UC and other local colleges including Cincinnati State and St. Thomas Moore. Dr. Breiner earned a track position at the University College at UC where he first fell in love with teaching “at-risk” students. He refers to himself as a “STEMist” and is a firm believer in the saying, “Whether you believe you can or you can’t, you are right!” Dr. Breiner is now a tenured professor at UC and is currently teaching Chemistry 103 to incoming college freshman. He has also received a grant from the NSTA which will help students attending Hughes High School to successfully complete UC courses in order to become effective secondary science teachers. Some photos of the session are presented below.



**Dr. Breiner and the RET Participants During the Education Seminar on Misconceptions**

This educational seminar focused mainly on common misconceptions held by many secondary science teachers today as well as their students. Dr. Breiner also presented information which proved to be very helpful for lesson preparation, movie sessions, and journal entries. He engaged the RET participants by beginning the session with several interesting stories from his own teaching experiences which many of the educators could personally relate to. He also described many of the success stories in which he managed to change his students’ minds about math and science, and even got some of them interested in pursuing careers in these fields.

The next topic Dr. Breiner explained dealt with the many misconceptions that up to 80% of the population hold regarding widely known “facts.” To support his theory on these popular misconceptions, he had the RET participants anonymously complete a ten-minute “Quick Think” questionnaire in order to test their preconceived notions about certain science topics. The questionnaires were collected and the correct answers to these “simple” questions were reviewed and discussed. Most of the pre-service and in-service teachers were surprised to learn that they also held, and have even taught, some of these common misconceptions to their students. These questions included: What color is the blood in our veins? If a seed is planted and grows into a large tree over the next two decades where does its mass come from? What causes the different seasons on Earth?

To reassure the RET participants that even the most educated people have these common misconceptions; he showed a video of recent Harvard graduates and MIT students also answering these questions incorrectly (<http://www.learner.org/resources/series26.html?pop=yes&pid=77>). Dr. Breiner further emphasized these misconceptions by giving examples from his own teaching and classroom. He described how students would commonly mistake the three different phases of matter, the role of carbon dioxide in photosynthesis and how it is responsible for the mass of plants, the cause of a “real” working circuit, as well as how to correctly draw an atom.

Dr. Breiner dedicated the last hour of this session to helping the RET participants better understand the journal article that they are expected to write with the hopes of publication. He stressed the importance of including a safety session in the article as well as many other detailed instructions involving the submission method, guidelines, and number of words. This resulted in an open discussion of the concerns that the participants still had about the journal entry as well as the movie and the poster assignments. Dr. Breiner concluded his educational seminar with one-on-one interactions with the group members from each project.