

## **“NSTA Symposium: Doing Good Science” Friday, October 21, 2005**

**8:00 AM – 8:15 AM**

### **Registration**

**8:15 AM – 8:35 AM**

### **Welcome, Introductions, Goals for the Symposium**

Al Byers, Assistant Executive Director of Government Partnerships and e-Learning, NSTA

Claire Reinburg, Director NSTA Press, NSTA

Flavio Mendez, Symposia and Web Seminars Program Manager, NSTA

- About NSTA Symposia
- Agenda/Goals
- Forms/Credit Info/Logistics
- Introductions

Dr. Rick Vanosdall, Co-Author, *Doing Good Science*, Tennessee State University

Dr. Olaf Jorgenson, Co-Author, *Doing Good Science*, Hawaii Preparatory Academy

**8:35 AM – 9:10 AM**

### **Opening Activity: “Doing Good Science”**

#### **Learning Outcomes:**

- Participants will experience an activity from the book to introduce the context and content and describe the difference between “doing science” v. “learning about science”.
- Participants will explain the value of using mathematics within scientific inquiry.
- Participants will design and conduct a scientific investigation.
- Participants articulate elements of critical and logical thinking to make relationships between evidence and explanations.

**9:10 AM – 9:30 AM**

### **Overview of Symposium/Participant Requests**

#### **Outcome:**

- Participants will present specific questions, topics, ideas, issues, concerns, etc., they would like to have addressed in today's session. (Areas may include: the middle school student, *Doing Good Science* (book), inquiry/reform in an era of accountability and NCLB, content/pedagogy.)

Note: The presenters will try to accommodate participant requests during the session as time allows. The presenters may respond to requests via email or during one of two Web Seminars (November and February).

**9:30 AM – 10:00 AM**

### **Pedagogical Follow-up for the Opening Activity**

#### **Learning Outcomes:**

- Participants will describe the necessary elements for guiding and facilitating student learning through inquiry.
- Participants will develop a set of guidelines to support scientific discourse within and across classrooms.
- Participants will model the skills of scientific inquiry, as well as curiosity, openness to new ideas and data, and skepticism that characterize science.

**10:00 AM – 10:30 AM**

**Using Metaphors to Deepen Understanding**

**Learning Outcome:**

- Participants will identify and use a metaphor to explore and enhance their skills for facilitating school change and science education reform through inquiry-based teaching methods.

**10:30 AM – 10:45 AM**

**Break**

**10:45 AM – 11:15 AM**

**Expanding Our Understanding of “Doing Good Science”**

**Learning Outcomes:**

- Participants will use mathematics to quantify variation within a species. (A foundational concept in the life science standard.)
- Participants will experience an activity from the book to reinforce and enhance their understanding and application of scientific inquiry to classroom instruction.
- Participants will communicate scientific procedures and explanations.

**11:15 AM – 12:00 PM**

**Pedagogical Follow-up 2**

**Learning Outcomes:**

- Participants will define inquiry-based learning.
- Participants will identify necessary steps to initiate inquiry-based science instruction. (Subtle shifts.)
- Participants will explore effective methods for implementing science education reform within their classroom, school, district, and state.

**12:00 PM – 12:30 PM**

**Final Words**

- Post-assessment form
- Evaluation form/Survey
- NSTA Web Seminars
- Raffle of door prizes

**Standards Addressed:**

**Content Standards, 5-8**

**A. Unifying Concepts and Processes in Science:**

- Evidence, models, and explanation.
- Change, constancy, and measurement.

**B. Science as Inquiry**

- Design and conduct a scientific investigation.
- Develop descriptions, explanations, predictions, and models using evidence.
- Think critically and logically to make the relationships between evidence and explanations.
- Communicate scientific procedures and explanations.
- Use mathematics in all aspects of scientific inquiry.

#### **D. Life Science**

- Diversity and adaptations of organisms (Variation within species.)

#### **H. History and Nature of Science**

- Science as a human endeavor.
- Nature of science.

### **Teaching Standards**

#### **A. Teachers of science plan an inquiry-based science program for their students.**

- Select teaching and assessment strategies that support the development of student understanding and nurture a community of science learners.

#### **B. Teachers of science guide and facilitate learning.**

- Focus and support inquires while interacting with students.
- Orchestrate discourse among students about scientific ideas.
- Recognize and respond to student diversity and encourage all students to participate fully in science learning.
- Encourage and model the skills of scientific inquiry, as well as the curiosity, openness to new ideas and data, and skepticism that characterize science.

#### **D. Teachers of science design and manage learning environments that provide students with the time, space, and resources needed for learning science.**

- Create a setting for student work that is flexible and supportive of science inquiry.
- Ensure a safe working environment.

#### **E. Teachers of science develop communities of science learners that reflect the intellectual rigor of scientific inquiry and the attitudes and social values conducive to science learning.**

- Nurture collaboration among students.
- Structure and facilitate ongoing formal and informal discussion based on as share understanding of rules of scientific discourse.
- Model and emphasize the skills, attitudes, and values of scientific inquiry.

#### **F. Teachers of science actively participate in the ongoing planning and development of the school science program.**

- Plan and develop the school science program.
- Participate in decisions concerning the allocation of time and other resources to the science program.