

The ORAU Center for Science Education

Bringing Tomorrow's Science into Today's Classrooms

Examples of Science Education Classroom Activities



- Appalachian Regional Commission/Oak Ridge National Laboratory Math and Science Technology Summer Institute (www.orau.org/arc-ornl/)

- Spallation Neutron Source (SNS) to the Classroom Workshop



- Extreme Classroom Makeover (www.orau.org/center-for-science-education/classroom-makeover/)

- ACTS—Academies Creating Teacher Scientists



- Education Program Workshop of the International Conference for High Performance Computing

- Texas Instruments (TI)-Nspire and TI-Nspire Computer Algebra System (CAS) Hands-on Workshops



- High Performance Computing, Simulation and Visualization to the Classroom

- The Harnessed Atom Workshop for high school and middle school teachers

a high percentage of the U.S. science and technology workforce is nearing retirement age. With this in mind, there is growing concern about our ability to attract a sufficient number of U.S. students into the scientific and technical fields necessary for our nation to compete in a global economy. To address these specific needs, the ORAU Center for Science Education leverages partnerships with the U.S. Department of Energy, Oak Ridge National Laboratory (ORNL), and a number of federal agencies to bring tomorrow's science into today's classrooms by providing advanced technologies for education and connecting students and educators with laboratory scientists and research experiences.



Pictured L to R, back row: U.S. Department of Energy (DOE) Program Director Michele Branton and ORAU's Mike Wetzel look on as Linden Elementary School third grade students' (L to R, middle row) Esther Gallmeier, Aubree Schuck, Will Jeter and Ryan Ochiltree demonstrate their use of handheld microscopes to complete a scavenger hunt on a one dollar bill. DOE's Assistant Manager for Science Johnny Moore, far right, also receives instruction from one of the students. The demonstration was conducted in the ORAU Center for Science Education Classroom and allowed the students to record their findings using an interactive SMART board.

ORAU's Center for Science Education Classroom provides . . .

- **A connection**—between real science and classroom instruction
- **An education laboratory**—for experimenting, learning, demonstrating and showcasing results
- **A virtual learning environment**—including technology-based visualization, simulation and computer modeling to enhance the study of science, technology, engineering and mathematics (STEM)
- **A resource center**—featuring proven products, services and programs that can help make STEM educators more effective

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OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

ORISE is managed by ORAU for the U.S. Department of Energy

The ORAU Center for Science Education Classroom

The ORAU Center for Science Education features an advanced classroom that utilizes sophisticated technologies and creative classroom configurations to motivate and support the education of a new generation of students in the digital age.

New Technologies

Increasing our global competitiveness begins by providing teachers with the tools they need to inspire students. That's why the ORAU Center for Science Education Classroom is working to transform traditional instruction by utilizing the following new technologies to motivate and cultivate the next generation of scientists and engineers:

- Video wall of nine, 42-inch plasma screens with multi-video processing capabilities
- Document camera
- Interactive whiteboard
- Tablet PCs
- Student response or "clicker" systems to increase student participation
- Teacher station for control and integration of all technologies in the room
- Laptop computers and wireless connectivity
- Flexible room configuration
- Three breakout rooms for small group interaction
- Video conferencing and webcasting capabilities
- Digitally recorded presentations that are stored online for later use

New Ways of Learning

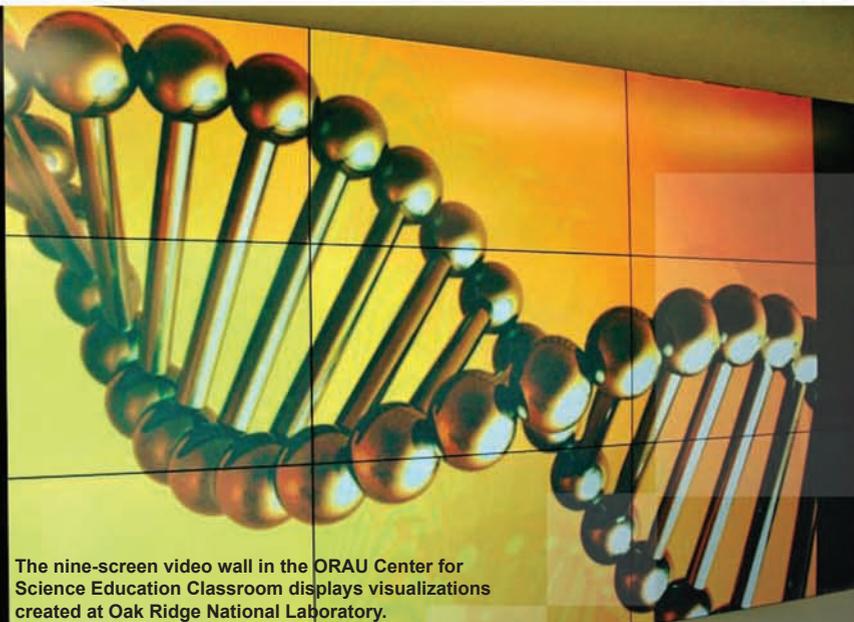
As an open resource for the education community, the ORAU Center for Science Education Classroom breaks down traditional barriers and opens doors to advanced research, rather than having students and teachers read about these new discoveries years later in a textbook. Relying on a hands-on, inquiry-based approach, the Classroom introduces students and educators to new ways of learning including the ability to:

- Analyze authentic data from remote laboratories and research centers
- Manipulate simulations and visualizations using actual scientific models
- Remotely operate microscopes or other scientific equipment physically located at other locations
- Access assignments and information from home or anywhere the Internet reaches
- Connect with other students and teachers through learning networks
- Explore proven products, services, and programs that can help make science and technology education more effective

Creating Teacher Scientists: Connecting Teachers with Laboratory Research



High School Teacher Mike Smith, a participant in the U.S. Department of Energy's (DOE) Academies Creating Teacher Scientists (ACTS), administered by ORAU, studies how strobe lights affect the behavior of certain types of fish. Smith and three other high school teachers were the first to complete the ACTS three-year summer program.



The nine-screen video wall in the ORAU Center for Science Education Classroom displays visualizations created at Oak Ridge National Laboratory.