

# FCR-STEM

Florida Center for Research in Science, Technology, Engineering and Mathematics

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Florida State University

## Content Enhancement Routines Initiative

The Content Enhancement Routines Initiative provides professional development, support and follow-up for secondary math and science teachers and is sponsored by The Florida Center for Research in Science, Technology, Engineering, and Mathematics (FCR-STEM), jointly administered by the FSU College of Arts & Sciences, College of Education and Learning Systems Institute in the Office of the Provost.

This initiative's primary goal is to improve content area instruction in math and science and support the acquisition of literacy for students in Florida. Content Enhancement Routines were developed by the Center for Research on Learning at the University of Kansas (<http://www.ku-crl.org/sim/content.shtml>). Content Enhancement Routines address the challenge of teaching students with different levels and types of background knowledge. Specific devices and procedures access students' prior knowledge, build a level of shared understanding, and generate effective cognitive processes. Using Content Enhancement Routines provides diverse groups of students with a shared foundation for understanding and applying new information in a particular field of study. This approach provides the tools to analyze the kinds of information students need to learn in all disciplines, helps identify the obstacles which some students experience as they learn, and provides effective methods for organizing and presenting information for a wide range of students.

Three routines will be included in 2007-08 Content Enhancement Routines Initiative:

The *Framing Routine* is used to transform abstract ideas and key topics into a concrete representation that helps students think and talk about the key topic and essential related information. Research results have consistently demonstrated that the routine can effectively facilitate subject matter learning as well as literacy and thinking skills.

The *Concept Mastery Routine* is used to define, summarize, and explain a major concept and where it fits within a larger body of knowledge. Research shows that secondary teachers' use of the routine benefits the student in several ways. First, students scored significantly better on tests designed to assess concept acquisition. Second, students scored significantly better on regularly scheduled, teacher-made or commercial unit tests during the enhancement condition than during baseline. Third, the students took better notes during the enhancement condition than before using the routine.

The *Unit Organizer Routine* is used to plan units; introduce and maintain the big ideas in units; and show how units, critical information, and concepts are related. Research results showed that when teachers used the *Unit Organizer Routine*, understanding and retention of information by low-achieving students, students with learning disabilities, and average-achieving students improved substantially over baseline, as reflected in unit test scores and in scores on unit content maps and explanations of these maps. Students of teachers who used the *Unit Organizer Routine* regularly and consistently scored an average of 15 percentage points higher on unit tests than students of teachers who used it only irregularly.

Professional development for the first routine will be delivered in fall 2007 in a three-hour face-to-face workshop at the school, followed by coaching and support. Two more routines will be offered as online courses later in the 2007-2008 school year. The professional development and materials will be provided at no cost.

Participating schools agree to uphold the integrity of the Content Enhancement Routines Initiative by meeting the following requirements:

- Committing to the participation of all teachers within the science and/or math department beginning fall 2007 and continuing throughout the academic year.
- Committing to participating in training and online courses and subsequent implementation by the teachers and instructional leaders in the school, such as the principal, department chairs, and instructional coaches.
- Committing to collecting and submitting student impact data and satisfaction surveys, and teacher implementation and satisfaction surveys.
- Continuing planning for professional development for additional Content Enhancement Routines, including dedicated time for staff planning, ongoing professional development and coaching, and frequent student progress monitoring. (Optional)