Fall 2012 MTI Courses

Fall 2012 Mathematical Thinking for Instruction (MTI) course registration will open May 15th. If you or someone in your district needs to take the class, use this opportunity to sign up.

Registration for Summer 2012 courses is currently open.

Go to the SDE MTI website for schedule and registration information:

www.sde.idaho.gov/site/math/mti.htm

To contact Nichole Hall at the State Department of Education about the MTI course, call 208-332-6933 or email nhall@sde.idaho.gov. To contact a Regional Math Specialist through IDMT, refer to your region below for email addresses.

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<thead>
<tr>
<th>Region</th>
<th>Contact Name</th>
<th>Email Address</th>
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<tbody>
<tr>
<td>Region I</td>
<td>Abe Wallin</td>
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<td>Christina Tondevold</td>
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MTI Update

Initiative for Developing Mathematical Thinking

May 2012
Mathematical Reasoning

Students need to learn different ways to solve mathematical problems, how to use different models and strategies and even interpret how others solve the same problem. These are all important elements of a math classroom focused on teaching for understanding. For teachers seeking to develop mathematical reasoning in their students, it isn’t enough. How do we press students to justify their strategies and models? Can we get students to reason about why their strategies work or don’t work? What will happen when students argue about the validity of their own or their peers thinking? Will these activities lead to conjectures about the mathematics students are studying?

To help answer these questions, let’s look at developing reasoning using the Building Mathematical Understanding framework.

**Take Students’ Ideas Seriously**

It is important to value students’ understanding and ideas by having them share their thinking using mathematical reasoning. We need to assist students’ in accessing their previous mathematical understandings and experiences, and establish meaningful connections between these ideas and new mathematical material by asking them to justify their thinking using grade-appropriate mathematical terminology and representations.

**Press Students Conceptually**

Mathematical reasoning is the accumulation of students’ generalizing, justifying and creating of conjectures. Teachers need to establish a math community in which students are accustomed to justifying and critiquing their own and others strategies and models. Students will go through a progression of what reasoning looks and sounds like from Kindergarten through high school as they formalize their thinking by using language, drawings and symbolic representations. This formalization occurs as students are pressed by higher level questions and a supportive learning environment.

**Encourage Multiple Strategies and Models**

Students’ strategies and models are important in helping them support or refute mathematical ideas. Students should be able to illustrate their thinking with manipulatives, drawings, words, or symbols (e.g., equations).

**Address Misconceptions**

At times students will reason incorrectly as they attempt to justify and generalize their mathematical understandings. These opportunities should be utilized as a jumping off point for instruction and investigation into the mathematics.

(Continued on page 3)
(Cont. from page 2)

Focus on the Structure of the Mathematics

Classroom instruction should focus on facilitating students' understanding of fundamental mathematical concepts (e.g., decomposing and composing, units and unitizing, equivalence, etc.), in order to establish connections and build understanding of the particular topic being studied. Students explore these mathematical concepts, using them to solve problems and communicate the underlying mathematics. Teachers, through their choice of tasks and activities and their focus on discussion can highlight the mathematical concepts embedded within the models and strategies being used.

To conclude, a teacher needs to know that listening and accepting how a student solved a problem is not enough. They need to press those students to make connections, defend their thinking, critique others work and thinking, and develop the habits of mathematical reasoning in their students. To do this well, they must know what they are teaching, why it is important and how it can be “packed” into their students mathematical suitcase.


Mathematics Consulting Teacher Endorsement

A new K-12 Mathematics Consulting Teacher Endorsement (MCTE) is available for teachers in Idaho. The MCTE is focused on increasing the knowledge and skills of math coaches and teacher leaders.

Boise State University is working with the State Department and State Board of Education to offer the MCTE. We are in the final stages of approval. The following table details the potential courses that will be required to receive an institutional recommendation for the MCTE from Boise State University. However, the course requirements are still under discussion.

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<th>Course Number and Title</th>
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<tr>
<td>MTI K-3: NUMBER AND OPERATIONS</td>
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<tr>
<td>MTI 4-8: NUMBER AND OPERATIONS</td>
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<tr>
<td>MTI 6-12: NUMBER AND OPERATIONS</td>
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<tr>
<td>Select a minimum of one of the following:</td>
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<tr>
<td>MTI ADV K-3: EARLY NUMERACY &amp; OPERATIONS</td>
<td>3</td>
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<tr>
<td>MTI ADV 4-8: RATIONAL NUMBERS, PROPORTIONAL REASONING</td>
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<tr>
<td>MTI ADV 6-12: ALGEBRA</td>
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<tr>
<td>Required Courses:</td>
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<tr>
<td>MTI: MEASUREMENT AND GEOMETRY</td>
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<tr>
<td>MTI: PROBABILITY, DATA ANALYSIS, &amp; STATISTICS</td>
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<tr>
<td>ED-CIFS 546 MTI: BUILDING TEACHER LEADERS</td>
<td></td>
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<tr>
<td>ED-CIFS 549 MTI: ACTION RESEARCH</td>
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<td>Total:</td>
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Individuals can begin by taking two levels of the MTI course in their area (i.e., MTI K-3, MTI 4-8, MTI 6-12). To provide the coursework for the remaining MCTE courses both a traditional and cohort route are being planned.

The traditional course route is available to teachers in the Treasure Valley. This involves taking the MCTE courses over several semesters.

- The MTI Probability, Data Analysis and Statistics course is being offered the week of June 11th—15th (offered for professional development or graduate credit).
- The MTI Action Research course is being planned for fall 2012 (offered for graduate credit only).

A cohort route is also being planned to begin in the fall of 2012. The cohort route would involve three 3-day meetings (Thurs-Sat in the fall, winter and spring) in the Boise area and depending on interest, other regions in the state. An additional week-long course would take place during the Summer of 2013. These 3 meetings, with an additional online component, would allow for completion of 3 MCTE courses in one year.

An archived webinar will be available by May 21st that more fully explains the MCTE traditional vs. cohort routes, costs, and credit options. It will be posted to:

www.tinyurl.com/mtifollowup
The MTI Spring 2012 webinars are designed to support school personnel in implementing the concepts and instructional strategies from the Mathematical Thinking for Instruction (MTI) course. In addition, the webinars focus on building familiarity and understanding of the Common Core State Standards (CCSS) by examining strategies, models and contexts that support their implementation.

If you were unable to attend an MTI webinar during the scheduled time, you may access the archived webinar at your convenience. You can watch and listen to the presentation, questions, and discussions as it happened in the live webinar. Any accompanying resource materials are also found on the same website:  
http://www.sde.idaho.gov/site/math/mtiWebinarsArchived.htm

You may participate in the archived webinar as a group or an individual. Participation with any and all archived webinars may be counted towards the available credit option; please visit www.sde.idaho.gov/site/math/mtiWebinarCredit.htm for further information on the MTI Webinar credit option.

MTI Update is created by IDMT, funded by the Idaho State Initiative for Developing Mathematical Thinking

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Visit Us on the Web!

DMT Website: 
dmt.boisestate.edu

SDE MTI Website: 
sde.idaho.gov/site/math/mti.htm

ICTM Conference

The Idaho Council for Teachers of Mathematics (ICTM) are holding their annual conference October 4th & 5th at Borah High School.

The keynote speaker will be Michael Shaughnessy, president of the National Council of Teachers of Mathematics (NCTM). Special guest speakers include Marcy Cook and Gaill Burrell. In addition, several teacher leaders from across the state and the MTI regional math specialists will be also be presenting at the conference. For more information go to the following website: idahoctm.org/4.html

The conference will address multiple topics, such as assisting teachers in the meaningful implementation of the Common Core State Standards, the use of technology in the classroom and instructional practices that help all learners.

Contact your Regional Math Specialist if you are interested in making arrangements for a workshop to be held in your school/district. These can be done after school or during a district in-service time. If a workshop is requested, we ask that a minimum of 15 people be in attendance from the school or district.

For a list of potential workshop ideas or more information contact your regional math specialist.