

## *MDTP in Process of Developing Three New Tests*

### **Prealgebra Readiness Test**

This is the third year of the development of MDTP's first Prealgebra Readiness test. Three middle school mathematics teachers actively participated in the design of this test. It is designed to be given near the beginning of a yearlong course immediately preceding a one-year algebra course. MDTP hopes that teachers will be able to use their class results to help focus attention on some of the mathematical concepts and skills that are critical for success in the following algebra course. For several years, many teachers had requested such a test. It appears that many teachers are using an Algebra Readiness (AR) test in courses preceding algebra—one indication of this is that last year MDTP scored tests in more than 125 schools whose highest grade was sixth or lower. MDTP also hopes that teachers who are using the AR tests in these courses will get more useful information from the new Prealgebra Readiness test.

In 2001 the MDTP workgroup with its middle school consultants wrote a collection of individual test items to address the test specifications which had been developed. In June 2002, student performance on these items was analyzed to help the workgroup determine which individual items should be used or modified for inclusion in a complete test that was balanced by both topic area and by difficulty. The balanced test was field-tested in fall 2002 on thousands of students in hundreds of classes across California. The field-test included administration of an Algebra Readiness test in the spring. In some schools, the field-test is continuing this year with administration of a Geometry Readiness test in algebra courses this coming spring.

In June 2003, the workgroup analyzed and carefully reviewed the data from the 2002–2003 field-testing. Many of the test items performed very well but, as expected, other items needed to be modified. A revised Prealgebra Readiness test was constructed. This year's field-test of that revision will enable the workgroup to determine whether the questions and the test perform as expected. In addition, this second form

gives the workgroup the opportunity to try other variations of some problems so that the more effective version can be included in the first released version. The revised test was administered to several thousand middle school students this fall. Those students will be given the AR45A00 test during spring 2004. In June 2004, the workgroup will review the analysis of this year's field-test data and compare it to last year's. We have high hopes that we will be able to release a Prealgebra Readiness test in time for use in fall 2004. It will be a 40 item test; students will not be allowed to use calculators when taking it.

### **Geometry Readiness and Second Year Algebra Readiness Revisions**

MDTP began working on a consistent set of specifications for all tests in June 2002 by compiling a set of specifications at the Geometry Readiness and Second Year Algebra Readiness levels. Part of this process included a review of the California Standards to ensure that the specifications developed were aligned with them and addressed the key standards that the workgroup considered critical for success in a geometry or second year algebra course. MDTP tests are diagnostic to help teachers identify certain strengths and weaknesses of their classes. They are designed neither to be comprehensive nor to cover all of the standards at any one level.

In June 2003, the workgroup reviewed individual items on the current Geometry Readiness (GR) and Second Year Algebra (SR) tests and identified items to be modified or replaced. These decisions were based upon the test specifications and the item analyses from previous years. The workgroup developed revised versions of both the GR

*Continued on page 4*

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## *A Tribute to MDTP's Unsung Heroes: The Workgroup*

Too often we unwittingly take for granted something that, were we deprived of it, we would miss considerably. Only when no longer available do we recognize how blithely we had undervalued the contribution this particular entity made to our endeavors. Such is probably the case with respect to the Mathematics Diagnostic Testing Project's (MDTP) Workgroup. Most users never come into contact with the workgroup and only know MDTP through the personnel at their regional centers, to whom they address requests for testing materials and scoring. We want to tell you a little about the workgroup and its members.

MDTP is an outgrowth of a 1977 joint CSU/UC faculty conference about entering students' academic preparation. This joint project of the two universities was charged with determining the areas in which competency was necessary for success in certain mathematics courses and with developing diagnostic tests addressing these areas. Since its inception, the two university systems have provided financial support for the workgroup. The workgroup has responsibility for developing MDTP tests and undertaking research related to the tests and other MDTP activities. It serves as the advisory board to the outreach activities of MDTP, setting policy for the operations of MDTP's regional sites and serving as a liaison between MDTP and California educational agencies. The workgroup has played important roles in California's consideration of issues affecting the teaching and learning of mathematics.

The original workgroup consisted of the following faculty: two mathematicians from each of CSU and UC, a chemist and a physicist from each university system, a community college mathematician, and a high school mathematician. Phil Curtis, from UCLA, was the founding chair of the workgroup; Gerald Marley, from CSU Fullerton, was its founding co-chair. In addition, the workgroup was supported by the participation of an ETS consultant, a statistician, and two staff members. The original ETS consultant, Chan Jones, has faithfully attended every summer conference. After three years, Wallace Etterbeek from CSU Sacramento, one of the founding workgroup members, became the project statistician. Last year the workgroup decided that its membership should consist of 11 to 14 faculty, three key MDTP personnel, and two liaisons. The faculty members include mathematicians and scientists; there are now three or four precollegiate mathematicians, including at least one middle school teacher. The liaisons are from the California Mathematics Project and the CSU ELM Test Development Committee. The current chair of the workgroup is John Sarli, from CSU San Bernardino; the current co-chair is Alfred Manaster, from UCSD.

Since 1978 the workgroup has met each summer for a week-long residential working conference. It also meets during the academic year; in addition, its committees meet to further the project's development of testing and other materials. Each summer meeting lasts for an entire calendar week—with no change in schedule for Saturday or Sunday. No matter on which day of the week the residential begins, the schedule usually entails an early breakfast and daily work from 8:30 until noon; from 1:30 until 5; and often committee work and presentations after dinner. Late night sessions occur as the end of the week approaches and work needs to be finalized, proofed, and recorded.

*Visitors to a workgroup residential often remark about the frenzy of activity no matter when they come.*

Visitors to a workgroup residential often remark about the frenzy of activity no matter when they come. Moreover, they say that they had no idea how much work goes into creating one multiple-choice test: the creation of an item; its review by another committee; the next version of said item that results from the negotiation/collaboration of the origination committee and the review committee; the creation of the test as a result of careful item placement; the first field-test of the test; the review of resulting data; the subsequent re-design of the test based upon the analysis of field-test data; the second field-test; the review of that data; the final design of the test (assuming data so allows); the checking and balancing of keys on the final test; taking the test (entire workgroup); and final proofing by the director of the project and others. Written response materials go through the same degree of fastidious development.

Such is the work of the workgroup, and it is to them we must attribute many of the kudos associated with the quality of MDTP's final products. As a tribute to the members of the MDTP workgroup, who have dedicated themselves to producing quality materials to help you accomplish what you want to do in the classroom, we hope you remember their contribution the next time you use MDTP products and services. We also trust this article expresses our gratitude for the past and future endeavors undertaken by this invisible group for all California students.

## *Lest we forget . . .*

- Correctly completing header sheets for each set of answer sheets is essential for getting back your scoring reports promptly. Failure to do so could result in test scoring errors or a significant delay in scoring until a staff member has time to correctly prepare the header sheets. Please take the time to review all materials before sending them in for scoring. The time you spend doing this before we receive them will pay off in quicker returns of your results.
- A "suggested time" is printed on the cover of MDTP test booklets. That time may be adjusted as needed by the school or teacher. MDTP recommends that testing occur within one sitting whenever possible.
- More actual test time can be available by having students complete the personal and class information on the answer sheet prior to the day of the test.
- Each teacher should receive separate results for each class scored. Teachers should not combine their classes into one set before they are scored. Upon request, most MDTP sites also can provide aggregated data to teachers, schools, and districts for use in analyzing curricula. Check with your site director to see if aggregated reports are available and to discuss them. Our dissemination policy is available on-line at <http://mdtp.ucsd.edu/MDTPdisseminationPolicy.shtml>.
- After each administration of a test, the booklets should be checked for writing and any marks should be erased before storing for subsequent use.

## *MDTP Teacher Institute Planned*

MDTP is planning its fourth teacher institute to be held at UCLA August 8–12, 2004. The purpose of these institutes is to develop a cadre of teachers who are both experienced with and well-informed about MDTP, its materials, and its services. It is our intent to form partnerships with alumni of these institutes so that in all ten of our regions we will have people with whom site directors may collaborate to provide better outreach to all California schools. At these institutes we work together in a relaxed, collegial spirit to create and critique presentations designed for various kinds of school audiences throughout the state to highlight MDTP's philosophy and intended uses.

If you are a long-time user of MDTP who would like to spend four days in a residential institute collaborating with others like yourself and are looking for an opportunity to further your professional leadership skills, please consider applying to attend this institute. Alumni of past institutes have remarked that one of the unexpected benefits of attending the institute was the chance to work with mathematics educators who teach at different levels, middle schools through university. Since participants come from all over the state, they seized the opportunity to extend their collegial network to include new associates outside their immediate school site and local district with whom they could develop an ongoing professional relationship. Many institute alumni have made presentations about MDTP at conferences and have supported good uses of MDTP materials with colleagues in a variety of ways. Applications for the August 2004 institute are available from your regional site and are due by February 27, 2004. All applicants will be notified by April 2, 2004. Participants will receive a stipend of \$400 and will be reimbursed for travel expenses. If you have further questions about the institute, contact its director, Barbara Wells, at UCLA ([bgwells@math.ucla.edu](mailto:bgwells@math.ucla.edu) or 310.206.8360).

## *Upcoming Users' Conferences*

Teaching is often described as a lonely profession. The picture of the lone teacher stuck inside an empty classroom correcting a stack of papers often comes to mind when this is said. To a degree, there is some truth in this. Many of us chose the contemplative life and readily acknowledge that a lot of our work is done alone. However, an invigorating exchange of ideas among people who are facing the same challenges can provide enlightened perspectives and a renewal of energy. The MDTP Regional Users' Conferences are an example of the kind of professional engagement that we hope produce such results. We know there are many of our users who have never attended a Users' Conference in their region. If this describes you, why not consider attending one of these events this year (and consider having a colleague join you)? We think you will be rewarded.

### **CSU Fullerton**

Wednesday, January 21, 2004

3:00 - 8:00 p.m.

McCarthy Hall and Fullerton Marriott

Contact: Christine Brackett

(714) 278-8320

### **UCLA**

Saturday, January 24, 2004

8:30 AM - 1:30 PM

UCLA Mathematical Science Bldg.

Contact: Johnna Keh

(310) 825-8030

[johnna@math.ucla.edu](mailto:johnna@math.ucla.edu)

### **UC San Diego**

Saturday, March 27, 2004

9:00 AM - 12:30 PM

UC San Diego campus

Contact: Jean Forsythe

(858) 534-3373

[jforsythe@ucsd.edu](mailto:jforsythe@ucsd.edu)

## *Refocusing upon Written Response Materials*

The written response materials that MDTP began distributing in 1994 have received numerous laudatory comments from teachers, mathematicians, and mathematics educators who have seen or reviewed them. One of our challenges, however, continues to be making the great number of users of our multiple-choice tests aware of the existence, availability, and benefits of these resources. If the reception they were accorded by the attendees of this fall's CMC-S conference in Palm Springs is any sign, then this state of affairs is about to change. Many who saw the materials demonstrated were eager to get them and there was such demand that many had to sign up for them to be sent after the conference.

The written response materials are provided in a binder and are separated by tabs for each level—namely, Algebra Readiness, Geometry Readiness, and so on through Calculus Readiness. As more items are developed, we send them to those people who have completed and returned the sheet in the binder that records their first experience using one of the items.

As we continue developing these materials, we are always looking for classes in which to field-test them. We are currently field-testing materials for Geometry Readiness, Second Year Algebra Readiness, and Mathematical Analysis Readiness. If you or any of your colleagues would be willing to participate in this endeavor, please contact your site director. It entails using one of the items in an appropriate class, using the provided essence statement and rubrics to score the papers, and returning some of the scored papers to us with an evaluation form about your experience.

Professional development budgets (like all others) have been seriously decreased in most places. Yet a profound and valuable type of professional development can be accomplished

for no more money than that needed to get a group of teachers together to collaboratively score their students' work on these written response materials. Discussions about the application of specific and general rubrics and essence statements to individual student papers provide a rich and rewarding activity for serious mathematics educators. Sometimes differences in scoring a single paper reveal mathematical nuances about the topic that would not be revealed without such scrutiny.

Just as communicating their understanding of the mathematics allows students to delve deeper into the subject, so do professional development opportunities such as these rubric application sessions provide their teachers with a more varied and reflective perspective of the mathematics that is the focus of their ongoing work.

### *Three New Tests (continued from page 1)*

and SR calculator optional test forms. The revised tests were field-tested this fall, and post-tests will be administered during the spring. The field-test data will be analyzed and reviewed during the summer. While we may need further field-testing for one or both of them next year, we may be able to release one of these tests for use in fall 2004.

### *Tom's Teasers* as in Tom Walters, former UCLA Site Director

- Two squares are removed from opposite corners of a checkerboard, leaving 62 squares. Can the checkerboard be filled with 31 dominoes, each domino covering two adjacent squares?
- Which is larger, the 10th root of 10 or the cube root of two? (No calculators, please!)
- The game of toe-tac-tic has the same rules as the standard game with one exception. The first player with 3 markers in a row loses. Can the first player always win?

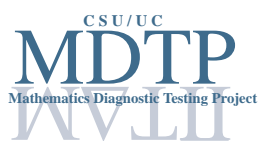
**Answers in next issue!**

#### *Answers to April 2003 Brain Teasers*

- $r = 18$
- That would be  $\frac{4}{7} \cdot \frac{3}{6} \cdot \frac{2}{5} \cdot \frac{1}{4} = \frac{1}{35}$

This is an interesting result because it is the same as picking the evens first.  $\frac{3}{7} \cdot \frac{2}{6} \cdot \frac{1}{5}$  [You can see the Pascal triangle symmetry here; picking the odds is not picking the evens.]

- Two possible responses are shown:  $2 \cdot 9 + 6 - 7 = 17$  or  $\sqrt{(296 - 7)} = 17$



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See the MDTP Website: <http://mdtp.ucsd.edu>

## MDTP TESTS AVAILABLE

Test Level/ Test Name	Description	Calculator Prohibited	Calculator Optional	Calculator Required
<b>AR</b> Algebra Readiness	Tests readiness for success in a first course in algebra. The calculator prohibited versions require more arithmetic facility.	AR50/90 0715090  AR45A00 0714500		AR50X92 0775092
<b>EA</b> Elementary Algebra Diagnostic	Tests readiness for success in a second year algebra course. Appropriate when the second course follows immediately after the first year algebra course and students have not been exposed to a year of geometry.		EA50A90 0315090	<i>Scientific</i> EA45X91 0374591
<b>GR</b> Geometry Readiness	Tests readiness for a geometry course. Includes some informal geometry students should have encountered prior to and during algebra. Would most likely be given near the end of Algebra I or near the beginning of a geometry course.		GR45A93 0414593	GR45X94 0474594
<b>SR</b> Second-Year Algebra Readiness	Tests readiness for success in a second year algebra course that follows a geometry course. Measures first-year algebra and geometry topics critical for success in second year algebra. Appropriate near the end of geometry or near the beginning of second year algebra.		SR45A93 0314593	<i>Scientific</i> SR45X94 0374594
<b>IS</b> Integrated Second Year Readiness	Tests readiness for success in the second year of an integrated algebra curriculum. This test was based on the common content of two of the integrated curricula in use in California.		IS45A00 0414500	
<b>IT</b> Integrated Third Year Readiness	Tests readiness for success in the third year of an integrated algebra curriculum. This test was based on the common content of two of the integrated curricula in use in California.		IT45A00 0314500	
<b>MR</b> Mathematical Analysis Readiness	This test assumes two years of algebra and a year of geometry in preparation for a precalculus course. It has significant geometry content. It would ordinarily be given near the end of the prerequisite courses or near the beginning of the next course, typically trigonometry, precalculus, or mathematical analysis.		MR45A92 0214592	<i>Scientific</i> MR45X94 0274594
<b>CR</b> Calculus Readiness	Tests topics needed for success in a first calculus course. The CR versions contain more emphasis on geometry. Suggested times are 60 minute for 40 question tests and 90 minutes for tests with 55 or 60 questions. PC versions are still available on a limited basis. PC40 versions are available in Spanish.		CR40A97 0114097  CR55A97 0115597	<i>Scientific</i> CR40X96 0174098  CR55X96 0175596
<b>BC</b> Beginning Calculus	This test is designed for students in a first calculus course requiring graphing calculators. Students need to decide when to use a graphing calculator. The test can help identify strengths and weaknesses of students' mathematical skills and abilities and can provide information about students' facility with graphing calculators. Suggested time is 60 minutes.			<i>Graphing</i> BC30X97 0173097

Spanish versions for all MDTP tests are available at the AR, EA, GR and SR levels, and for MR45A92 and PC40 test versions.

### Written Response Materials Notebook

Written response materials allow students to communicate their understanding of the important conceptual ideas in their mathematics courses. Each notebook includes a general rubric that defines scoring criteria for all MDTP written response items in addition to an essence statement and a specific rubric for each item. The content for the items is linked to the topics on the diagnostic tests.

# MDTP Regional Sites



<p><b>Berkeley</b> Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Sonoma, and Stanislaus counties.</p>	<p>Emiliano Gomez (510) 642-0752 Dave Mina (510) 642-0846 Fax: (510) 642-6726</p>
<p><b>Chico</b> Butte, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Nevada, Plumas, Shasta, Sierra, Siskiyou, Tehama, Trinity, and Yuba counties.</p>	<p>Jack Ladwig (530) 898-6367</p>
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<p><b>Fullerton</b> Orange County, and schools in Los Angeles and Riverside counties near Fullerton.</p>	<p>David Pagni (714) 278-2671 Christine Brackett (714) 278-8320 Anna Hanson (714) 278-2691 Fax: (714) 278-3972</p>
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<p><b>San Bernardino</b> Schools in and NW of the city of Riverside in Riverside County and San Bernardino County.</p>	<p>John Sarli (909) 880-5374 Tiffany Hughes (909) 880-7670 Fax: (909) 880-7119</p>
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