

## OVERVIEW

### Historical Overview

The Maryland School Assessment (MSA) program replaces the Maryland Student Performance Assessment Program (MSPAP), which had been administered from 1992 to 2002. In 2003, the MSA Reading and Mathematics Assessments were introduced in Grades 3, 5, 8, and 10. In 2004, Grades 4, 6, and 7 were added to the program. CTB/McGraw-Hill was responsible for the Mathematics assessments in Grades 3 through 8 and the Reading assessment in Grade 10. In 2006, CTB/McGraw-Hill was only responsible for the Mathematics assessments in Grades 3 through 8. This technical report addresses only those assessments for which CTB/McGraw-Hill was responsible.

The MSA Mathematics assessments include CTB/McGraw-Hill's *TerraNova* survey (TN) as well as custom selected-response (SR), student-produced-response (SPR), and constructed-response (CR) items written to measure performance on the Maryland content standards. *TerraNova* survey Form C was administered at Grades 3, 4, 5, 7, and 8; *TerraNova* survey Form D was administered at Grade 6.

In 2003 and 2004, two types of scores were reported for the Reading and Mathematics assessments: Norm Referenced Test (NRT) scores and Criterion Referenced Test (CRT) scores. The NRT scores were computed using *TerraNova* items only. The CRT scores were calculated using the custom items written to the Maryland content standards plus a subset of *TerraNova* items that align with the state content standards. In 2005, both NRT and CRT scores were reported for Mathematics, but only CRT scores were reported for Reading. In 2006, both NRT and CRT scores were reported for Mathematics.

A Bookmark standard setting was conducted in 2003 to set proficiency level cut scores for the Mathematics tests in Grades 3, 5 and 8 and the Reading tests in Grade 10. Because 2004 was the first testing year for Grades 4, 6, and 7, a second Bookmark standard setting was held in summer 2004 to set cut scores for these additional grades. The performance level cut scores obtained from the standard setting are used to assign students to three proficiency levels (basic, proficient, and advanced) for AYP reporting under the "No Child Left Behind" act. Information about the Bookmark procedures and results can be found in separate standard-setting technical reports, submitted to the Maryland Department of Education in August 2003 and August 2004.

## **Development of Items and Tests to Meet the MSA Statewide Academic Learning Standards**

The MSA Mathematics assessments are designed and constructed to meet the Maryland Statewide Academic Learning Standards. (For purposes of item development and review, these standards are referred to as the “Content Standards and Assessment Limits.”)

The item development process used for MSA is an iterative process, involving multiple rounds of item review and revision. The processes used for developing items for the 2005 test administration are described below. Item writing began in early February, 2003, and the item content review meeting was held July 14-16, 2004.

1. MSDE and CTB staff attended item writer training sessions in Tacoma, Washington. MSDE staff trained the item writers on the Maryland content standards and assessment limits. CTB staff provided training on the item specifications documents.
2. Items were edited by CTB staff. MSDE staff came to Monterey and reviewed the items with CTB staff during a nine day “side-by-side” review in April 2004 to prepare for item content review.
3. Separate committees comprised of Maryland educators were convened for content and sensitivity. The content review committee members recommended edits, and then the sensitivity committee reviewed items. MSDE and CTB staff reviewed and reconciled all recommended edits during “side-by-side” reviews for three days. Form selection also occurred at this time.
4. Following the item content review meeting, test book manuscripts were prepared and the items were reviewed for style at the time manuscripts were processed. During the page production cycles, items underwent further content and style refinements.

## **Test Design and Specifications**

Table 1 shows the test designs for Mathematics Grades 3 through 8. The test designs presented in this table represent the targeted test design for each grade, and show the targeted distribution of score points by content standard. The final operational forms may deviate slightly from these targets.

For Mathematics, some standards are combined for reporting purposes. Table 2 presents the actual distribution of score points by reporting category for Mathematics.

Table 1  
Test Designs by Grade / Content

Grade 3 Mathematics

	Content Standard	TerraNova Items that Contribute to CRT Score	Number of CRT SR Items	Number of CRT BCR Items	Points	Percent
1	Algebra, Patterns, and Functions	12	11	1	13	18%
2	Geometry	16, 17	5	1	8	11%
3	Measurement	10, 14	4	1	7	10%
4	Statistics	24	10	1	12	17%
5	Probability		2		2	3%
6	Number Relationships and Computation	1, 2, 4, 13, 18	8	3	16	22%
7	Process of Mathematics			7	14	19%
	<b>Total Score Points</b>	<b>11</b>	<b>40</b>	<b>21</b>	<b>72</b>	<b>100%</b>

Grade 4 Mathematics

	Content Standard	TerraNova Items that Contribute to CRT Score	Number of CRT SR Items	Number of CRT BCR Items	Number of CRT ECR Items	Points	Percent
1	Algebra, Patterns, and Functions		13	1		14	20%
2	Geometry	20	5	1		7	10%
3	Measurement	31	5	1		7	10%
4	Statistics		7	1		8	11%
5	Probability		6	1		7	10%
6	Number Relationships and Computation	1,2,3,4,10, 17,18,27	4	2		14	20%
7	Process of Mathematics			7		14	20%
	<b>Total Score Points</b>	<b>10</b>	<b>40</b>	<b>21</b>		<b>71</b>	<b>100%</b>

Grade 5 Mathematics

	Content Standard	TerraNova Items that Contribute to CRT Score	Number of CRT SR Items	Number of CRT BCR Items	Number of CRT ECR Items	Points	Percent
1	Algebra, Patterns, and Functions	27, 28	11	1	1	15	20%
2	Geometry	13	4	1		6	8%
3	Measurement	17, 23, 26	4	1		8	11%
4	Statistics	12	7	1		9	12%
5	Probability	32	2	1		4	5%
6	Number Relationships and Computation	2, 4, 6, 8, 31	8	2		15	20%
7	Process of Mathematics			7	1	17	23%
	<b>Total Score Points</b>	<b>13</b>	<b>36</b>	<b>21</b>	<b>4</b>	<b>74</b>	<b>100%</b>

Table 1 (cont.)  
Test Designs by Grade / Content

Grade 6 Mathematics

	Content Standard	TerraNova Items that Contribute to CRT Score	Number of CRT SR Items	Number of CRT BCR Items	Number of CRT ECR Items	Points	Percent
1	Algebra, Patterns, and Functions	13	11	1	1	14	20%
2	Geometry	17	6	1		8	11%
3	Measurement		5	1		6	9%
4	Statistics		8	1		9	13%
5	Probability		4			4	6%
6	Number Relationships and Computation	6, 18, 20	9	2		14	20%
7	Process of Mathematics			6	1	15	21%
	<b>Total Score Points</b>	<b>5</b>	<b>43</b>	<b>18</b>	<b>4</b>	<b>70</b>	<b>100%</b>

Grade 7 Mathematics

	Content Standard	TerraNova Items that Contribute to CRT Score	Number of CRT SR Items	Number of CRT SPR Items	Number of CRT BCR Items	Number of CRT ECR Items	Points	Percent
1	Algebra, Patterns, and Functions		9	3	1	1	14	20%
2	Geometry		4	2		1	7	10%
3	Measurement	24	3	1	1		6	8%
4	Statistics		5	1	1	1	8	11%
5	Probability		3	2	1		6	8%
6	Number Relationships and Computation	3, 9, 13, 15, 32	6	3			14	19%
7	Process of Mathematics				4	3	17	24%
	<b>Total Score Points</b>	<b>6</b>	<b>30</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>72</b>	<b>100%</b>

Grade 8 Mathematics

	Content Standard	TerraNova Items that Contribute to CRT Score	Number of CRT SR Items	Number of CRT SPR Items	Number of CRT BCR Items	Number of CRT ECR Items	Points	Percent
1	Algebra, Patterns, and Functions	21, 29	6	4	2	1	15	20%
2	Geometry	27	4	2	1		8	11%
3	Measurement	16	2	1		1	5	7%
4	Statistics	13	5	1	1	1	9	12%
5	Probability		2	2	1		5	7%
6	Number Relationships and Computation	2, 3, 6, 7, 20, 26	6	2			14	19%
7	Process of Mathematics				5	3	19	25%
	<b>Total Score Points</b>	<b>11</b>	<b>25</b>	<b>12</b>	<b>15</b>	<b>12</b>	<b>75</b>	<b>100%</b>

Table 2  
Summary of Score Points

Content Standard Reporting Category	Grade 3		Grade 4		Grade 5	
	Score Points	Percentage	Score Points	Percentage	Score Points	Percentage
1	13	18.1%	14	19.7%	15	20.3%
2&3	15	20.8%	14	19.7%	14	18.9%
4&5	14	19.4%	15	21.1%	13	17.5%
6	16	22.2%	14	19.7%	15	20.3%
7	14	19.4%	14	19.7%	17	23.0%
<b>Total</b>	72	100%	71	100%	74	100%

Content Standard Reporting Category	Grade 6		Grade 7		Grade 8	
	Score Points	Percentage	Score Points	Percentage	Score Points	Percentage
1	14	20.0%	14	19.4%	15	20.0%
2&3	14	20.0%	13	18.1%	13	17.3%
4&5	13	18.6%	14	19.4%	14	18.7%
6	14	20.0%	14	19.4%	14	18.7%
7	15	21.4%	17	23.6%	19	25.3%
<b>Total</b>	70	100%	72	100%	75	100%

## **Processing and Scoring of Test Materials**

CTB's primary goal in the scoring and processing of test documents is to deliver quality results to MSA according to established timelines. The accuracy and timeliness of reports are the primary concerns of the team devoted to providing scoring services.

CTB's MSA scoring team is based in Monterey, California and Delran, New Jersey. This team of trained technical specialists has been responsible for coordinating all scoring and reporting activities related to the processing of MSA test documents. Document preparation, interdepartmental coordination and communication, processing specifications, and problem resolution are functions to be performed by a designated Scoring Project Manager from this team. The scoring team works closely with all CTB departments to ensure successful scoring and reporting of MSA.

## **Scoring Process Overview**

CTB's scoring process includes many quality assurance steps that are integrated into each step. Presented below, in order of occurrence, are quality assurance procedures applicable to the Scoring and Reporting process.

### **Pework**

Prior to document arrival at CTB, the scoring team utilizes available customer data to prepare materials to expedite the document-handling process. Team members verify the accuracy of the following materials:

- Expected number of students by grade and school
- Test date
- Precoded headers generated from school/district enrollment files
- Return Shipping Labels
- Report services specifications
- Sample reports
- Report collation examples
- Report packing schematics
- Document type (i.e., selected response/constructed-response)
- Packing lists generated for report shipments
- Other requirements to meet MSA specifications

Prior to receipt of answer documents, detailed scoring specifications for MSA are distributed to the various workstations involved in the scoring and editing process.

### **Receiving**

Shipments are tracked electronically, from the time of pickup at the sites, until delivery at CTB. After receipt, documents are organized by LAC. For each LAC the following steps were performed:

1. The box count is verified against the carrier's bill of lading and/or box count indicators as printed on the outside of the box. If a discrepancy is encountered, boxes are placed in a problem resolution area and discrepancy procedures are enforced. If missing boxes are not located within 24 hours, the Scoring Team is notified and they contact the LAC for resolution.
2. The shipment is checked for damaged materials. If the integrity of the documents is affected by any kind of damage, the Scoring Team is notified. Depending on the severity of the problem, the team member contacts the LAC for resolution. A record of all damaged materials is maintained.
3. Before documents leave the Receiving area they are logged into the computerized tracking system which provides real-time information regarding the status of the documents throughout the scoring and editing process. The electronic profile for each LAC is updated with at least the following information:
  1. LEA name
  2. Date of receipt
  3. Box count
  4. Shipping carrier

CTB follows-up with each LAC whose test materials are not received by the date agreed upon by CTB and MSDE.

### **Login**

Documents released by Receiving are transferred to Log-In, where the following activities are performed:

1. The headers (Group Information Sheets) are checked against School Group Lists (SGLs) to verify the number of students tested within each group (class).
2. The documents are grouped in manageable stacks and document alignment is checked to ensure proper scanning.
3. A scannable header is placed on top of each stack and a number is assigned to identify each unique stack of documents within a group.

## **Scanning**

After login verifies all of the information has been received and has prepared the documents for scanning, the documents are moved to the scanning area. Here they are cut into single sheets and electronically scanned. Scanners are calibrated periodically.

The scanners used by CTB have built-in checks for miscalibration. Hardware bias checking is used in real-time to verify that the scanner calibration is maintained during the scanning process. Additional checks are implemented by CTB to reinforce the built-in hardware checks and to ensure optimal scanner setup.

CTB's scanning software utilizes the speed of the NCS 5000I optical scanners to capture document images and bubbled data without requiring specific document editing and resolution rules. Scanners are thus able to run at rated speed with no interruptions except for problems with the physical documents. All editing of the scanned documents is performed, in a subsequent step, in the raw scoring/editing system.

The scanning program evaluates every detectable mark on both sides of each page, and records the intensity and coordinates of solid marks for resolution in the subsequent raw scoring step. The form identification (i.e., "skunk marks") determines the type of document, and the headers determine customer identification and district, school, and class.

## **Editing/Updates**

Raw scoring and editing of scanned data is performed in a client/server system (WinScore), where a sophisticated system of edits are invoked to review the integrity of each batch scanned and to produce a list of error suspects. While the editors can view data from any document on-line, the error suspect list concentrates on the most likely problems based on pre-defined guidelines. This system reduces editing time and provides a high degree of quality control.

CTB continues to enhance the capability of editing software to simplify the detection and correction of errors. On-line editing screens focus an editor on potential problems and then provide related information. The actual scanned documents are always available to the editor, and the software supports the review and correction of any field in the scanned record. Entry and verification of the necessary corrections are enhanced to ensure each error is actually corrected.

As batches are extracted for scoring, a final edit is performed to ensure all requirements for scoring are met. This automated final edit flags a batch for further editing if any error is still detected. A batch containing errors cannot be extracted for reporting. This ensures a high level of accuracy of the scored data.



CTB has maintained a professional staff of specialized data processing technicians to lead the verification process to ensure the integrity of the student response data at both group and individual levels. This process includes the following error checks:

1. **Reliability.** This check ensures that the raw scores for each subtest are above chance levels. Scores not passing this edit are checked by a trained specialist to ensure that responses are being read correctly and that the correct form and level of the test is being used.
2. **Biographical data.** Electronic edits are performed on such elements as student name to ensure leading or embedded blanks are corrected when possible.
3. **Student counts.** Actual counts based on scanned records are electronically compared with expected counts, and discrepancies are flagged.
4. **School name/number.** Pre-assigned school numbers and names are verified against an electronic file.
5. **Custom edits.** Special edits can be performed using custom software that works in conjunction with our standard scoring process.

### **Document retention**

When the editing process is completed, documents are moved to a staging area to be prepared for retention. Bundles are caged, warehoused in a recoverable location, and retained for possible retrieval during the specified retention period. Once this period is over, documents are destroyed according to procedures that ensure security is maintained.

### **Scoring/Reporting Software**

The primary set of products utilizing CTB's mainframe scoring software (EISS) is *TerraNova* Survey and MSA.

- **Shelf software** supports each test available in the CTB annual catalog. When a customer's scoring request is entered on a scoring order screen, the software activates the scoring and reporting requested by the customer. Parameters from the scoring order screen control which scoring and reporting programs are executed, as well as the content and sequence of the printed output.
- **Custom software** is necessary to support contracts with unique requirements. CTB has developed many modules to meet customized scoring and reporting requirements. In addition, our large programming staff can develop new software to meet the needs of a new customization. CTB has the resources to develop custom software for very large and complex contracts.

EISS receives data from WinScore. The data is scored, summarized, sorted/selected, and reported according to the contract requirements. This system is optimized for efficient high volume processing, and providing for maximum flexibility to fulfill the contract's specific needs.

### **Advanced Function Printing (AFP)**

The IBM Advanced Function Printing (AFP) system is a key factor in CTB's ability to print large volumes of reports with varied content and sequences. CTB provides the functionality to print reports in the actual shipping sequence, with no manual sorting or collation required. In addition, each page may contain complex graphics and the visual aids necessary to clearly convey the information to the wide variety of people who read the reports. CTB converted all mainframe systems to AFP and developing all new reports in this environment.

AFP operates on high-speed laser printers using large roll feeders for several hours of uninterrupted printing at a rate of over 200 pages per minute. The printers' output processors then separate packages, or sets, of reports.

AFP supports report collation. Reports can be printed in any desired sequence, since the contents of each set of reports can be predefined. The sequence in which these packages are printed is also predefined. A "break page" of control and routing information precedes each package of reports. For example, for a district-wide school package, the break page may contain test, type of report, report level/grade, school name, principal's name and school address information. Packages are produced in the final order for quality checks and packaging for shipment.

With AFP graphic capabilities, CTB can design more meaningful reports. Form and content can be varied at any time while printing, fonts can be mixed on a page, graphics can be added, and complex graphics can be inserted to represent variable data.

CTB adopts procedures to provide unprecedented flexibility in the reporting software. In many cases, an application program need not be changed to modify or enhance a report; the much simpler AFP page definition can be changed, leaving the application program intact. Thus, programming, testing, and quality assurance are all simplified.

### **Scoring Quality Assurance**

The Technology and Scoring Departments at CTB both have quality assurance sections specifically charged with reviewing scoring data and reports during all stages of the process. The Technology quality assurance team verifies the accuracy of all reporting programs before they become operational. The Scoring quality assurance team verifies the accuracy of report information during the scoring process. After all data is entered into the scoring system and all reporting programs are completed, a sample of reports are printed and submitted to the Scoring quality assurance group. They review the sample reports extensively to verify the accuracy and correct presentation of all data.

### **Red Team Review**

During the scoring process, numerous quality assurance checks are in place to ensure the complete accuracy of reports. Prior to delivering any electronic files or hard-copy score reports, all reports underwent one final, extensive quality check, known as a "Red Team

Review.” Red Teams are comprised of individuals from every CTB department coming together to form an interdisciplinary team. Samples of each type of report are printed from the active scoring system, and the Red Team carefully reviews these samples for accuracy and correct format, as well as a number of other issues including:

- Verify contents of reports against scoring specifications, report schematics and the Department approve format
- Reports print on correct form/color
- Reports collate correctly
- Data reported is reasonable (A complete data reasonableness check done by Research is completed prior to Red Team Review)
- Student-level data is accurate, compared by hand with student rosters and other documentation
- Required footnotes are in place
- Proficiency ranges reported match with scaled score ranges
- Cut scores are correct
- Reports are not sent out until all necessary corrections determined by the Red Team are resolved and samples of all reports sent to the Department are approved for distribution.

### **Handscoring Process**

For MSA, the electronic handscoring system is used to score constructed response (CR) items. The imaging handscoring system presents images of scanned test books to trained readers, who assign scores for constructed response items. Scanned output is viewed on high quality 19" workstation monitors. Images of each student's responses are automatically routed to two or more readers when required, and images of specific subsets of test items are routed to designated groups of readers trained to score these items. In addition to increased reader reliability, significant gains in reader productivity are noticed following the implementation of this technology.

CTB is committed to using the finest imaging equipment, software presentation system, data management system, and quality control to provide valid, reliable, cost-efficient scoring.

## **Constructed-Response Scorers**

### **Scoring Personnel**

CTB recruits, trains, and manages a sufficient number of staff to complete all handscoring operations within the time lines of this contract. CTB's experience involves extensive consultations between CTB Scoring, Publishing, and the customer to review scoring rubrics, develop anchor papers and other reader training materials, and provide analyses of student responses to tryout forms.

### **Readers**

Many CTB readers have a great deal of classroom teaching experience. Our reader pool includes editors, published authors, and a number of individuals with advanced degrees. The minimum qualification for all Scoring Center readers is a Bachelor's degree.

All MSA CR items are scored in Delran, NJ. Handscoring readers were recruited from the southern New Jersey and Philadelphia areas. In order to work as a Handscoring reader at CTB, one must possess, and show evidence, of having either a BA or BS degree. The evaluator staff is comprised of individuals from many walks of life -- from retired or current educators to engineers, all possessing BAs to PhDs.

### **Team Leaders**

Team leaders are selected on the basis of having demonstrated a high degree of scoring accuracy and consistency, often across multiple subjects and grades. They must also possess good interpersonal and leadership skills in order to be effective when training and counseling readers. The ratio of readers to team leaders is no more than 10 to 1. While it is possible to conduct handscoring with more readers per team leader, it has been CTB's experience that inter-rater reliability and production goals are jeopardized unless a trained leader can frequently monitor all readers.

### **Scoring Supervisors**

Scoring Supervisors are the core group at CTB scoring centers. They direct and organize the assessment process, and train team leaders and readers. Scoring Supervisors have extensive experience as Team Leaders prior to their qualification and selection. The Scoring Supervisors are subject area experts in the content(s) that they supervise and train.

### **Anchor and Training Papers**

Prior to the actual scoring, the CTB Scoring Center creates training materials. CR items for the MSA are assessed using MSDE holistic rubric with an X-point score scale. CTB randomly samples student answer documents to ensure that we are looking at a representative sample of the possible responses. A Rangefinder meeting is held with

MSDE staff and representatives to select sample papers of each score point. These samples are used to construct scoring guides and training papers. CTB's scoring team collaborates with MSDE to make any revisions to the rubrics and selection of scoring guide and training papers.

The process includes several presorting steps and subsequent iterative/consensus processes in order to achieve ever-increasing agreement and precision through a kind of "round robin" scoring, followed by discussion and selection.

When all papers for a form are selected and assigned status as good anchors training, qualifying, or check-set papers, they are consolidated into training formats. Once approved by MSDE, the Scoring Guides (consisting of rubrics, anchors, and annotations) serves as a constant, setting the course for all subsequent training and scoring.

### **Training**

Validation is a critical task in the assessment training process. It is the final determinant in reader readiness. All readers, including team leaders, must achieve 80 percent exact agreement on the qualifying round following training. Those readers not validating on the first attempt receive further training prior to taking an additional qualifying round. Only those training who successfully validate are qualified as readers and could score tests. Team leaders are required to complete two validation rounds with 80 percent exact agreement in each round.

### **Intra-rater Reliability**

Throughout the course of the handscoring process, calibration sets of pre-scored papers (check-sets) are administered daily to the team leaders as well as to the readers, to monitor scoring accuracy and to maintain a consistent focus on the established rubric and guidelines. Imaging permits this monitoring without reader knowledge of when a check-set is administered. Readers whose check-set scores fall below the qualifying level are removed from live scoring and are given additional training and another qualifying (validation) round. Readers unable to qualify are dismissed.

The "read-behind" is another valuable intra-rater reliability monitoring technique. On a daily basis, each team leader reads a random selection of each reader's scored items. The scores are compared, and if they agree, the team leader is able to offer feedback, which enhances the reader's confidence and ability to score quickly and accurately. However, if an individual is straying from the standard established in the training and validation samples, the aberrant scoring is detected, and the team leader is able to offer the guidance necessary to refocus the reader's effort. Readers whose scoring is inconsistent are read behind more frequently by their team leaders. Thus, any scoring variation is corrected.

### **Inter-rater Reliability**

Each constructed response is scored by at least two readers, and inter-rater reliability is monitored throughout the scoring process. If the scores of the two assigned readers differ by one point, the student will receive the higher of the two scores. If the scores of the two readers differ by more than one point, a third rating is provided by an expert rater, who will resolve the discrepancy and assign a final score.

### **Characteristics of the Test Population**

Table 3 shows the ethnic characteristics of the students who took the 2006 MSA. Because percentages are rounded up to whole numbers, the percentages in this table do not always sum to 100. Among the Mathematics examinees, 47 to 50 percent were White, 37 to 40 percent were African American, and 7 to 9 percent were Hispanic. As expected, these percentages were similar across all test forms within a grade, because the test forms were spiraled within the classrooms. As shown in Table 4, there were slightly more male students than female students. The 2006 distributions of ethnicity and gender for the Mathematics tests are essentially the same as the 2003, 2004, and 2005 distributions.

Table 3  
2006 MSA Ethnic Composition by Grade Level and Test Form\*

Grade	Test Form	Number of Students**	Percent White	Percent African American	Percent Hispanic	Percent Others
3	A	12388	48	37	9	6
	B	12213	48	38	9	6
	C	12087	48	38	8	6
	D	11907	48	37	9	6
	E	11793	48	38	8	6
	Total	60388	48	38	8	6
4	A	12622	49	37	9	6
	B	12517	48	38	8	6
	C	12337	49	37	8	6
	D	12257	48	37	8	6
	E	12052	49	38	8	6
	Total	61785	49	37	8	6
5	A	12960	48	38	8	6
	B	12818	49	39	7	5
	C	12715	49	38	8	6
	D	12554	48	38	8	6
	E	12426	49	38	8	6
	Total	63473	49	38	8	6
6	A	13242	47	39	8	5
	B	13000	48	39	8	5
	C	12916	48	40	7	6
	D	12828	47	40	7	6
	E	12764	47	40	7	6
	Total	64750	48	40	7	5
7	A	13429	48	40	7	5
	B	13249	48	40	7	5
	C	13113	48	39	7	5
	D	13047	48	40	7	5
	E	12991	48	39	7	5
	Total	65829	48	40	7	5
8	A	13802	48	40	7	5
	B	13593	50	39	7	5
	C	13533	49	39	7	5
	D	13440	49	39	7	5
	E	13372	49	39	7	6
	Total	67740	49	39	7	5

\* Because percentages are rounded to whole numbers, some rows may not sum to 100.

\*\*Students of unspecified ethnicity are not included in this table.

Table 4  
2006 MSA Student Gender by Grade Level and Test Form\*

Grade	Test Form	Number of Students**	Percent Male	Percent Female
3	A	12388	53	47
	B	12213	52	48
	C	12087	51	49
	D	11907	51	49
	E	11793	50	50
	Total	60388	51	49
4	A	12622	52	48
	B	12517	51	49
	C	12337	51	49
	D	12257	50	50
	E	12052	51	49
	Total	61785	51	49
5	A	12960	52	48
	B	12818	51	49
	C	12715	51	49
	D	12554	51	49
	E	12426	51	49
	Total	63473	51	49
6	A	13242	53	47
	B	13000	52	48
	C	12916	51	49
	D	12828	51	49
	E	12764	52	48
	Total	64750	52	48
7	A	13429	52	48
	B	13249	51	49
	C	13113	51	49
	D	13047	51	49
	E	12991	51	49
	Total	65829	51	49
8	A	13802	52	48
	B	13593	52	48
	C	13533	51	49
	D	13440	51	49
	E	13372	52	48
	Total	67740	52	48

\*Students who did not specify gender are not included in this table.