



Oregon Department of Education

2009–2010

**Extended Mathematics Assessment
Technical Report**

Oregon's Alternate Assessment System

Development • Implementation

Descriptive Statistics • Reliability

Mathematics Standard Setting

It is the policy of the State Board of Education and a priority of the Oregon Department of Education that there will be no discrimination or harassment on the grounds of race, color, sex, marital status, religion, national origin, age or handicap in any educational programs, activities, or employment. Persons having questions about equal opportunity and nondiscrimination should contact the State Superintendent of Public Instruction at the Oregon Department of Education.

Office of Assessment & Information Services
Oregon Department of Education
255 Capitol Street NE
Salem, OR 97310
(503) 947-5600



Susan Castillo
State Superintendent of Public Instruction

Doug Kosty
Assistant Superintendent

Tony Alpert
Director, Assessment and Evaluation

Steve Slater
Manager, Scoring, Psychometrics and Validity

Kathleen Vanderwall
Manager, Test Design and Administration

Holly Carter
Assessment Operations and Policy Analyst

Ken Hermens
Language Arts Assessment Specialist

Leslie Phillips
Science and Social Sciences Assessment Specialist

James Leigh
Mathematics Assessment Specialist

Dianna Carrizales
Director, Monitoring, Systems, and Outcomes

Bradley J. Lenhardt
Education Specialist, Assessment and Monitoring

Sheila Somerville
Electronic Publishing Specialist

Kathy Busby
Project Manager

This technical report is one of a series that describes the development of Oregon's Statewide Assessment System. The complete set of volumes provides comprehensive documentation of the development, procedures, technical adequacy, and results of the system. Oregon's Alternate Assessment System Technical Report: Volume 7, last updated on October 22, 2008.

CONTENTS

Chapter 1 – Test Development	1
Overview of Tasks and Items	1
Development and Alignment of New Mathematics Items	1
Chapter 2 – Training and Implementation	2
Training in Administration of Tests	2
Regional Qualified Trainer Training	2
Qualified Trainer/Assessor Expectations 2009-2010	2
Extended Assessment Changes from 2008-09 to 2009-10	3
Test Administrator Training Proficiency Results.....	6
Training Website Proficiencies.....	6
Website Statistics.....	8
Chapter 3 – Descriptive Statistics for Extended Assessment	9
Reading	9
Writing	11
Mathematics – Operational Tasks	13
Science	15
Pre-requisite Skills – Reading, Writing, Mathematics, and Science	17
Chapter 4 – Reliability: Task Titles and Coefficients	23
Reading	24
Writing	24
Mathematics – Operational Tasks	25
Science	26
Chapter 5 – Mathematics Standard Setting	27

APPENDIX FILE NAMES

Alignment Study in Mathematics

Ex10App1_1AlignmentMathematics.pdf

Training Web Use Statistics

Ex10App2_1WebsiteStatistics.pdf

Item Level Statistics

Ex10App3-1ReadingItemStats.pdf

Ex10App3-2WritingItemStats.pdf

Ex10App3-3MathFieldItemStats.pdf

Ex10App3-4ScienceItemStats.pdf

Task Reliability Coefficients

Ex10App4_1ReadingReliability.pdf

Ex10App4_2WritingReliability.pdf

Ex10App4_3MathOTReliability.pdf¹

Ex10App4_4MathFTReliability.pdf²

Ex10App4_5ScienceReliability.pdf

Ex10App5_MthStdEvalOutcomes.pdf

¹ OT=Operational Test

² FT=Field Test

Chapter 1 - Test Development

1.1 Overview of Tasks and Items

Oregon's alternate assessment, the Extended Assessment, was organized into three grade levels: Elementary (grades 3-5), Middle School (grades 6 - 8), and High School (grade 10). For each grade level of the assessment, the materials include two booklets for each test administration: (a) the student materials and (b) the scoring and recording protocols. Also, two administration formats were provided for each grade level: Standard Administration and Scaffold Administration.

Four subject areas have been developed for the Extended Assessment: Reading, Writing, Mathematics, and Science. Within each of these subject areas, and consistently across both formats – Standard and Scaffold – each test begins with a "Prerequisite Skills" (Task 1) followed by 10 content-level Tasks referred to as the "Content Prompts". Each Content Prompt Task consists of 5 test items, therefore a total of 50 content prompt test items comprise each Extended Assessment.

1.2 Development and Alignment of New Mathematics Items

Until 2009-2010, Oregon's Extended Assessment for mathematics was a grade-band assessment. By vertically aligning the standards across grades, development of assessment items was based on content that was common across grades within a band of grades and scores were scaled based on student ability and item difficulty by grade. In 2009-2010, following Oregon's 2007 adoption of new math standards for grades 3 - 8, Behavioral Research and Teaching (BRT) was commissioned to develop new items for the Extended Assessment. In light of the changes to the standards, mathematics field test items were written for each of these six grades, with two field test items written for each standard at each grade. In addition to this change to the development of items at each of the assessed grade levels, development was also adjusted to account for the assessment of students in the 11th grade instead of in the 10th grade as in previous years.

A multi-stage developmental process was used to: (a) write items, (b) provide an internal review by BRT researchers, (c) conduct an external item review by Mathematics experts, (d) complete an alignment study, and (e) revise items one final time before placing them in the field test.

BRT found that the results from the alignment study confirm that all mathematics field test items for grades 3 - 8 are aligned to Oregon's Mathematics content standards, adopted 2007. A comprehensive document detailing the development and consequence alignment of the Mathematics field test items is available in Appendix 1_1 Alignment of Mathematics Items.

<See Appendix 1_1 Alignment of Mathematics Items>

Chapter 2 - Training and Implementation

2.1 Training in Administration of Tests

Training of personnel to administer the Oregon Extended Assessment was a similar process as used previously. Teachers, Speech Pathologists, School Psychologists, and Administrators are eligible to become a Qualified Assessor (QA) or a Qualified Trainer (QT). New QAs were required to attend a live training by a QT. The QT is usually someone with the QA's school district, or from an ESD (Education Service District). The usual amount of time devoted to this "live" training was 4 hours. The new QA must also go through website training on the Oregon Extended Assessment Training and Proficiency website (<http://or.k12test.com/>), as well as pass five online proficiencies. Returning QAs were required to pass an online refresher proficiency consisting of 25 questions. Returning QTs also were required to pass the online refresher proficiency. Data from the online proficiencies is discussed in section 2.1.3.

2.1.1 Regional Qualified Trainer Trainings

New Qualified Trainers were trained at one of five regional trainings in November of the test year. The information on participants and locations is summarized in the table below.

Date	Location	Qualified Trainers Trained
11/05/2009	Northwest Regional ESD – Hillsboro, Oregon	17
11/13/2009	Willamette ESD - Salem, Oregon	14
11/17/2009	High Desert ESD - Redmond, Oregon (via video conference)	2
11/17/2009	Southern Oregon ESD - Medford, Oregon (via video conference)	2
11/19/2009	Umatilla-Morrow ESD - Pendleton, Oregon	12

2.1.2 Qualified Trainer/Assessor Expectations

Background: To administer Extended Assessments to students in the state of Oregon, educators must be appropriately trained as either a Qualified Assessor of the Extended Assessments or a Qualified Trainer of the Extended Assessments.

Educators who are trained in the process of administering the Extended Assessments to students are referred to as Qualified Assessors (QAs). Educators who are trained to administer the assessments as well as to train others in the administration of the assessments are referred to as Qualified Trainers (QTs).

Qualified ASSESSOR Expectations (Administering tests):

- Prepare materials (monitor materials preparation) and setting for individual administration of the Extended Assessment
- Administer assessments directly to students
- Score student responses
- Maintain Qualified Assessor status through updates and refreshers
- Maintain security status through District Security Administrator
- Enter scores in the state's online data entry system

- Interpret results for student, family, or educational team

Qualified TRAINER Expectations (Training):

- Train new Assessors who have no familiarity with the system/assessment
- Provide training and coaching, if necessary, in the form of updates and refreshers to current Assessors
- Maintain awareness of updates and changes by attending state-supported networking sessions, Video Conferences, and monitoring the website
- Contact ODE with questions, concerns, and/or suggestions from the field regarding the assessment/expectations
- Serve as the local "point" person between ODE and district/ESD
- Maintain awareness of Qualified Assessors within your district/s/ESDs
- Find host location where they can set up local trainings (if necessary)
- Advertise scheduled trainings and/or their availability to provide trainings
- Work with local district administrators to determine administrative details to support the trainings including: (a) Substitute time, (b) Number of Assessors needed in the area, (c) Supports necessary (copying etc), and (d) Prepare any additional supporting documentation (handouts with district specific information for potential Assessors)

2.1.3 Extended Assessment Changes from Prior to Current Test Administration

The following changes to the assessments from the previous test administration year were provided to all test administrators via the training website.

1) Assessments and Materials

- The assessments and materials were updated with additional operational items and field test items.
- With the exception of changes to the math content standards, no significant changes to the assessments were made this year.
- The development and administration of Math Field Test items for grades 3 - 8 (see Item 5 below) were new for this year.

2) Data Entry

- Similar to last year, trained educators entered the student scores into the online data entry and data collection system.
 - These scores were processed for AYP reporting
- Includes new fields for Math Field Test items for grades 3 - 8 (see Item 5 below)

3) Training

- Web training and proficiency training continued for all users.
- As in prior years, returning Qualified Assessors (QA) or Qualified Trainers (QT) (from the prior test administration) were updated via the Training and Proficiency website and achieved status by passing the Refresher Proficiency.
- Individuals with the necessary permission(s) from their district to become QAs for the current school year attended trainings under the supervision of a QT and then accessed the five Proficiencies online necessary for qualification.
- Those who were previously QAs and have received permission from their district to become QTs for the current school year receive training from State Trainers at one of the regional trainings provided by state-level trainers. Users who were a QA or QT in previous years, but did not retain their status in the immediately prior test administration year, must retake and pass the Proficiency assessments for each of the areas (Administration, Reading, Math, Writing, Science).
- Qualified Trainers may schedule trainings to train new QAs once they are trained.
- Districts receive state-level funding to support extended assessment efforts and maintain capacity to provide for valid and reliable administration.

4) Testing window

- Continues to occur in the spring between the middle of February and the end of April.

5) Math Field Test Items Grades 3 - 8

For the current school year, there will be Math Field Test items in each of grades 3 - 8. There will be 8 tasks per grade. Each student in grades 3 - 8 is asked to take only one Task. Each Task will consist of 3, 4, or 5 items. The task a student takes is based on their grade and is determined by the Assessor's first letter of their last name. See the chart below to determine which task the student should take based on the Assessor's last name. This chart was also placed on the ODE District Secure data entry website. **EXAMPLE:** An Assessor with the last name of JONES will first administer all 11 tasks of the operational Extended Math assessment based on the student's grade within Elementary, Middle or High, BUT will also administer Task 4 of the Math Field Test to each of his or her students in grades 3 - 8. There will be no separate Math Field Test items for High School: High school students (grade 10) will take the regular Extended Assessment Math test.

PLEASE BE SURE THAT THE TASK NUMBER PAGE YOU ENTER INFORMATION ONTO MANUALLY MATCHES THE TASK YOU ARE ADMINISTERING TO THE STUDENT.

TASK 1	TASK 1
<p>Extended Assessment Math FIELD TEST</p> <p>Grade X: TASK 1</p> <p>(Print for Teacher last name A - B)</p>	

Grade	Task 1 Teachers A-B		Task 2 Teachers C-D		Task 3 Teachers E-G		Task 4 Teachers H-K		Task 5 Teachers L-M		Task 6 Teachers N-R		Task 7 Teachers S		Task 8 Teachers T-Z	
	Std	Scf	Std	Scf	Std	Scf	Std	Scf	Std	Scf	Std	Scf	Std	Scf	Std	Scf
3																
4																
5																
6																
7																
8																

Task Number of Math Field Test	Initial of Assessor's Last Name
1	A & B
2	C & D
3	E, F, G
4	H, I, J, K
5	L & M
6	N, O, P, R
7	S
8	T, U, V, W, X, Y, Z

Scoring - The Math Field Test Items will have the same scoring options as in the past, D, I, 0, 1, and 2. The correct 2 point answer is given in the Scoring Protocol, and though a 1 point response is not provided, the Assessor still has the option to give a student 1 point. One point can be awarded if the Assessor felt that the student was generally correct, but the response lacked a full demonstration of the item's purpose OR the student answered one part of a two part question correctly OR the student was on the right track towards the answer OR the student was on the right track to accuracy, but made a minor error that impacted his/her final response. The 1-point award is also possible to allow for variances in the verbal responses students may provide.

Data Entry- For the Math Field Test items data entry will be located just below the data entry for the four existing operational assessments on the ODE secure website. The format and functionality for entering field test data will be similar to data entry for the regular Extended Assessment test items. PLEASE BE SURE TO ENTER THE DATA IN THE CORRECTLY NUMBERED TASK AND GRADE LEVEL FOR EACH STUDENT AND/OR TO NOTIFY ANYONE RESPONSIBLE FOR DATA ENTRY OF THESE EXPECTATIONS.

2.2 Test Administrator Training Proficiency Results

2.2.1 Training Website Proficiencies

The tables below contain data from the Oregon Extended Assessment Training and Proficiency Website (<http://or.k12test.com/>). This website is a component of a training that all intended QAs or QTs are expected to attend. There are primarily two levels of assessors, a Qualified Assessor (QA) and a Qualified Trainer (QT). All assessors need to complete some form of training each year to retain their status for administering the Extended Assessments. Assessors who completed all training during the 2008-09 school year successfully passed (score of 80% or higher) each of five proficiencies on the website. These five proficiencies were in Administration, Reading Math, Writing, and Science. Returning QAs or QTs for the 2009-10 school year only needed to take a Refresher Proficiency. New assessors, or returning assessors who wanted further training again in 2009-10 needed to pass the five proficiencies. The tables below contain data on the number of assessors (participants) in each of the five proficiencies, as well as the Refresher Proficiency. Included in the data is the number of attempts needed to attain a passing score as well as the average passing score of the participants.

The number of assessors on the Oregon Extended Assessment Training and Proficiency Website:

Assessor in-Training - 494

Qualified Assessors - 1,187

Qualified Trainers - 190

383 Test Participants – Administration Proficiency

Number of Participants	Percentage of Participants	Attempts to Pass	Average Passing Score
304	80%	1	91%
50	13%	2	89%
25	6%	3	93%
2	1%	4	93%
1	>1%	6	100%
1	>1%	7	100%

Clearly, the vast majority of test administrators (93%) reach proficiency within the first two administrations. This is true for test administration as well as for each of the subject area assessments that are reported on the next two pages: in reading and writing, 96%; in mathematics, 97%; in science, 99%; finally, in refresher assessments, 96%.

376 Test Participants – Reading Proficiency

Number of Participants	Percentage of Participants	Attempts to Pass	Average Passing Score
348	93%	1	94%
13	3%	2	87%
13	3%	3	97%
2	1%	4	93%

365 Test Participants – Writing Proficiency

Number of Participants	Percentage of Participants	Attempts to Pass	Average Passing Score
334	91%	1	91%
18	5%	2	88%
10	3%	3	88%
3	1%	4	85%

373 Test Participants – Math Proficiency

Number of Participants	Percentage of Participants	Attempts to Pass	Average Passing Score
308	82%	1	91%
57	15%	2	93%
6	2%	3	89%
1	>1%	4	80%
1	>1%	5	90%

362 Test Participants – Science Proficiency

Number of Participants	Percentage of Participants	Attempts to Pass	Average Passing Score
317	87%	1	93%
43	12%	2	90%
2	1%	3	90%

1,018 Test Participants – Refresher Proficiency

Number of Participants	Percentage of Participants	Attempts to Pass	Average Passing Score
927	92%	1	93%
49	4%	2	86%
38	3%	3	93%
2	>1%	4	90%
2	>1%	5	92%

An additional analysis was compiled which compared the average score of participants on their first attempt at proficiency to the final passing score of the proficiency subject area. All final attempt average scores were higher than attempt one average scores.

Comparison of Attempt One Scores to Passing Score on Final Attempt

Subject	Attempt 1 Average Score	Number of Participants	Final Attempt Passing Score	Number of Participants
Administration	85%	394	91%	383
Reading	91%	383	94%	376
Math	87%	375	91%	373
Writing	89%	369	91%	365
Science	90%	365	93%	362
Refresher	91%	1,022	93%	1,018

2.2.2 Website Statistics

The Oregon Extended Assessment Training and Proficiency Website was open to train assessors from November 10, 2009 to June 3, 2010. There were a total of 10,392 site visits during this period while 125,550 pages were viewed. The site was used most heavily during the months of January and February 2010. For complete website statistics see the appendix listed below.

<See Appendix 2_1 Website Statistics>

Chapter 3 – Descriptive Statistics for Extended Assessments

The reading test raw score total is 100 points; the average for all students in each of the grade bands was about 2/3 of the total; the standard deviation (SD) was less than half of the mean, reflecting an appropriate amount of variation for a broad band measure. However, as a criterion-referenced measure, the distribution should be more skewed with more students reflecting mastery and therefore the SD actually quite small (relative to the mean). *See Appendix 3-0 for participation rates by grade broken down by gender, ethnicity, and administration type.*

Reading Total Test Score in Grade Band = 345

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
totalcnt	3114	0	100	68.66	28.358

Reading Total Test Score in Grade Band = 678

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
totalcnt	1940	0	100	63.86	32.606

Reading Total Test Score in Grade Band = 910

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
totalcnt	496	0	98	59.45	33.458

The average for each subtest for grade bands was over 2/3 of the total with the SD less than half the value of the mean. In all grade bands, the minimum score was 0 and the maximum score was the highest possible value.

Reading Total Task Scores in Grade Band = 345

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
t1total	3136	0	40	36.40	6.752
t2total	3091	0	10	7.42	3.197
t3total	2984	0	10	7.46	3.219
t4total	2942	0	10	6.75	2.968
t5total	2926	0	10	7.42	2.713
t6total	2902	0	10	8.02	2.419
t7total	2865	0	10	8.01	2.438
t8total	2833	0	10	7.35	2.700
t9total	2832	0	10	7.58	2.657
t10total	2817	0	10	6.63	2.847
t11total	2815	0	10	7.05	2.628
Valid N (listwise)	2742				

Reading Total Task Scores in Grade Band = 678

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
t1total	1957	0	40	35.84	7.958
t2total	1932	0	10	7.21	3.187
t3total	1926	0	10	6.59	3.857
t4total	1778	0	10	6.75	3.355
t5total	1724	0	10	7.33	2.827
t6total	1694	0	10	6.96	2.590
t7total	1677	0	10	7.16	2.755
t8total	1664	0	10	7.47	2.679
t9total	1656	0	10	7.81	2.773
t10total	1656	0	10	7.37	2.784
t11total	1651	0	10	6.84	2.656
Valid N (listwise)	1637				

Reading Total Task Scores in Grade Band = 910

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
t1total	504	0	40	35.72	8.105
t2total	495	0	10	6.36	2.903
t3total	495	0	10	6.22	3.935
t4total	456	0	10	6.51	3.510
t5total	436	0	10	6.37	3.144
t6total	425	0	10	7.71	3.187
t7total	420	0	10	6.90	2.911
t8total	418	0	10	7.43	3.086
t9total	418	0	10	7.28	3.077
t10total	418	0	10	6.60	2.927
t11total	417	0	10	5.83	2.739
Valid N (listwise)	415				

< See Appendix for Chapter 3-1: Reading Item Descriptive Statistics >

Writing Total Test Score in Grade Band = 345**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
totalcnt	1016	0	98	50.82	27.918
Valid N (listwise)	1016				

Writing Total Test Score in Grade Band = 678**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
totalcnt	658	0	100	50.87	31.002
Valid N (listwise)	658				

Writing Total Test Score in Grade Band = 910**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
totalcnt	502	0	98	50.89	32.472
Valid N (listwise)	502				

Writing Total Task Scores in Grade Band = 345**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
t1total	1029	0	40	36.76	7.296
t2total	1009	0	10	7.51	3.351
t3total	992	0	10	6.97	3.512
t4total	940	0	10	6.30	2.728
t5total	901	0	10	7.22	2.906
t6total	883	0	10	5.94	2.810
t7total	879	0	10	5.01	3.402
t8total	852	0	10	4.72	3.280
t9total	835	0	10	3.56	3.114
t10total	815	0	10	3.06	2.926
t11total	829	0	10	6.73	3.377
Valid N (listwise)	805				

Writing Total Task Scores in Grade Band = 678**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
t1total	675	0	40	35.65	8.896
t2total	637	0	10	6.87	3.646
t3total	650	0	10	6.30	3.221
t4total	598	0	10	6.76	2.903
t5total	560	0	10	6.91	2.920
t6total	543	0	10	4.99	3.193
t7total	540	0	10	5.74	3.473
t8total	508	0	10	5.00	3.519
t9total	496	0	10	5.09	3.413
t10total	505	0	10	5.92	3.053
t11total	505	0	10	6.38	3.521
Valid N (listwise)	486				

Writing Total Task Scores in Grade Band = 910**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
t1total	510	0	40	36.33	8.130
t2total	492	0	10	7.19	3.665
t3total	497	0	10	5.80	3.514
t4total	456	0	10	5.41	2.984
t5total	436	0	10	7.17	3.212
t6total	424	0	10	5.01	3.372
t7total	410	0	10	5.74	3.557
t8total	399	0	10	4.60	3.594
t9total	400	0	10	5.36	3.595
t10total	399	0	10	6.36	3.423
t11total	395	0	10	6.43	3.642
Valid N (listwise)	385				

< See Appendix for Chapter 3-2: Writing Item Descriptive Statistics >

Mathematics Total Test Score in Grade Band = 345**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
totalcnt	2656	0	99	48.62	25.303
Valid N (listwise)	2656				

Mathematics Total Test Score in Grade Band = 678**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
totalcnt	1874	0	98	39.42	24.602
Valid N (listwise)	1874				

Mathematics Total Test Score in Grade Band = 910**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
totalcnt	523	0	97	40.67	26.057
Valid N (listwise)	523				

Mathematics Total Task Scores in Grade Band = 345**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
t1total	2677	0	40	36.53	7.154
t2total	2623	0	10	4.86	2.759
t3total	2613	0	10	4.07	2.807
t4total	2463	0	10	5.32	2.469
t5total	2411	0	10	6.33	2.737
t6total	2393	0	10	6.26	2.818
t7total	2359	0	10	6.05	2.664
t8total	2345	0	10	6.07	2.797
t9total	2330	0	10	5.11	2.647
t10total	2317	0	10	5.42	2.639
t11total	2299	0	10	4.11	2.521
Valid N (listwise)	2283				

Mathematics Total Task Scores in Grade Band = 678

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
t1total	1886	0	40	36.33	7.869
t2total	1856	0	10	3.62	2.707
t3total	1843	0	10	3.19	2.423
t4total	1676	0	10	4.73	2.769
t5total	1610	0	10	5.39	2.926
t6total	1551	0	10	4.51	2.701
t7total	1548	0	10	4.32	2.711
t8total	1521	0	10	4.68	2.606
t9total	1504	0	10	4.69	2.677
t10total	1508	0	10	4.82	2.792
t11total	1502	0	10	6.36	3.024
Valid N (listwise)	1474				

Mathematics Total Task Scores in Grade Band = 910

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
t1total	528	0	40	36.25	8.045
t2total	518	0	10	4.99	2.892
t3total	519	0	10	3.38	2.752
t4total	468	0	10	6.06	3.076
t5total	449	0	10	4.65	2.646
t6total	440	0	10	5.69	2.933
t7total	437	0	10	4.21	2.854
t8total	433	0	10	4.22	2.938
t9total	431	0	10	5.12	3.132
t10total	428	0	10	3.89	2.553
t11total	427	0	10	4.60	3.031
Valid N (listwise)	423				

< See Appendix for Chapter 3-3a and 3-3b: Mathematics Operational and Field Test Item Descriptive Statistics >

Science Total Test Score in Grade Band = 345**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
totalcnt	663	0	100	70.96	30.614
Valid N (listwise)	663				

Science Total Test Score in Grade Band = 678**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
totalcnt	508	0	100	60.54	29.746
Valid N (listwise)	508				

Science Total Test Score in Grade Band = 910**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
totalcnt	499	0	96	52.41	28.607
Valid N (listwise)	499				

Science Total Task Scores in Grade Band = 345**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
t1total	671	3	40	37.26	7.036
t2total	659	0	10	7.31	2.978
t3total	649	0	10	7.37	3.234
t4total	628	0	10	7.41	2.992
t5total	609	0	10	8.43	2.616
t6total	609	0	10	8.20	2.803
t7total	588	0	10	8.42	2.366
t8total	588	0	10	6.79	2.682
t9total	586	0	10	8.50	2.713
t10total	582	0	10	6.91	2.945
t11total	581	0	10	8.14	2.523
Valid N (listwise)	574				

Science Total Task Scores in Grade Band = 678

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
t1total	509	2	40	37.39	7.173
t2total	507	0	10	6.45	3.040
t3total	506	0	10	7.32	3.145
t4total	468	0	10	6.69	2.898
t5total	450	0	10	5.82	2.592
t6total	444	0	10	5.65	2.914
t7total	438	0	10	6.90	3.046
t8total	435	0	10	7.68	2.607
t9total	436	0	10	7.42	3.175
t10total	434	0	10	6.19	3.007
t11total	434	0	10	7.48	2.544
Valid N (listwise)	427				

Science Total Task Scores in Grade Band = 910

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
t1total	505	1	40	37.18	7.365
t2total	497	0	10	6.32	2.975
t3total	498	0	10	6.02	3.307
t4total	466	0	10	5.39	3.031
t5total	444	0	10	6.09	2.996
t6total	436	0	10	4.89	2.939
t7total	430	0	10	5.35	3.011
t8total	422	0	10	7.58	3.201
t9total	421	0	10	5.81	3.008
t10total	422	0	10	4.74	2.660
t11total	420	0	10	6.50	3.253
Valid N (listwise)	416				

< See Appendix for Chapter 3-4: Science Item Descriptive Statistics >

Reading Item Totals for Pre-requisite Skills in Grade Band = 345**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
t1r1	3129	0	4	3.88	.499
t1r2	3135	0	4	3.86	.552
t1r3	3120	0	4	3.74	.734
t1r4	3096	0	4	3.67	.781
t1r5	3119	0	4	3.77	.704
t1r6	3117	0	4	3.74	.749
t1r7	3113	0	4	3.49	.883
t1r8	3115	0	4	3.56	.825
t1r9	3116	0	4	3.54	.866
t1r10	3112	0	4	3.35	.909
Valid N (listwise)	3080				

Reading Item Totals for Pre-requisite Skills in Grade Band = 678**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
t1r1	1952	0	4	3.85	.589
t1r2	1954	0	4	3.79	.714
t1r3	1945	0	4	3.71	.793
t1r4	1912	0	4	3.62	.877
t1r5	1939	0	4	3.71	.823
t1r6	1942	0	4	3.68	.860
t1r7	1937	0	4	3.49	.944
t1r8	1936	0	4	3.53	.908
t1r9	1936	0	4	3.47	.956
t1r10	1934	0	4	3.34	.982
Valid N (listwise)	1898				

Reading Item Totals for Pre-requisite Skills in Grade Band = 910**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
t1r1	504	0	4	3.86	.592
t1r2	500	0	4	3.79	.687
t1r3	495	0	4	3.71	.781
t1r4	491	0	4	3.62	.862
t1r5	494	0	4	3.77	.727
t1r6	495	0	4	3.70	.824
t1r7	492	0	4	3.54	.896
t1r8	493	0	4	3.59	.830
t1r9	490	0	4	3.47	.955
t1r10	489	0	4	3.35	.986
Valid N (listwise)	484				

Writing Item Totals for Pre-requisite Skills in Grade Band = 345**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
t1r1	1028	0	4	3.86	.561
t1r2	1029	0	4	3.83	.629
t1r3	1029	0	4	3.83	.624
t1r4	1025	0	4	3.82	.664
t1r5	1021	0	4	3.62	.861
t1r6	1021	0	4	3.69	.821
t1r7	1016	0	4	3.63	.905
t1r8	1017	0	4	3.53	.995
t1r9	1020	0	4	3.56	.912
t1r10	1020	0	4	3.62	.890
Valid N (listwise)	1013				

Writing Item Totals for Pre-requisite Skills in Grade Band = 678**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
t1r1	671	0	4	3.85	.593
t1r2	674	0	4	3.73	.804
t1r3	672	0	4	3.74	.793
t1r4	667	0	4	3.70	.853
t1r5	664	0	4	3.51	1.004
t1r6	664	0	4	3.62	.926
t1r7	648	0	4	3.57	1.009
t1r8	648	0	4	3.48	1.078
t1r9	662	0	4	3.54	.974
t1r10	663	0	4	3.53	1.017
Valid N (listwise)	644				

Writing Item Totals for Pre-requisite Skills in Grade Band = 910**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
t1r1	509	0	4	3.86	.602
t1r2	506	0	4	3.83	.640
t1r3	506	0	4	3.81	.682
t1r4	502	0	4	3.79	.708
t1r5	497	0	4	3.60	.888
t1r6	498	0	4	3.69	.830
t1r7	497	0	4	3.60	.981
t1r8	495	0	4	3.53	1.035
t1r9	499	0	4	3.62	.873
t1r10	500	0	4	3.66	.854
Valid N (listwise)	491				

Mathematics Item Totals for Pre-requisite Skills in Grade Band = 345**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
t1r1	2672	0	4	3.87	.518
t1r2	2675	0	4	3.82	.623
t1r3	2661	0	4	3.74	.771
t1r4	2656	0	4	3.75	.752
t1r5	2651	0	4	3.51	.947
t1r6	2659	0	4	3.66	.830
t1r7	2658	0	4	3.76	.739
t1r8	2659	0	4	3.71	.788
t1r9	2654	0	4	3.50	.877
t1r10	2651	0	4	3.44	.902
Valid N (listwise)	2632				

Mathematics Item Totals for Pre-requisite Skills in Grade Band = 678**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
t1r1	1880	0	4	3.85	.579
t1r2	1881	0	4	3.78	.709
t1r3	1877	0	4	3.71	.827
t1r4	1874	0	4	3.72	.809
t1r5	1866	0	4	3.48	1.006
t1r6	1872	0	4	3.64	.886
t1r7	1871	0	4	3.73	.807
t1r8	1869	0	4	3.68	.855
t1r9	1862	0	4	3.54	.903
t1r10	1865	0	4	3.48	.942
Valid N (listwise)	1846				

Mathematics Item Totals for Pre-requisite Skills in Grade Band = 910**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
t1r1	515	0	4	3.86	.574
t1r2	513	0	4	3.81	.688
t1r3	510	0	4	3.72	.806
t1r4	510	0	4	3.73	.803
t1r5	509	0	4	3.49	1.021
t1r6	509	0	4	3.65	.868
t1r7	509	0	4	3.76	.758
t1r8	509	0	4	3.68	.861
t1r9	507	0	4	3.56	.899
t1r10	505	0	4	3.44	1.000
Valid N (listwise)	501				

Science Item Totals for Pre-requisite Skills in Grade Band = 345**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
t1r1	667	1	4	3.88	.453
t1r2	671	1	4	3.82	.642
t1r3	669	1	4	3.74	.762
t1r4	666	0	4	3.73	.776
t1r5	666	0	4	3.75	.744
t1r6	666	0	4	3.76	.736
t1r7	666	0	4	3.72	.761
t1r8	666	0	4	3.75	.749
t1r9	665	0	4	3.68	.816
t1r10	665	0	4	3.68	.822
Valid N (listwise)	662				

Science Item Totals for Pre-requisite Skills in Grade Band = 678**Descriptive Statistics^a**

	N	Minimum	Maximum	Mean	Std. Deviation
t1r1	509	0	4	3.87	.554
t1r2	509	0	4	3.77	.734
t1r3	508	0	4	3.70	.788
t1r4	507	0	4	3.74	.788
t1r5	507	0	4	3.78	.736
t1r6	507	0	4	3.75	.758
t1r7	507	0	4	3.71	.808
t1r8	507	0	4	3.77	.762
t1r9	507	1	4	3.72	.777
t1r10	507	0	4	3.69	.847
Valid N (listwise)	507				

Science Item Totals for Pre-requisite Skills in Grade Band = 910**Descriptive Statistics^a**

	N	Minimum	Maximum	Mean	Std. Deviation
t1r1	504	1	4	3.89	.490
t1r2	501	0	4	3.82	.652
t1r3	499	1	4	3.74	.719
t1r4	498	0	4	3.75	.739
t1r5	498	0	4	3.77	.732
t1r6	498	0	4	3.80	.681
t1r7	498	0	4	3.74	.738
t1r8	497	0	4	3.77	.713
t1r9	496	0	4	3.70	.784
t1r10	495	0	4	3.70	.795
Valid N (listwise)	493				

Chapter 4 – Reliability of Extended Assessments

For each grade band and subject area, Cronbach’s alpha was calculated with the statistical tables displayed in the appendix noted at the end of this section. Following is a summary table of the coefficients for the total test. These coefficients are the most important as the decision for Adequate Yearly Progress are made from this level of test information.

	Reading	Writing	Mathematics	Science
Elementary	.96 (n=2,725)	.97 (n=799)	.94 (n=2,240)	.96 (n=574)
Middle	.97 (n=1,627)	.97 (n=483)	.92 (n=1,457)	.95 (n=427)
High	.98 (n=409)	.98 (n=381)	.940 (n=419)	.94 (n=416)

In addition to total test reliability, individual task reliabilities were computed, primarily for purposes of improving the test. Following are the coefficients for each grade band and subject area. Note that in mathematics, we divided the task coefficients into those computed for operational versus field test.

Reading Task Titles

Task	Elementary	Middle	High
One	Decoding and Word Recognition	Vocabulary (contextual clues, figurative language)	Vocabulary (contextual clues, figurative language)
Two	Decoding and Reading Fluency	Read to Perform a Task (locate and synthesize info)	Read to Perform a Task (locate and synthesize information)
Three	Word Recognition and Vocabulary	Read to Perform a Task: Charts and Tables	Read to Perform a Task: Charts and Tables
Four	Vocabulary (synonyms/antonyms, homophones, context)	Informational Text: General Understanding; Interpretation	Informational Text: General Understanding; Interpretation
Five	Read to Perform a Task; Informational Text: General	Literary Text: General Understanding; Interpretation	Literary Text: General Understanding; Interpretation
Six	Literary Text: General Understanding; Interpretation	Literary Text: General Understanding; Interpretation	Literary Text: Examine Content and Structure
Seven	Informational Text: General Understanding; Content	Informational Text: Examine Content and Structure	Informational Text: Examine Content and Structure
Eight	Literary Text: General Understanding; Interpretation	Literary Text: General Understanding; Interpretation	Literary Text: General Understanding; Interpretation
Nine	Read to Perform a Task; Informational Text: Interpretation	Literary Text: General Understanding; Interpretation	Literary Text: General Understanding; Interpretation
Ten	Informational Text: General Understanding; Interpretation	Informational Text: Examine Content and Structure	Literary Text: Examine Content and Structure

Reading Task Reliability Coefficients

Task	Elementary	Middle	High
One	.91 (n=3087)	.84 (n=1929)	.77 (n=493)
Two	.95 (n=2979)	.92 (n=1926)	.92 (n=491)
Three	.80 (n=2936)	.86 (1774)	.90 (n=456)
Four	.64 (n=.67)	.80 (1720)	.87 (436)
Five	.76 (n=2897)	.76 (n=1693)	.89 (n=423)
Six	.75 (n=2862)	.76 (n=1675)	.82 (n=419)
Seven	.76 (n=2830)	.80 (n=1663)	.87 (n=417)
Eight	.73 (n=2830)	.811 (n=1656)	.88 (n=417)
Nine	.69 (n=2811)	.81 (n=1656)	.83 (n=418)
Ten	.77 (n=2811)	.80 (n=1650)	.83 (n=416)

<See Appendix 4_1 Reading Reliability>

Writing Task Titles

Task	Elementary	Middle	High
One	Handwriting and Spelling	Handwriting and Spelling	Handwriting and Spelling
Two	Writing Sentences	General Conventions	General Conventions
Three	General Conventions	Grammar and Punctuation	Grammar and Composition
Four	Grammar	General Composition	General Composition
Five	Punctuation	Applications	Applications
Six	Purpose and Style	Narrative Writing	Narrative Writing
Seven	Narrative Writing	Persuasive Writing	Persuasive Writing
Eight	Persuasive Writing	Research Writing	Research Writing
Nine	Research Writing	Summary and Job Application	Summary and Job Application
Ten	Letter Writing	Letter Writing	Letter Writing

Writing Task Reliability Coefficients

Task	Elementary	Middle	High
One	.94 (n=1009)	.97 (n=637)	.97 (n=491)
Two	.96 (n=991)	.84 (n=639)	.89 (n=494)
Three	.75 (n=935)	.85 (n=595)	.82 (n=452)
Four	.85 (n=901)	.81 (n=560)	.88 (n=436)
Five	.76 (n=882)	.65 (n=542)	.71 (n=424)
Six	.75 (n=877)	.92 (n=540)	.94 (n=410)
Seven	.91 (n=851)	.91 (n=507)	.93 (n=399)
Eight	.89 (n=834)	.90 (n=496)	.91 (n=400)
Nine	.88 (n=815)	.84 (n=502)	.89 (n=396)
Ten	.89 (n=825)	.90 (n=502)	.92 (n=394)

<See Appendix 4_2 Writing Reliability>

Mathematics Task Titles – Operational Tasks

Task	Elementary	Middle	High
One	Numbers	Calculations: Numbers, Percents, Fractions, and Numbers	Computations and Calculations: Numbers/Estimation
Two	Computation	Calculations: Computations and Operations	Computations and Calculations: Properties/Operation
Three	Measurement: Time/Temperature/Length/Area	Statistics and Probability	Geometry: Shapes/Properties
Four	Geometry/Shapes	Statistic: Collect and Display Data	Statistical Measures and Probabilities
Five	Measurement: Weight/Height/Volume	Algebraic Relationships	Probability (Representation) and Algebra (Patterns)
Six	Interpret Data and Graphs	Measurement: Units, Conversions, and Rates	Algebra: Variables/Equations/Relationships
Seven	Applications	Measurement: Shapes, Angles, and Area	Algebra: Graphing/Change/Distance
Eight	Fractions/Decimals/Number Line	Geometry: Angles and Properties	Measurement: Units/Conversion/Formulas
Nine	Probabilities and Predictions	Geometry: Lines and Shapes	Geometry: Properties/Planes/Lines
Ten	Algebra/Unknown Quantities	Geometry: Reflections, Transformations, and Missing	Geometry: Transformations/Symmetry/Coordinate

Mathematics Task Reliability Coefficients – Operational Tasks

Task	Elementary	Middle	High
One	.66 (n=2606)	.66 (n=1851)	.74 (n=514)
Two	.58 (n=2578)	.53 (n=1837)	.61 (n=516)
Three	.64 (n=2454)	.64 (n=1672)	.72 (n=467)
Four	.69 (n=2407)	.67 (N=1600)	.65 (n=447)
Five	.61 (n=2387)	.60 (n=1546)	.76 (n=440)
Six	.70 (n=2348)	.48 (n=1544)	.64 (n=437)
Seven	.80 (n=2340)	.53 (n=1517)	.63 (n=433)
Eight	.65 (n=2322)	.53 (n=1501)	.70 (n=430)
Nine	.70 (n=2310)	.48 (n=1506)	.60 (n=428)
Ten	.61 (n=2292)	.69 (n=1501)	.64 (n=426)

<See Appendix 4_3 Mathematics Operational Test Reliability>

Mathematics Task Reliability Coefficients – Field Tasks

Task	Elementary	Middle
One	.80 (n=186)	.80 (n=115)
Two	.66 (n=259)	.68 (n=134)
Three	.24 (n=195)	.63 (n=119)
Four	.62 (n=318)	.64 (n=262)
Five	.49 (n=223)	.66 (n=179)
Six	.59 (n=224)	.49 (n=149)
Seven	.49 (n=192)	.46 (n=157)
Eight	.68 (n=203)	.57 (n=192)

<See Appendix 4_4 Mathematics Field Test Reliability for Grade Band and Grade Level >

Science Task Titles

Task	Elementary	Middle	High
One	Structure and Properties of Matter	Changes of State	Changes of State
Two	Chemical and Physical Changes	Force, Mass, and Motion	Force, Mass, and Motion
Three	Fundamental Forces and Motions	Force/Gravity	Force/Gravity
Four	Interaction of Energy and Matter	Types of Energy/Transformations	Types of Energy/Transformations
Five	Organism Characteristics and Needs	Organisms/Structures	Organisms/Structures
Six	Classification, Life Cycle	Energy Flow, Photosynthesis/Organisms	Organisms/Energy Flow
Seven	Interdependence of Organisms in Environment	Heredity	Heredity
Eight	Survival, Structure, Function	Evolution, Selection, and Adaptation	Evolution, Selection, and Adaptation
Nine	Structure of Earth and Material Use	The Dynamic Earth	Earth Science
Ten	Weather and the Solar System	The Earth, Space, and Resources	Earth Science

Science Task Reliability Coefficients

Task	Elementary	Middle	High
One	.74 (n=659)	.69 (n=506)	.67 (n=496)
Two	.83 (n=648)	.80 (506)	.73 (n=497)
Three	.73 (n=628)	.68 (n=467)	.64 (n=465)
Four	.79 (n=609)	.54 (n=450)	.65 (n=442)
wFive	.80 (n=609)	.63 (n=443)	.55 (n=436)
Six	.76 (n=588)	.69 (n=437)	.63 (n=430)
Seven	.61 (n=588)	.69 (n=434)	.81 (n=422)
Eight	.83 (n=586)	.79 (n=436)	.63 (n=421)
Nine	.69 (n=581)	.66 (n=433)	.51 (n=421)
Ten	.72 (n=581)	.61 (n=433)	.73 (n=420)

<See Appendix 4_5 Science Reliability>

Chapter 5 – Mathematics Standard Setting

With the changes noted in the Chapter 1 describing the alignment of newly developed mathematics items to the recently adopted standards, standard setting was updated for grades 3-8, and 10. A full description and an evaluation of the process is presented in Appendix 5.

Elementary School Grades

CUTSCORES (set by panel)

Grade	Does Not Meet	Nearly Meets	Meets	Exceeds
3	—	97.2	104.4	111.6
4	—	97.7	106.3	114.3
5	—	100.6	109.9	118.4

CLASSIFICATION IMPACT (count)

Grade	Does Not Meet	Nearly Meets	Meets	Exceeds	Total	Meets or Exceeds
3	260	271	147	32	710	179
4	195	319	149	29	692	178
5	206	277	138	29	650	167

CLASSIFICATION IMPACT (%)

Grade	Does Not Meet	Nearly Meets	Meets	Exceeds	Total	Meets or Exceeds
3	37%	38%	21%	5%	100%	25%
4	28%	46%	22%	4%	100%	26%
5	32%	43%	21%	4%	100%	26%

Middle School Grades

CUTSCORES (set by panel)

Grade	Does Not Meet	Nearly Meets	Meets	Exceeds
6	—	98.7	103.7	110
7	—	100.6	101.3	106.9
8	—	101	104.5	110.1

CLASSIFICATION IMPACT (count)

Grade	Does Not Meet	Nearly Meets	Meets	Exceeds	Total	Meets or Exceeds
6	308	163	62	16	549	78
7	319	28	108	45	500	153
8	249	100	56	21	426	77

CLASSIFICATION IMPACT (%)

Grade	Does Not Meet	Nearly Meets	Meets	Exceeds	Total	Meets or Exceeds
6	56.10%	29.69%	11.29%	2.91%	100.00%	14.21%
7	63.80%	5.60%	21.60%	9.00%	100.00%	30.60%
8	58.45%	23.47%	13.15%	4.93%	100.00%	18.08%

High School Grades

CUTSCORES (set by panel)

Grade	Does Not Meet	Nearly Meets	Meets	Exceeds
9	—			
10	—	99.1	106	115.4
11	—			
12	—			

CLASSIFICATION IMPACT (count)

Grade	Does Not Meet	Nearly Meets	Meets	Exceeds	Total	Meets or Exceeds
9	—	—	—	—	—	—
10	280	163	63	6	512	69
11	—	—	—	—	—	—
12	—	—	—	—	—	—

CLASSIFICATION IMPACT (%)

Grade	Does Not Meet	Nearly Meets	Meets	Exceeds	Total	Meets or Exceeds
9	—	—	—	—	—	—
10	55%	32%	12%	1%	100%	13%
11	—	—	—	—	—	—
12	—	—	—	—	—	—

<See Appendix 5 Mathematics Standard Setting>