

**SOUTH CAROLINA  
END-OF-COURSE EXAMINATION PROGRAM**

**2012–13 OPERATIONAL TEST TECHNICAL REPORT**



Issued by the  
**South Carolina Department of Education**

**Office of Assessment  
Division of Accountability**

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## **CHAPTER 1**

### **HISTORY AND OVERVIEW**

The South Carolina Education Accountability Act of 1998 requires the administration of end-of-course examinations in gateway courses for which credit in English language arts, mathematics, science, and social studies is awarded. Students must take the appropriate End-of-Course Examination Program (EOCEP) tests if they are enrolled in courses in which the curriculum standards for Algebra 1, Mathematics for the Technologies 2, English 1, Biology 1, Applied Biology 2, and U.S. History and the Constitution are taught.

As they are enunciated in State Board of Education Regulation 43-262.4, the purposes and uses of the EOCEP tests are as follows:

- A. The tests shall promote instruction in the specific academic standards for the courses, encourage student achievement, and document the level of students' mastery of the curriculum standards.
- B. The tests shall serve as indicators of program, school, and school district effectiveness in the manner prescribed by the Education Oversight Committee in accordance with the provisions of the Education Accountability Act of 1998 (EAA).
- C. The tests shall be weighted 20 percent in the determination of students' final grades in the gateway courses.

EOCEP exams are reported on the basis of the South Carolina uniform grading scale (UGS). The score reported is a scale score and not the percentage of correct answers.

The Algebra 1/Mathematics for the Technologies 2 end-of-course examination was implemented in the baseline year 2002–03 and was operational for the first time in 2003–04. The English 1, Physical Science, and Biology 1/Applied Biology 2 examinations that were field-tested in May 2003 were implemented for the baseline year in 2003–04. These subject-area EOCEP examinations became operational in 2004–05. The Biology 1/Applied Biology 2 examination was discontinued after the 2005–06 school year. The State Board of Education reinstated the Biology test with a field test in 2008. Additional field testing was conducted in spring 2009. The 2009–10 school year was an implementation year for Biology. The first operational administration for Biology was fall 2010. The last administration of Physical Science was in spring 2011. The U.S. History and Constitution examination was field-tested in 2005–06, with baseline implementation in 2006–07 and a second implementation in 2007–08. The first operational administration was in 2008–09.

The South Carolina Department of Education (SCDE) awarded the contract for the development and scoring of the EOCEP tests in October 2001 to American Institutes for Research (AIR) and its partners Insite, Inc., and Pearson Educational Measurement (PEM). In spring 2007, Pearson became the sole contractor. In fall 2008, Data Recognition Corporation (DRC) took over administration, while Pearson remained the development contractor. These contractors have undertaken a number of development, review, implementation, and data analysis activities. DRC became the sole contractor in mid-2013.

All EOCEP exams contain only multiple-choice items. Rasch-ability-score-to-scale-score conversion tables were produced prior to each test administration on the basis of the item parameters in the pre-equated item pool. This technical report summarizes the results of statistical and psychometric analyses performed on the current year's operational data.

In this report, all data are based on the students in public middle and high schools or adult education programs only. Data on students in district-approved homeschools have been excluded.

## CHAPTER 2

### STUDENT DEMOGRAPHICS

#### 2.1 STUDENT PARTICIPATION

All schools administered EOCEP tests to students who completed courses, in which the standards for Algebra 1, Mathematics for the Technologies 2, Biology 1, Applied Biology 2, U.S. History and the Constitution, or English 1 were taught. Summary data are reported for operational tests only.

Demographic data were collected for each student. These data included the categories of gender, race/ethnicity, grade, English language proficiency (LEP, limited English proficiency), free/reduced-price meal program participation, Individualized Education Plan (IEP) or 504 Accommodation Plan status, disability status, and migrant status. Table 2.1 presents the combined student participation in the three EOCEP administrations (fall, spring, and summer) by the demographic variables.

**Table 2.1**  
**Summary of 2012-13 Student Demographics in the Sample**

Demographics	Algebra 1/ Math Tech 2		Biology		English 1		US Hist. & Const.	
	N	%	N	%	N	%	N	%
<b>Overall</b>	56,813	100.00	52,611	100.00	55,802	100.00	47,568	100.00
<b>Gender</b>								
Female	27,793	48.92	25,770	48.98	27,094	48.55	23,684	49.79
Male	28,629	50.39	26,434	50.24	28,344	50.79	23,510	49.42
Unknown	391	0.69	407	0.77	364	0.65	374	0.79
<b>Grade</b>								
6	13	0.02	2	0.004	0	--	0	--
7	3,020	5.32	1	0.002	6	0.011	0	--
8	13,871	24.42	146	0.28	12,234	21.92	0	--
9	29,855	52.55	20,081	38.17	42,555	76.26	542	1.14
10	8,633	15.20	29,287	55.67	494	0.89	5,548	11.66
11	781	1.37	1,938	3.68	106	0.19	38,306	80.53
12	274	0.48	748	1.42	58	0.10	2,741	5.76
Adult education	22	0.04	22	0.04	5	0.01	75	0.16
Other	344	0.61	386	0.73	344	0.62	356	0.75
<b>Ethnicity</b>								
Hispanic or Latino	3,220	5.67	2,871	5.46	3,161	5.66	2,372	4.99
American Indian or Alaska Native	164	0.29	126	0.24	179	0.32	139	0.29
Asian	782	1.38	698	1.33	755	1.35	698	1.47
Black or African American	19,158	33.72	17,750	33.74	18,823	33.73	16,373	34.42
Native Hawaiian or Other Pacific Islander	75	0.13	56	0.11	82	0.15	63	0.13
White	31,499	55.44	29,229	55.56	30,863	55.31	26,229	55.14
Two or More Races	1,176	2.07	1,139	2.16	1,156	2.07	913	1.92
Other	739	1.30	742	1.41	783	1.40	781	1.64

**Table 2.1**  
**Summary of 2012-13 Student Demographics in the Sample**

<b>Cont'd</b>								
<b>Language</b>								
Parent waiver	63	0.11	56	0.11	71	0.13	41	0.09
Pre-functional	151	0.27	124	0.24	155	0.28	96	0.20
Beginner	212	0.37	213	0.40	234	0.42	114	0.24
Intermediate	515	0.91	423	0.80	512	0.92	295	0.62
Advanced	1,245	2.19	1,037	1.97	1,161	2.08	802	1.69
Initially English Proficient	18	0.03	18	0.03	19	0.03	15	0.03
Title III First Year Exited	143	0.25	206	0.39	108	0.19	251	0.53
Title III Second + Year Exited	143	0.25	118	0.22	87	0.16	108	0.23
English Speaker I	494	0.87	415	0.79	559	1.00	370	0.78
English Speaker II	52,459	92.34	48,825	92.80	51,517	92.32	44,106	92.72
Other	1,370	2.41	1,176	2.24	1,379	2.47	1,370	2.88
<b>Lunch</b>								
Free meals	25,114	44.20	22,425	42.62	25,089	44.96	18,812	39.55
Reduced-price meals	3,903	6.87	3,454	6.57	3,794	6.80	3,056	6.42
No free/reduced-price meals	27,796	48.93	26,732	50.81	26,919	48.24	25,700	54.03
<b>IEP</b>								
Yes	4,829	8.50	4,947	9.40	5,195	9.31	3,598	7.56
No	51,984	91.50	47,664	90.60	50,607	90.69	43,970	92.44
<b>Migrant</b>								
Yes	15	0.03	13	0.02	15	0.03	8	0.02
No	56,798	99.97	52,598	99.98	55,787	99.97	47,560	99.98
<b>Gifted/talented</b>								
Academic	9,970	17.55	6,953	13.22	9,120	16.34	4,569	9.61
Artistic	1,115	1.96	904	1.72	1,153	2.07	1,147	2.41
Both	1,314	2.31	516	0.98	1,295	2.32	369	0.78
No	44,414	78.18	44,238	84.09	44,234	79.27	41,483	87.21
<b>504 Plan</b>								
Yes	1,011	1.78	955	1.82	1,016	1.82	854	1.80
No	55,802	98.22	51,656	98.18	54,786	98.18	46,714	98.20
<b>Alternative school</b>								
Yes	858	1.51	807	1.53	912	1.63	717	1.51
No	55,955	98.49	51,804	98.47	54,890	98.37	46,851	98.49
<b>Accommodations</b>								
Yes	1,393	2.45	1,657	3.15	1,526	2.73	1,157	2.43
No	55,420	97.55	50,954	96.85	54,276	97.27	46,411	97.57

**Note:** Includes all students who attempted the test except home school students.

## 2.2 ACCOMMODATIONS

Supplemental information regarding the administration of the EOCEP to students with disabilities is contained in Appendix C of the EOCEP Test Administration Manuals (SCDE 2012b and 2013b). These manuals provide guidelines for IEP teams in making decisions about testing students with disabilities and give specific information regarding standard and non-



standard testing accommodations, customized test forms and materials, and test administration procedures.

A student with a documented disability is one who has been evaluated and found to meet the eligibility criteria for enrollment in special education as defined by the 1997 amendments to the Individuals with Disabilities Education Act and by South Carolina State Board of Education Regulation 43-243.1, or one who has a disability covered under Section 504 of the Rehabilitation Act of 1973. The IEP or 504 Accommodation Plan team determines how a student with disabilities participates in the EOCEP assessments. Decisions about standard and non-standard accommodations must be made on an individual student basis, not on the basis of the category of disability or instructional placement. Table 2.2 presents the percentages of standard accommodations used in the current year's testing.

**Table 2.2**  
**Percentages of Students Using Accommodations in 2012–13 EOCEP Testing**

<b>Accommodations</b>	<b>Algebra 1/ Math Tech 2</b>	<b>Biology</b>	<b>English 1</b>	<b>US Hist. &amp; Const.</b>
<b>Regular Form</b>				
	<b>(N =56,775)</b>	<b>(N =52,572)</b>	<b>(N =55,756)</b>	<b>(N =47,544)</b>
Setting	2.25	2.83	2.49	2.24
Timing	0.12	0.17	0.14	0.11
Scheduling	0.04	0.03	0.02	0.03
Response options	0.08	0.10	0.06	0.10
Presentation	0.55	0.86	0.68	0.68
Supplemental Materials	0.09	0.11	0.13	0.06
<b>Customized Form</b>				
	<b>(N =38)</b>	<b>(N =39)</b>	<b>(N =46)</b>	<b>(N =24)</b>
Setting	23.68	61.54	15.22	50.00
Timing	--	46.15	4.35	45.83
Scheduling	--	33.33	--	41.67
Response options	18.42	12.82	10.87	8.33
Presentation	18.42	56.41	13.04	45.83
Supplemental Materials	21.05	12.82	10.87	25.00

**Note:** Includes all students who attempted the test except home school students.

Total responses in each column for the Customized Form may exceed 100 percent because some students received accommodations in more than one category.

## 2.3 TEST ADMINISTRATION TIME

In addition to providing their demographic information, students were asked to record on their answer documents the exact times that they started and finished the test. These answer documents were scanned, and the total elapsed time was calculated for each student. (It was not possible to calculate a total testing time for students with incomplete or invalid data.) The majority of students finished the test within two hours, as tables 2.3 and 2.4 reflect.

**Table 2.3**  
**Percentages of Students by Testing-Time Intervals in 2012–13 EOCEP Testing**  
**(with Regular Forms)**

	<b>Algebra 1/Math Tech 2</b>			<b>Biology</b>		
	<b>Fall 2012</b> <b>(N =8,374)</b>	<b>Spring 2013</b> <b>(N =48,283)</b>	<b>Summer 2013</b> <b>(N =118)</b>	<b>Fall 2012</b> <b>(N =13,431)</b>	<b>Spring 2013</b> <b>(N =39,090)</b>	<b>Summer 2013</b> <b>(N =51)</b>
Less than 15 min	0.10	0.11	--	0.10	0.11	--
15 min - 29 min	0.93	0.76	3.39	1.91	1.12	3.92
30 min - 44 min	5.80	3.94	11.86	13.29	9.02	31.37
45 min - 59 min	17.72	13.05	19.49	29.18	23.83	33.33
1 hr - 1 hr 14 min	26.79	21.17	14.41	26.15	26.87	17.65
1 hr 15 min - 1 hr 29 min	20.93	19.57	14.41	13.33	17.49	3.92
1 hr 30 min - 1 hr 44 min	11.52	14.77	8.47	6.85	9.40	5.88
1 hr 45 min - 1 hr 59 min	6.33	9.27	4.24	3.65	4.81	--
2 hr - 2 hr 14 min	4.11	5.94	1.69	1.39	2.52	--
2 hr 15 min - 2 hr 29 min	2.01	3.58	5.93	0.92	1.31	1.96
2 hr 30 min - 2 hr 44 min	0.91	1.95	15.25	0.42	0.68	1.96
2 hr 45 min - 2 hr 59 min	0.72	1.22	--	0.20	0.33	--
3 hr or more	0.82	3.37	0.85	0.42	1.34	--
Invalid*	1.31	1.30	--	2.21	1.17	--

  

	<b>English 1</b>			<b>US History and Constitution</b>		
	<b>Fall 2012</b> <b>(N =7,531)</b>	<b>Spring 2013</b> <b>(N =48,132)</b>	<b>Summer 2013</b> <b>(N =93)</b>	<b>Fall 2012</b> <b>(N =10,887)</b>	<b>Spring 2013</b> <b>(N =36,599)</b>	<b>Summer 2013</b> <b>(N =58)</b>
Less than 15 min	0.05	0.05	--	0.18	0.08	--
15 min - 29 min	0.80	0.81	3.23	5.87	2.62	15.52
30 min - 44 min	4.93	7.57	10.75	26.87	18.32	43.10
45 min - 59 min	14.78	20.22	13.98	30.63	29.85	27.59
1 hr - 1 hr 14 min	23.24	24.58	15.05	19.89	23.40	5.17
1 hr 15 min - 1 hr 29 min	20.73	18.29	18.28	8.30	11.83	3.45
1 hr 30 min - 1 hr 44 min	14.21	11.25	13.98	3.46	5.65	3.45
1 hr 45 min - 1 hr 59 min	8.48	6.44	5.38	1.58	2.93	--
2 hr - 2 hr 14 min	4.85	3.66	2.15	0.96	1.55	--
2 hr 15 min - 2 hr 29 min	2.56	2.14	--	0.48	0.83	--
2 hr 30 min - 2 hr 44 min	1.61	1.24	3.23	0.27	0.57	--
2 hr 45 min - 2 hr 59 min	0.85	0.69	--	0.13	0.23	--
3 hr or more	1.43	1.93	2.15	0.14	0.89	1.72
Invalid*	1.49	1.12	11.83	1.24	1.25	--

\* includes responses with no mark or multiple marks on start and/or stop time fields, making it impossible to compute the difference between start and stop times

**Note:** Includes all students who attempted the test using a regular form except home school students.

**Table 2.4**  
**Percentages of Students by Testing-Time Intervals in 2012–13 EOCEP Testing**  
**(with Customized Forms)**

	<b>Algebra 1/Math Tech 2</b>			<b>Biology</b>		
	<b>Fall 2012</b> <b>(N =0)</b>	<b>Spring 2013</b> <b>(N =38)</b>	<b>Summer 2013</b> <b>(N =0)</b>	<b>Fall 2012</b> <b>(N =4)</b>	<b>Spring 2013</b> <b>(N =35)</b>	<b>Summer 2013</b> <b>(N =0)</b>
Less than 15 min	--	--	--	--	--	--
15 min - 29 min	--	--	--	--	--	--
30 min - 44 min	--	7.89	--	--	2.86	--
45 min - 59 min	--	7.89	--	--	2.86	--
1 hr - 1 hr 14 min	--	7.89	--	--	8.57	--
1 hr 15 min - 1 hr 29 min	--	13.16	--	--	8.57	--
1 hr 30 min - 1 hr 44 min	--	13.16	--	50.00	5.71	--
1 hr 45 min - 1 hr 59 min	--	10.53	--	25.00	17.14	--
2 hr - 2 hr 14 min	--	10.53	--	--	11.43	--
2 hr 15 min - 2 hr 29 min	--	10.53	--	--	11.43	--
2 hr 30 min - 2 hr 44 min	--	2.63	--	--	5.71	--
2 hr 45 min - 2 hr 59 min	--	--	--	--	--	--
3 hr or more	--	13.16	--	--	22.86	--
Invalid*	--	2.63	--	25.00	2.86	--

  

	<b>English 1</b>			<b>US History and Constitution</b>		
	<b>Fall 2012</b> <b>(N =3)</b>	<b>Spring 2013</b> <b>(N =43)</b>	<b>Summer 2013</b> <b>(N =0)</b>	<b>Fall 2012</b> <b>(N =1)</b>	<b>Spring 2013</b> <b>(N =23)</b>	<b>Summer 2013</b> <b>(N =0)</b>
Less than 15 min	--	--	--	--	--	--
15 min - 29 min	--	--	--	--	--	--
30 min - 44 min	--	2.33	--	--	--	--
45 min - 59 min	--	11.63	--	--	4.35	--
1 hr - 1 hr 14 min	--	9.30	--	--	4.35	--
1 hr 15 min - 1 hr 29 min	--	9.30	--	--	13.04	--
1 hr 30 min - 1 hr 44 min	--	16.28	--	--	21.74	--
1 hr 45 min - 1 hr 59 min	--	9.30	--	100.00	8.70	--
2 hr - 2 hr 14 min	33.33	13.95	--	--	21.74	--
2 hr 15 min - 2 hr 29 min	--	--	--	--	4.35	--
2 hr 30 min - 2 hr 44 min	--	6.98	--	--	8.70	--
2 hr 45 min - 2 hr 59 min	--	--	--	--	--	--
3 hr or more	33.33	2.33	--	--	8.70	--
Invalid*	33.33	18.60	--	--	4.35	--

\* includes responses with no mark or multiple marks on start and/or stop time fields, making it impossible to compute the difference between start and stop times

**Note:** Includes all students who attempted the test using a regular form except home school students.

## 2.4 STUDENT QUESTIONNAIRE

After the administration of the Biology EOCEP test during the fall and spring, students were instructed to complete a questionnaire that addressed such topics as the difficulty of the test, the nature of the instruction they had received, and the amount of time they had spent engaged in laboratory activities.

## CHAPTER 3

### TEST ADMINISTRATION

#### 3.1 TEST ADMINISTRATION WINDOW

The test administration dates for the current year are given in Table 3, below. Within the state-approved testing window, districts selected a 10-day testing window for paper-pencil testing and a 15-day testing window for online testing. The SCDE recommends that districts administer the EOCEP tests over five consecutive days and use the additional days to complete make-up testing or to accommodate technological resources needed for online testing. Make-up testing was provided for students who missed the originally scheduled EOCEP test due to a death in the family, illness, or another situation deemed valid by the state. It was recommended that a single makeup test be given per day, but two could have been given per day if necessary. For all three EOCEP administrations, district test coordinators (DTCs) were responsible for providing the testing schedule to all school test coordinators (STCs) in their districts.

**TABLE 3**  
**2012–13 EOCEP Test Administration Windows**

<b>Administration</b>	<b>Dates</b>
Fall 2012	December 3 – January 29
Spring 2013	May 8 – June 10
Summer 2013	June 24 – July 26

#### 3.2 TIMING OF THE TEST

The EOCEP tests were not timed; however, each session had to be administered during a single day (unless a student's IEP or 504 Plan specifically stated that he or she needed to have the test administered over several days). To ensure an accurate assessment, districts and schools were instructed that students should be given as much time as they needed to complete the test.

#### 3.3 ADMINISTRATION MANUALS

Working with the SCDE, DRC staff drafted the administration manuals for the test. SCDE staff reviewed and revised the manuals, and DRC finalized and printed them. The EOCEP district test coordinator supplements (SCDE 2012a, 2013a, and 2013d) were produced for each administration of the EOCEP. The DTC supplements included only the information that DTCs needed for the administration of the EOCEP tests. Test Administration Manuals (TAMs) (2012b and 2013b) were provided each fall and spring administration; the spring TAM is also used for reference each summer. Separate TAMs for online testing (2012c and 2013c) were produced for both fall and spring administrations and were available for download from both the SCDE and

DRC. The TAMs contained the information that STCs, test administrators (TAs), and monitors needed to administer the tests to students in their schools.

The TAMs and the supplements included logistical and administration procedures as well as the directions (scripts) for administering the tests. The DTCs, STCs, and TAs were encouraged to offer comments and suggestions on the procedures therein.

Appendix C in the TAMs includes a detailed description of customized materials available, as well as additional graphics for completing student demographic information and returning scorable and nonscorable test materials. Tables showing the types of customized materials available for students who require such special testing formats were also provided.

### **3.4 CUSTOMIZED MATERIALS**

Customized formats of the EOCEP test were available for Algebra 1/Mathematics for the Technologies 2, Biology 1/Applied Biology 2, English 1, and United States History and the Constitution:

- Loose-leaf test booklets—were printed single-sided, and bound in three-ring binders—allowed individuals to remove the pages, if necessary, during testing. Except for the English 1 test, this form contains only one item per page.
- Large-print booklets were produced for students who have difficulty reading text in a standard-size font. The large-print version used an 18-point sans serif font and was issued as a 9 x 12-inch spiral-bound booklet.
- Form C Braille test booklets were produced for students who typically read classroom materials in braille. The braille version was issued as spiral-bound booklets containing 11½ x 11-inch interpoint braille pages.
- A regular print Form C test booklet was provided in test packets for students or TAs to use with customized formats such as the braille oral script, braille, large-print, loose-leaf, and sign language versions. These booklets were saddle-stitched and printed in a 12-point font, just as the regular, noncustomized test booklets were.
- For students whose IEP or 504 Plan requires the oral administration of tests, oral administration scripts provided the directions to TAs regarding the appropriate way to read test questions, passages, and answer choices to the students.
- CD-ROMs were also produced to provide audio oral administration of the tests and contained recorded administration directions, passages, test questions, and the text-based answer choices. The CD-ROMs and the oral administration scripts contained the same information. Audio oral administration is also available in online test forms.
- Sign language DVDs included the signed test directions, questions, and most answer choices. Each DVD contains both American Sign Language (ASL) and Pidgin Signed English (PSE).

### 3.5 MATERIALS SHIPPING AND RETURN

For all three administrations, test materials were shipped to district offices approximately two weeks before testing—in time for the DTCs to be able to distribute school materials at least one week before the schools' test dates. Each school's shipment was boxed individually and labeled with the total number of boxes shipped to that school.

The district office was also sent a shipment of noncustomized overage materials, which were to be used by the DTCs to complete any additional materials requests from the STCs. Materials in customized formats were sent only to the schools and only in the quantities ordered.

TAs were instructed to return their test materials to the STCs immediately after the test administration. The STCs then redistributed test materials to the TAs who needed them in order to administer makeup tests. Those TAs were instructed to return the makeup test materials to their STC immediately after the makeup session. DTCs were to arrange for the pickup of all scorable materials for return to DRC within three days after testing.

Because the test scores were required to be reported back to the schools within thirty-six hours for calculating final course grades, a rapid scoring and reporting process was utilized for all three administrations. Each school district could return the scorable materials to DRC in as many as five separate shipments. Nonscorable materials were to be returned in one shipment within three days of the completion of makeup tests. For all three administrations, step-by-step instructions for returning scorable and nonscorable materials were included in the TAM and DTC Supplement. These instructions listed the toll-free phone numbers of the shipping companies that the DTCs were instructed to call to schedule pickups of return materials

### 3.6 TEST SECURITY

Test security is an important issue before, during, and following test administrations. The specific procedures to be followed during the EOCEP test administrations are outlined in the *Test Administration Manual* (2012b and 2013b). The manual includes an excerpt from Section 59-1-445 of the South Carolina Code of Laws, a summary of Section 59-1-447 of the Code of Laws, and the entirety of State Board of Education Regulation 43-100.

Section 59-1-445 states in part:

It is unlawful for anyone knowingly and wilfully [*sic*] to violate security procedures regulations promulgated by the State Board of Education for mandatory tests administered by or through the State Board of Education to students or educators, or knowingly and willfully to:

- (a) Give examinees access to test questions prior to testing;
- (b) Copy, reproduce, or use in any manner inconsistent with test security regulations all or any portion of any secure test booklet;
- (c) Coach examinees during testing or alter or interfere with examinees' responses in any way;
- (d) Make answer keys available to examinees;

- (e) Fail to follow security regulations for distribution and return of secure test [materials] as directed, or fail to account for all secure test materials before, during, and after testing;
- (f) Participate in, direct, aid, counsel, assist in, encourage, or fail to report any of the acts prohibited in this section.

Regulation 43-100 mandates that “Each local school board must develop and adopt a district test security policy” with procedures for the storage and handling of all test materials and that each district superintendent must annually designate a DTC. The regulation and the *TAM* provide specific security guidelines regarding various aspects of the test administration process (e.g., the storage and handling of test materials, the responsibility of administrators to monitor students during testing and to remove supplemental materials from the testing room, and the requirement that administrators refrain from interference with student responses).

Following the test administration and the return of materials, DRC generated a missing-document report, listing the identification numbers of unreturned secure materials. The report was used to notify districts of missing materials. A toll-free telephone line was manned to answer questions regarding missing documents, and follow-up procedures were employed until all materials were accounted for. Subsequently, the districts located and returned the materials or sent signed statements indicating that all secure materials had been returned.

### **Secure Materials**

Secure materials—each assigned a human- and machine-readable security identification number—are test booklets, answer documents, customized test materials, and administration scripts. Secure materials are locked in storage until the day of the test administration and are signed out when they are to be used, and signed in when they are returned. These materials are not to be left unattended at any time.

## CHAPTER 4

### TECHNICAL CHARACTERISTICS OF ITEMS

This chapter reports the results of item analyses based on classical test theory (CTT) using a proprietary program designed by DRC. Item difficulty ( $p$ ) is the proportion (or percentage) of examinees correctly answering a dichotomously scored item.

Item discrimination is defined as a correlation between the item score and the total score. For the discrimination index, point-biserial correlations were produced. In computing the point-biserial correlation, DRC corrected for spuriousness. In the recoding of missing data for item analysis, all omitted and not-reached items were recoded as incorrect, with a zero score. After discussions between the SCDE and DRC, it was decided to exclude from the CTT item analyses and item calibrations those students who had used customized test materials.

#### 4.1 ITEM NONRESPONSE RATES

Although the EOCEP tests were not timed, students were required to finish each test during one school day, unless they had an IEP that allowed for accommodations in administration. Districts and schools were instructed that, if they had space and staff available, students should be given as much ~~uninterrupted~~ time as necessary to take the test to ensure an accurate assessment.

The item nonresponse rates indicate the percentage of students who did not reach a particular item and all items thereafter. The item omit rates indicate the percentage of students who did not respond to that particular item but did respond to a later item. The percentages for not-reached and omit rates were quite low—less than 1 percent—in all subjects. These data indicate that students were given ample time to complete the test in every subject.



## 4.2 CLASSICAL ITEM STATISTICS

Table 4 provides a summary of item  $p$ -values and item discrimination values for operational items for all three administrations.

**Table 4**  
**Summary of Classical Item Statistics**

<b>Administration</b>	<b>Number of items</b>	<b>Mean <math>p</math>-value</b>	<b>Adjusted Point-Biserial Correlation</b>
<b>Algebra 1/Math Tech 2</b>			
Fall 2012	50	0.563	0.310
Spring 2013	50	0.610	0.326
Summer 2013	50	0.509	0.231
<b>Biology</b>			
Fall 2012	60	0.616	0.332
Spring 2013	60	0.619	0.330
Summer 2013	60	0.537	0.336
<b>English 1</b>			
Fall 2012	55	0.696	0.300
Spring 2013	55	0.717	0.322
Summer 2013	55	0.608	0.325
<b>US History and Constitution</b>			
Fall 2012	55	0.541	0.307
Spring 2013	55	0.568	0.321
Summer 2013	55	0.460	0.289

**Note:** Includes all students who attempted the test using a complete regular form except home school students and students in an adult education program.

## **CHAPTER 5**

### **ITEM CALIBRATION AND SCALING**

#### **5.1 METHODOLOGY AND SOFTWARE**

The one-parameter Rasch model (Rasch 1960; Wright and Stone 1979) was used to calibrate all items, using WINSTEPS software (see Linacre and Wright 2003). The WINSTEPS program employs joint maximum likelihood estimation, an approach that estimates the item and person parameters simultaneously.

#### **5.2 ITEM CALIBRATION AND PRE-EQUATING**

The AIR conducted field tests with a sufficient number of items to create precalibrated item pools and to construct pre-equated operational-test forms for all tests. For all subjects, the Rasch-ability-score-to-scale-score conversion tables were produced prior to each test administration based on the item parameters in the pre-equated item pools. If an item or items on a test form had to be replaced, SCDE staff recalibrated the forms, producing new conversion tables.

#### **5.3 SCALING**

The SCDE provided DRC with initial Rasch-ability-score-to-scale-score conversion tables that showed the transformation of the ability score interval for each scale score for each subject area. DRC then applied these tables specifically to each test form for each subject area on the basis of the pre-equated item pool. The conversion tables took into account any differences in the difficulty of the various forms. All items shared a common metric so that the scale scores developed for each form were automatically adjusted for differences in item difficulty. For all EOCEP test subjects, the scale scores are now reported according to the South Carolina UGS. Scale scores range from 0 to 100 with a minimum passing score of 70. Each scale score is assigned a letter-grade equivalent (A, B, C, D, or F) in accordance with the UGS.

#### **5.4 DEFINITION OF SCOREABILITY**

A student was considered “tested” if the student answered at least one question on the answer document or by means of the online testing system. All tested students’ item responses were scored. All omits and not-reached items were recoded as incorrect, with a zero score.

#### **5.5 REPORTING OF ZERO AND PERFECT SCORES**

In item response theory (IRT), zero and perfect scores are assigned the ability of minus and plus infinity. The AIR used the WINSTEPS default setting in estimating finite values for the extreme scores. In other words, a fractional score point value was subtracted from perfect scores, and was added to zero scores. The WINSTEPS default value for adjusting the extreme scores for extreme measures is 0.3. This value was also used by SCDE staff when recalibrating forms.

## 5.6 PERCENTAGE OF STUDENTS SCORING IN EACH LETTER-GRADE EQUIVALENT

Tables 5.1 through 5.8 report student performance for all administrations combined. The results are summarized separately for public middle and high schools and for adult education programs. The number and percentage of students in each letter-grade equivalent and the mean scale score are reported for the test-takers overall and by demographic category.

**Table 5.1**  
**Algebra 1/Math Tech 2 Operational Test, Grades 6-12:**  
**Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics**

<b>Demographics</b>	<b>N</b>	<b>Mean Scale Score</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>F</b>
<b>Overall</b>	56,791	80.63	16.34	20.83	26.39	19.27	17.17
<b>Gender</b>							
Female	27,784	81.34	17.33	21.74	27.24	18.96	14.73
Male	28,621	80.04	15.55	20.04	25.62	19.52	19.27
Unknown	386	74.07	4.40	13.47	22.54	23.06	36.53
<b>Grade</b>							
6	13	93.92	69.23	15.38	7.69	7.69	0.00
7	3,020	93.46	61.39	25.33	9.74	2.48	1.06
8	13,871	88.20	35.19	32.37	21.62	7.40	3.42
9	29,855	78.09	7.88	18.85	29.96	23.17	20.14
10	8,633	73.81	1.67	9.16	27.70	29.40	32.07
11	781	73.86	2.05	9.86	25.22	30.35	32.52
12	274	75.97	4.38	12.41	31.02	25.18	27.01
Other	344	73.60	4.07	11.92	22.09	23.55	38.37
<b>Ethnicity</b>							
Hispanic or Latino	3,219	80.08	13.26	21.62	28.15	21.16	15.81
American Indian or Alaska Native	164	79.15	12.20	20.73	26.22	18.90	21.95
Asian	782	89.40	44.88	25.19	17.14	7.42	5.37
Black or African American	19,156	76.15	6.11	14.41	27.14	25.32	27.02
Native Hawaiian or Other Pacific Islander	75	85.08	24.00	28.00	29.33	12.00	6.67
White	31,497	83.31	22.43	24.64	25.99	15.67	11.27
Two or More Races	1,176	81.40	16.24	23.13	28.06	17.86	14.71
Other	722	74.44	5.68	11.77	23.27	23.41	35.87
<b>Language</b>							
Parent waiver	63	80.00	12.70	19.05	26.98	23.81	17.46
Pre-functional	151	70.66	5.30	5.30	17.22	23.18	49.01
Beginner	212	72.78	4.72	6.60	22.64	31.13	34.91
Intermediate	515	75.91	5.24	13.01	27.18	27.96	26.60
Advanced	1,245	82.14	16.71	24.34	30.04	18.63	10.28
Initially English Proficient	18	83.11	16.67	33.33	27.78	16.67	5.56
Title III First Year Exited	143	87.06	32.17	30.77	23.08	9.09	4.90
Title III Second + Year Exited	143	90.50	49.65	23.08	17.48	4.90	4.90
English Speaker I	494	87.02	33.60	27.73	23.48	10.93	4.25
English Speaker II	52,459	80.73	16.44	21.05	26.47	19.20	16.84
Other	1,348	75.37	8.31	11.87	23.66	22.48	33.68

**Table 5.1**  
**Algebra 1/Math Tech 2 Operational Test, Grades 6-12:**  
**Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics**

<b>Demographics</b>	<b>N</b>	<b>Mean Scale Score</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>F</b>
<b>Lunch</b>							
Free meals	25,113	77.07	7.65	16.33	27.52	23.86	24.64
Reduced-price meals	3,903	79.95	12.58	20.65	29.72	20.52	16.53
No free/reduced-price meals	27,775	83.95	24.73	24.92	24.91	14.95	10.50
<b>IEP</b>							
Yes	4,828	71.66	2.78	7.29	18.37	26.28	45.28
No	51,963	81.47	17.60	22.08	27.14	18.62	14.55
<b>Migrant</b>							
Yes	15	79.47	6.67	33.33	26.67	13.33	20.00
No	56,776	80.63	16.35	20.82	26.39	19.27	17.17
<b>Courses taken</b>							
4211 (Alg 1)	46,572	82.15	19.48	23.44	26.42	16.86	13.80
3142 (Math for the Techs 2)	10,116	73.57	1.61	8.70	26.34	30.52	32.83
Other	103	90.70	45.63	31.07	17.48	3.88	1.94
<b>Gifted/talented</b>							
Academic	9,970	91.28	48.61	30.97	15.28	4.13	1.01
Artistic	1,115	83.61	19.37	27.26	31.30	13.99	8.07
Both	1,314	93.39	59.51	27.32	10.50	2.05	0.61
No	44,392	77.79	7.74	18.19	29.23	23.31	21.51
<b>504 Plan</b>							
Yes	1,011	79.29	12.96	20.18	26.21	20.67	19.98
No	55,780	80.66	16.41	20.84	26.39	19.25	17.12
<b>Alternative school</b>							
Yes	858	70.05	1.28	6.41	13.99	24.94	53.38
No	55,933	80.80	16.58	21.05	26.58	19.18	16.61
<b>Accommodations</b>							
Yes	1,393	71.80	2.51	6.82	19.96	27.28	43.43
No	55,398	80.86	16.69	21.18	26.55	19.07	16.51

**Note:** Includes all students who attempted the test except home school students and students in an adult education program.

**Table 5.2**  
**Algebra 1/Math Tech 2 Operational Test, Adult Education Programs:**  
**Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics**

<b>Demographics</b>	<b>N</b>	<b>Mean Scale Score</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>F</b>
<b>Overall</b>	22	69.14	--	9.09	4.55	22.73	63.64
<b>Gender</b>							
Female	9	--	--	--	--	--	--
Male	8	--	--	--	--	--	--
Unknown	5	--	--	--	--	--	--
<b>Ethnicity</b>							
Hispanic or Latino	1	--	--	--	--	--	--
Black or African American	2	--	--	--	--	--	--
White	2	--	--	--	--	--	--
Other	17	69.47	--	11.76	5.88	17.65	64.71
<b>Language</b>							
Other	22	69.14	--	9.09	4.55	22.73	63.64
<b>Lunch</b>							
Free meals	1	--	--	--	--	--	--
No free/reduced-price meals	21	68.95	--	9.52	4.76	19.05	66.67
<b>IEP</b>							
Yes	1	--	--	--	--	--	--
No	21	69.52	--	9.52	4.76	23.81	61.90
<b>Migrant</b>							
No	22	69.14	--	9.09	4.55	22.73	63.64
<b>Courses taken</b>							
4111 (Alg 1)	15	67.67	--	6.67	--	20.00	73.33
3142 (Math for the Techs 2)	6	--	--	--	--	--	--
Other	1	--	--	--	--	--	--
<b>Gifted/talented</b>							
No	22	69.14	--	9.09	4.55	22.73	63.64
<b>504 Plan</b>							
No	22	69.14	--	9.09	4.55	22.73	63.64
<b>Alternative school</b>							
No	22	69.14	--	9.09	4.55	22.73	63.64
<b>Accommodations</b>							
No	22	69.14	--	9.09	4.55	22.73	63.64

**Note:** Includes all students who attempted the test and are in an adult education program except home school students.  
If the number tested is less than 10, no other statistics appear.

**Table 5.3**  
**Biology Operational Test, Grades 6-12:**  
**Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics**

<b>Demographics</b>	<b>N</b>	<b>Mean Scale Score</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>F</b>
<b>Overall</b>	52,589	81.33	28.02	15.96	19.35	14.92	21.75
<b>Gender</b>							
Female	25,758	81.43	27.07	16.17	20.32	15.80	20.63
Male	26,429	81.27	28.99	15.87	18.40	14.05	22.69
Unknown	402	78.19	25.37	8.46	19.65	14.93	31.59
<b>Grade</b>							
6	2	--	--	--	--	--	--
7	1	--	--	--	--	--	--
8	146	83.42	35.62	18.49	17.12	10.27	18.49
9	20,081	81.48	29.57	15.50	18.46	14.22	22.26
10	29,287	81.84	28.36	16.75	19.99	14.95	19.95
11	1,938	74.81	12.33	11.40	19.87	20.18	36.22
12	748	75.17	13.77	12.43	17.38	20.05	36.36
Other	386	78.33	25.39	9.33	19.69	14.25	31.35
<b>Ethnicity</b>							
Hispanic or Latino	2,871	78.90	20.27	15.74	21.04	16.82	26.12
American Indian or Alaska Native	125	80.46	26.40	14.40	18.40	18.40	22.40
Asian	698	88.00	49.43	16.76	14.47	7.74	11.60
Black or African American	17,746	74.49	10.58	11.86	20.92	20.56	36.08
Native Hawaiian or Other Pacific Islander	56	82.45	26.79	25.00	17.86	10.71	19.64
White	29,224	85.65	39.03	18.50	18.39	11.42	12.66
Two or More Races	1,139	82.89	29.32	19.23	19.93	15.01	16.51
Other	730	75.30	19.32	8.77	17.26	16.58	38.08
<b>Language</b>							
Parent waiver	56	78.61	16.07	25.00	17.86	16.07	25.00
Pre-functional	124	61.09	4.03	0.81	4.03	7.26	83.87
Beginner	213	64.41	1.88	4.69	7.51	17.37	68.54
Intermediate	423	69.97	3.31	7.09	15.60	21.04	52.96
Advanced	1,037	79.43	16.68	16.68	26.23	19.58	20.83
Initially English Proficient	18	77.83	11.11	22.22	22.22	22.22	22.22
Title III First Year Exited	206	87.95	38.83	25.24	20.87	10.68	4.37
Title III Second + Year Exited	118	88.68	45.76	18.64	22.03	8.47	5.08
English Speaker I	415	90.30	53.25	17.83	16.14	9.16	3.61
English Speaker II	48,825	81.65	28.63	16.21	19.45	14.79	20.92
Other	1,154	73.89	16.98	8.75	14.82	17.50	41.94
<b>Lunch</b>							
Free meals	22,423	75.78	13.51	13.17	20.72	19.54	33.05
Reduced-price meals	3,454	80.56	23.48	17.28	21.16	16.33	21.74
No free/reduced-price meals	26,712	86.08	40.78	18.13	17.97	10.86	12.26
<b>IEP</b>							
Yes	4,947	67.82	5.30	6.45	12.73	16.13	59.39
No	47,642	82.73	30.38	16.95	20.04	14.79	17.84
<b>Migrant</b>							
Yes	13	76.15	--	23.08	38.46	7.69	30.77
No	52,576	81.33	28.03	15.96	19.35	14.92	21.75

**Table 5.3**  
**Biology Operational Test, Grades 6-12:**  
**Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics**

<b>Demographics</b>	<b>N</b>	<b>Mean Scale Score</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>F</b>
<b>Courses taken</b>							
3221 (Biology 1)	49,369	81.96	29.46	16.44	19.44	14.45	20.22
3227 (Applied Biology 2)	3,177	71.52	5.35	8.72	18.16	22.41	45.36
Other	43	81.19	53.49	2.33	4.65	2.33	37.21
<b>Gifted/talented</b>							
Academic	6,953	94.74	72.08	16.63	8.38	2.16	0.75
Artistic	904	86.60	41.15	19.80	17.37	11.17	10.51
Both	516	96.53	81.78	12.21	4.84	1.16	0.00
No	44,216	78.93	20.19	15.82	21.29	17.16	25.54
<b>504 Plan</b>							
Yes	955	81.73	27.54	15.81	21.15	16.54	18.95
No	51,634	81.32	28.03	15.96	19.32	14.89	21.80
<b>Alternative school</b>							
Yes	807	68.96	5.20	5.58	15.61	20.32	53.28
No	51,782	81.52	28.37	16.12	19.41	14.83	21.26
<b>Accommodations</b>							
Yes	1,657	67.54	4.71	6.28	12.98	17.38	58.66
No	50,932	81.78	28.78	16.28	19.56	14.84	20.55

**Note:** Includes all students who attempted the test except home school students and students in an adult education program.  
If the number tested is less than 10, no other statistics appear.

**Table 5.4**  
**Biology Operational Test, Adult Education Programs:**  
**Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics**

<b>Demographics</b>	<b>N</b>	<b>Mean Scale Score</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>F</b>
<b>Overall</b>	22	69.68	9.09	4.55	9.09	22.73	54.55
<b>Gender</b>							
Female	12	65.25	--	--	16.67	16.67	66.67
Male	5	--	--	--	--	--	--
Unkown	5	--	--	--	--	--	--
<b>Ethnicity</b>							
American Indian or Alaska Native	1	--	--	--	--	--	--
Black or African American	4	--	--	--	--	--	--
White	5	--	--	--	--	--	--
Other	12	71.00	8.33	8.33	8.33	25.00	50.00
<b>Language</b>							
Other	22	69.68	9.09	4.55	9.09	22.73	54.55
<b>Lunch</b>							
Free meals	2	--	--	--	--	--	--
No free/reduced-price meals	20	69.15	10.00	5.00	5.00	20.00	60.00
<b>IEP</b>							
No	22	69.68	9.09	4.55	9.09	22.73	54.55
<b>Migrant</b>							
No	22	69.68	9.09	4.55	9.09	22.73	54.55
<b>Courses taken</b>							
3221 (Biology 1)	19	71.74	10.53	5.26	10.53	26.32	47.37
3227 (Applied Biology 2)	3	--	--	--	--	--	--
<b>Gifted/talented</b>							
No	22	69.68	9.09	4.55	9.09	22.73	54.55
<b>504 Plan</b>							
No	22	69.68	9.09	4.55	9.09	22.73	54.55
<b>Alternative school</b>							
No	22	69.68	9.09	4.55	9.09	22.73	54.55
<b>Accommodations</b>							
No	22	69.68	9.09	4.55	9.09	22.73	54.55

**Note:** Includes all students who attempted the test and are in an adult education program except home school students.  
If the number tested is less than 10, no other statistics appear.



**Table 5.5**  
**English 1 Operational Test, Grades 6-12:**  
**Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics**

<b>Demographics</b>	<b>N</b>	<b>Mean Scale Score</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>F</b>
<b>Overall</b>	55,797	77.92	10.67	17.48	28.31	20.78	22.75
<b>Gender</b>							
Female	27,093	79.03	12.33	18.46	29.02	20.56	19.62
Male	28,340	76.94	9.19	16.64	27.72	20.99	25.46
Unknown	364	70.75	2.47	9.34	21.70	21.43	45.05
<b>Grade</b>							
7	6	--	--	--	--	--	--
8	12,234	86.53	26.11	32.03	29.83	9.32	2.72
9	42,555	75.63	6.43	13.51	28.10	24.03	27.92
10	494	68.57	1.62	6.07	16.40	24.70	51.21
11	106	69.92	1.89	5.66	21.70	25.47	45.28
12	58	74.26	8.62	18.97	18.97	13.79	39.66
Other	344	70.87	2.91	9.88	20.93	21.22	45.06
<b>Ethnicity</b>							
Hispanic or Latino	3,160	75.34	6.55	12.50	30.16	23.01	27.78
American Indian or Alaska Native	179	75.52	6.70	12.29	27.93	27.93	25.14
Asian	755	83.18	26.62	23.71	25.30	9.14	15.23
Black or African American	18,821	72.81	3.05	8.86	24.75	27.12	36.22
Native Hawaiian or Other Pacific Islander	82	79.91	12.20	21.95	29.27	19.51	17.07
White	30,862	81.31	15.49	23.28	30.53	16.92	13.78
Two or More Races	1,156	78.66	10.81	18.34	29.84	21.19	19.81
Other	782	71.55	5.88	9.59	19.57	20.97	43.99
<b>Language</b>							
Parent waiver	71	74.73	--	8.45	38.03	30.99	22.54
Pre-functional	155	55.59	--	1.29	4.52	4.52	89.68
Beginner	234	60.05	--	0.00	2.99	12.39	84.62
Intermediate	512	68.05	0.59	1.76	15.04	26.56	56.05
Advanced	1,161	76.83	3.62	12.06	38.07	28.08	18.17
Initially English Proficient	19	81.21	5.26	21.05	52.63	15.79	5.26
Title III First Year Exited	108	83.98	17.59	26.85	34.26	16.67	4.63
Title III Second + Year Exited	87	84.57	14.94	32.18	35.63	16.09	1.15
English Speaker I	559	85.44	25.94	25.94	30.23	13.42	4.47
English Speaker II	51,517	78.24	10.95	17.94	28.58	20.73	21.79
Other	1,374	72.20	6.70	10.70	19.29	20.74	42.58
<b>Lunch</b>							
Free meals	25,089	73.64	4.10	10.60	25.77	25.62	33.91
Reduced-price meals	3,794	77.28	7.20	15.37	32.37	23.12	21.96
No free/reduced-price meals	26,914	81.99	17.29	24.19	30.11	15.95	12.46
<b>IEP</b>							
Yes	5,195	66.58	1.00	3.06	12.11	22.04	61.79
No	50,602	79.08	11.67	18.96	29.98	20.66	18.74
<b>Migrant</b>							
Yes	15	70.60	--	--	40.00	26.67	33.33
No	55,782	77.92	10.68	17.48	28.31	20.78	22.75
<b>Courses taken</b>							
3011 (Eng 1)	55,704	77.90	10.63	17.44	28.32	20.81	22.79
Other	93	89.56	33.33	40.86	20.43	4.30	1.08

**Table 5.5**  
**English 1 Operational Test, Grades 6-12:**  
**Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics**

<b>Demographics</b>	<b>N</b>	<b>Mean Scale Score</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>F</b>
<b>Gifted/talented</b>							
Academic	9,120	88.90	33.63	36.11	24.95	4.68	0.64
Artistic	1,153	81.69	13.53	23.59	34.95	17.26	10.67
Both	1,295	91.23	45.02	35.14	16.99	2.47	0.39
No	44,229	75.16	4.86	12.96	29.16	24.73	28.28
<b>504 Plan</b>							
Yes	1,016	77.10	8.07	17.22	28.35	21.65	24.70
No	54,781	77.93	10.72	17.48	28.31	20.77	22.72
<b>Alternative school</b>							
Yes	912	67.48	1.21	3.95	15.79	22.37	56.69
No	54,885	78.09	10.83	17.70	28.52	20.76	22.19
<b>Accommodations</b>							
Yes	1,526	66.21	1.05	3.34	11.93	21.23	62.45
No	54,271	78.25	10.94	17.88	28.77	20.77	21.64

**Note:** Includes all students who attempted the test except home school students and students in an adult education program.  
If the number tested is less than 10, no other statistics appear.

**Table 5.6**  
**English 1 Operational Test, Adult Education Programs:**  
**Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics**

<b>Demographics</b>	<b>N</b>	<b>Mean Scale Score</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>F</b>
<b>Overall</b>	5	--	--	--	--	--	--
<b>Gender</b>							
Female	1	--	--	--	--	--	--
Male	4	--	--	--	--	--	--
<b>Ethnicity</b>							
Hispanic or Latino	1	--	--	--	--	--	--
Black or African American	2	--	--	--	--	--	--
White	1	--	--	--	--	--	--
Other	1	--	--	--	--	--	--
<b>Language</b>							
Other	5	--	--	--	--	--	--
<b>Lunch</b>							
No free/reduced-price meals	5	--	--	--	--	--	--
<b>IEP</b>							
No	5	--	--	--	--	--	--
<b>Migrant</b>							
No	5	--	--	--	--	--	--
<b>Courses taken</b>							
3011 (Eng 1)	5	--	--	--	--	--	--
<b>Gifted/talented</b>							
No	5	--	--	--	--	--	--
<b>504 Plan</b>							
No	5	--	--	--	--	--	--
<b>Alternative school</b>							
No	5	--	--	--	--	--	--
<b>Accommodations</b>							
No	5	--	--	--	--	--	--

**Note:** Includes all students who attempted the test and are in an adult education program except home school students.  
If the number tested is less than 10, no other statistics appear.

**Table 5.7**  
**US History and Constitution Operational Test, Grades 6-12:**  
**Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics**

<b>Demographics</b>	<b>N</b>	<b>Mean Scale Score</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>F</b>
<b>Overall</b>	47,493	72.72	3.00	10.33	21.03	26.33	39.32
<b>Gender</b>							
Female	23,647	71.81	2.05	8.57	19.80	26.71	42.87
Male	23,476	73.68	3.99	12.13	22.37	25.92	35.59
Unknown	370	69.98	0.54	8.65	14.59	27.57	48.65
<b>Grade</b>							
9	542	65.82	1.66	3.51	9.04	17.71	68.08
10	5,548	68.94	1.71	5.68	13.55	23.05	56.00
11	38,306	73.50	3.30	11.25	22.48	26.99	35.98
12	2,741	71.28	1.97	8.43	19.30	25.17	45.13
Other	356	69.64	0.28	8.43	13.48	27.81	50.00
<b>Ethnicity</b>							
Hispanic or Latino	2,368	71.76	1.56	7.90	20.19	29.22	41.13
American Indian or Alaska Native	138	73.71	3.62	15.94	23.19	16.67	40.58
Asian	698	77.27	9.17	18.91	23.78	22.78	25.36
Black or African American	16,350	68.07	0.43	3.30	12.40	24.97	58.90
Native Hawaiian or Other Pacific Islander	62	76.69	1.61	25.81	19.35	27.42	25.81
White	26,212	75.60	4.64	14.61	26.32	27.11	27.31
Two or More Races	913	73.80	1.97	11.17	27.05	26.07	33.73
Other	752	70.71	1.46	10.24	16.62	24.73	46.94
<b>Language</b>							
Parent waiver	41	68.39	--	4.88	17.07	24.39	53.66
Pre-functional	96	60.55	--	1.04	1.04	9.38	88.54
Beginner	114	63.43	--	1.75	1.75	17.54	78.95
Intermediate	295	65.94	--	1.36	7.46	20.00	71.19
Advanced	802	70.74	0.75	3.99	18.70	31.05	45.51
Initially English Proficient	15	72.87	--	--	26.67	46.67	26.67
Title III First Year Exited	251	75.54	2.79	9.96	30.28	36.65	20.32
Title III Second + Year Exited	108	76.84	2.78	18.52	27.78	30.56	20.37
English Speaker I	370	77.79	6.76	19.73	24.59	31.35	17.57
English Speaker II	44,106	72.81	3.05	10.39	21.19	26.38	38.98
Other	1,295	72.03	2.70	12.59	19.92	21.16	43.63
<b>Lunch</b>							
Free meals	18,806	68.84	0.83	4.22	14.13	25.31	55.50
Reduced-price meals	3,056	71.65	1.57	8.18	19.40	27.55	43.29
No free/reduced-price meals	25,631	75.70	4.75	15.07	26.28	26.92	26.97
<b>IEP</b>							
Yes	3,597	65.24	0.50	2.20	7.45	18.02	71.84
No	43,896	73.33	3.20	11.00	22.14	27.01	36.65
<b>Migrant</b>							
Yes	8	--	--	--	--	--	--
No	47,485	72.72	3.00	10.33	21.03	26.32	39.32
<b>Courses taken</b>							
3320 (US Hst of Const. or College Prep US Hst)	42,598	71.48	1.66	7.70	19.69	27.76	43.18
3372 (AP US Hst)	4,489	83.92	15.24	33.88	32.59	13.46	4.83
336D (IB Hst of Americas)	287	82.59	8.71	31.71	39.02	17.77	2.79
Other	119	71.63	4.20	11.76	21.85	17.65	44.54

**Table 5.7**  
**US History and Constitution Operational Test, Grades 6-12:**  
**Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics**

<b>Demographics</b>	<b>N</b>	<b>Mean Scale Score</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>F</b>
<b>Gifted/talented</b>							
Academic	4,569	80.62	8.05	25.32	35.57	22.21	8.84
Artistic	1,147	76.84	5.93	17.70	26.07	26.77	23.54
Both	369	82.19	11.38	29.54	35.50	16.53	7.05
No	41,408	71.65	2.28	8.30	19.16	26.85	43.40
<b>504 Plan</b>							
Yes	854	73.65	2.46	13.82	21.31	27.28	35.13
No	46,639	72.70	3.01	10.27	21.03	26.31	39.39
<b>Alternative school</b>							
Yes	717	65.83	0.42	1.67	9.76	19.25	68.90
No	46,776	72.83	3.04	10.46	21.20	26.43	38.86
<b>Accommodations</b>							
Yes	1,157	64.79	0.78	1.64	7.17	16.77	73.64
No	46,336	72.92	3.05	10.55	21.38	26.56	38.46

**Note:** Includes all students who attempted the test except home school students and students in an adult education program.  
If the number tested is less than 10, no other statistics appear.

**Table 5.8**  
**US History and Constitution Operational Test, Adult Education Programs:**  
**Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics**

<b>Demographics</b>	<b>N</b>	<b>Mean Scale Score</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>F</b>
<b>Overall</b>	75	63.56	--	--	1.33	16.00	82.67
<b>Gender</b>							
Female	37	63.32	--	--	--	16.22	83.78
Male	34	63.71	--	--	2.94	14.71	82.35
Unknown	4	--	--	--	--	--	--
<b>Ethnicity</b>							
Hispanic or Latino	4	--	--	--	--	--	--
American Indian or Alaska Native	1	--	--	--	--	--	--
Black or African American	23	59.91	--	--	--	4.35	95.65
Native Hawaiian or Other Pacific Islander	1	--	--	--	--	--	--
White	17	65.35	--	--	--	29.41	70.59
Other	29	65.41	--	--	3.45	17.24	79.31
<b>Language</b>							
Other	75	63.56	--	--	1.33	16.00	82.67
<b>Lunch</b>							
Free meals	6	--	--	--	--	--	--
No free/reduced-price meals	69	63.65	--	--	1.45	14.49	84.06
<b>IEP</b>							
Yes	1	--	--	--	--	--	--
No	74	63.55	--	--	1.35	16.22	82.43
<b>Migrant</b>							
No	75	63.56	--	--	1.33	16.00	82.67
<b>Courses taken</b>							
3320 (US Hst of Const. or College Prep US Hst)	75	63.56	--	--	1.33	16.00	82.67
<b>Gifted/talented</b>							
No	75	63.56	--	--	1.33	16.00	82.67
<b>504 Plan</b>							
No	75	63.56	--	--	1.33	16.00	82.67
<b>Alternative school</b>							
No	75	63.56	--	--	1.33	16.00	82.67
<b>Accommodations</b>							
No	75	63.56	--	--	1.33	16.00	82.67

**Note:** Includes all students who attempted the test and are in an adult education program except home school students.  
If the number tested is less than 10, no other statistics appear.

## CHAPTER 6

### DESCRIPTIVE STATISTICS

Descriptive statistics of scale score distributions for the three test administrations of the current year combined are presented in table 6 for students overall and by gender and race.

**TABLE 6**  
**2012–13 EOCEP Test Administration Summary Statistics: Grades 6-12 and Adult**  
**Education Programs, Overall and by Gender, Race, and Accommodations**

<b>Algebra 1/Math Tech 2</b>							
<b>Grades 6-12</b>				<b>Adult Education Programs</b>			
	<b>N</b>	<b>Scale Score</b>			<b>N</b>	<b>Scale Score</b>	
		<b>Mean</b>	<b>SD</b>			<b>Mean</b>	<b>SD</b>
<b>Overall</b>	56,791	80.63	11.10	<b>Overall</b>	22	69.14	8.78
<b>Gender</b>				<b>Gender</b>			
Female	27,784	81.34	10.83	Female	9	66.67	5.00
Male	28,621	80.04	11.30	Male	8	74.00	11.44
<b>Ethnicity</b>				<b>Ethnicity</b>			
African-American	19,156	76.15	9.83	African-American	2	69.00	5.66
White	31,497	83.31	10.92	White	2	67.00	8.49
<b>Accommodations</b>				<b>Accommodations</b>			
No	55,398	80.86	11.05	No	22	69.14	8.78
Yes	1,393	71.80	9.22	Yes	0	--	--

  

<b>Biology</b>							
<b>Grades 6-12</b>				<b>Adult Education Programs</b>			
	<b>N</b>	<b>Scale Score</b>			<b>N</b>	<b>Scale Score</b>	
		<b>Mean</b>	<b>SD</b>			<b>Mean</b>	<b>SD</b>
<b>Overall</b>	52,589	81.33	14.03	<b>Overall</b>	22	69.68	12.55
<b>Gender</b>				<b>Gender</b>			
Female	25,758	81.43	13.52	Female	12	65.25	9.46
Male	26,429	81.27	14.48	Male	5	79.40	13.96
<b>Ethnicity</b>				<b>Ethnicity</b>			
African-American	17,746	74.49	12.82	African-American	4	59.75	9.60
White	29,224	85.65	12.96	White	5	74.00	12.94
<b>Accommodations</b>				<b>Accommodations</b>			
No	50,932	81.78	13.83	No	22	69.68	12.55
Yes	1,657	67.54	12.87	Yes	0	--	--

**TABLE 6**  
**2012–13 EOCEP Test Administration Summary Statistics: Grades 6-12 and Adult**  
**Education Programs, Overall and by Gender, Race, and Accommodations**

<b>English 1</b>							
<b>Grades 6-12</b>				<b>Adult Education Programs</b>			
	<b>N</b>	<b>Scale Score</b>			<b>N</b>	<b>Scale Score</b>	
		<b>Mean</b>	<b>SD</b>			<b>Mean</b>	<b>SD</b>
<b>Overall</b>	55,797	77.92	11.57	<b>Overall</b>	5	71.00	10.20
<b>Gender</b>				<b>Gender</b>			
Female	27,093	79.03	11.26	Female	1	69.00	0.00
Male	28,340	76.94	11.74	Male	4	71.50	11.70
<b>Ethnicity</b>				<b>Ethnicity</b>			
African-American	18,821	72.81	10.37	African-American	2	77.00	1.41
White	30,862	81.31	10.91	White	1	54.00	0.00
<b>Accommodations</b>				<b>Accommodations</b>			
No	54,271	78.25	11.43	No	5	71.00	10.20
Yes	1,526	66.21	10.48	Yes	0	--	--

  

<b>US History and Constitution</b>							
<b>Grades 6-12</b>				<b>Adult Education Programs</b>			
	<b>N</b>	<b>Scale Score</b>			<b>N</b>	<b>Scale Score</b>	
		<b>Mean</b>	<b>SD</b>			<b>Mean</b>	<b>SD</b>
<b>Overall</b>	47,493	72.72	9.99	<b>Overall</b>	75	63.56	6.31
<b>Gender</b>				<b>Gender</b>			
Female	23,647	71.81	9.50	Female	37	63.32	5.88
Male	23,476	73.68	10.37	Male	34	63.71	6.99
<b>Ethnicity</b>				<b>Ethnicity</b>			
African-American	16,350	68.07	8.38	African-American	23	59.91	6.08
White	26,212	75.60	9.82	White	17	65.35	5.50
<b>Accommodations</b>				<b>Accommodations</b>			
No	46,336	72.92	9.94	No	75	63.56	6.31
Yes	1,157	64.79	8.53	Yes	0	--	--

**Note:** Includes all students who attempted the test except home school students.



## CHAPTER 7

### RELIABILITY

In this chapter, multiple types of reliability indexes are presented. For the total tests, two measures of the reliability of raw scores and the classical standard error of measurement (SEM) are given. At the passing cut scores, conditional standard errors of measurement (CSEM) for raw scores, for scale scores, and measures of decision consistency were determined.

#### 7.1 RELIABILITY OF RAW SCORES

Table 7.1 reports the reliability coefficients and SEMs. The reliabilities of the total raw scores were computed using the Kuder-Richardson formulas 20 (KR20) and 21 (KR21). The KR21 reliability coefficients were used in computing the CSEM for the raw scores shown below, in section 7.2.

**Table 7.1**  
**Reliability Coefficients of Raw Scores**

<b>Administration</b>	<b>Number of Items</b>	<b>Number of Test Takers</b>	<b>KR-20</b>	<b>KR-21</b>	<b>Classical SEM</b>
<b>Algebra 1/Mathematics for the Technologies 2</b>					
Fall 2012	50	8,370	0.837	0.811	4.053
Spring 2013	50	39,252	0.870	0.844	4.065
Summer 2013	50	115	0.767	0.730	4.177
<b>Biology</b>					
Fall 2012	60	13,425	0.888	0.876	4.481
Spring 2013	60	39,075	0.902	0.893	4.444
Summer 2013	60	50	0.887	0.874	4.730
<b>English 1</b>					
Fall 2012	55	7,527	0.865	0.848	3.949
Spring 2013	55	48,131	0.879	0.863	4.036
Summer 2013	55	93	0.886	0.868	4.090
<b>US History and Constitution</b>					
Fall 2012	55	10,865	0.863	0.844	3.477
Spring 2013	55	36,554	0.876	0.862	3.558
Summer 2013	55	50	0.837	0.825	3.475

**Note:** Includes all students who attempted the test using a complete regular form except home school students and students in an adult education program.

#### 7.2 OVERALL AND CONDITIONAL SEM

The overall classical SEM is defined as  $s_x\sqrt{1-r_{xx}}$ , where  $s_x$  is the standard deviation of the scale score and  $r_{xx}$  is the reliability coefficient. The CSEM for raw scores at the cut score was computed using the following formula (Feldt and Qualls 1998; Huynh, Meyer, and Barton 2000):

$$\text{raw score CSEM} = \sqrt{\left(\frac{1-KR20}{1-KR21}\right)\left(\frac{c(k-c)}{k-1}\right)}, \text{ where } c = \text{cut score and } k = \text{number of items.}$$

The scale score CSEM at the passing cut score was computed on the basis of the conditional standard error of the Rasch ability cut score. The scale score CSEM is defined as the reciprocal of the square root of the test information function at the point on the ability continuum that corresponds to the scale score cut (Hambleton, Swaminathan, and Rogers 1991). Although classical and conditional SEMs serve similar roles, the values of the conditional standard errors are determined separately for each possible test score, while the classical SEM is a single value used for all scores. Table 7.2 presents both the raw score and scale score CSEMs.

**TABLE 7.2**  
**2012–13 EOCEP Conditional Standard Errors of Measurement**

<b>Administration</b>	<b>Raw Scores</b>	<b>Scale Scores</b>
<b>Algebra/ Mathematics for the Technologies 2</b>		
Fall 2012	3.278	4.282
Spring 2013	3.235	4.202
Summer 2013	3.292	4.276
<b>Biology</b>		
Fall 2012	3.694	4.378
Spring 2013	3.727	4.405
Summer 2013	3.694	4.365
<b>English 1</b>		
Fall 2012	3.428	4.342
Spring 2013	3.437	4.317
Summer 2013	3.423	4.271
<b>US History and Constitution</b>		
Fall 2012	3.512	4.323
Spring 2013	3.549	4.368
Summer 2013	3.609	4.443

**Note:** Includes all students who attempted the test using a complete regular form except home school students and students in an adult education program.

### 7.3 CONSISTENCY OF PASSING CUT SCORES

When student performance is reported in a pass or fail category, a reliability index is computed in terms of the probabilities of consistent classification of students, as specified in standard 2.15 in *Standards for Educational and Psychological Testing* (AERA, APA, and NCME 1999). This index takes into consideration the consistency of classifications for the percentage of examinees who would be classified in the same way on a second (hypothetical) EOCEP administration using either the same form or an alternate equivalent form.

Although a number of procedures are available for estimating classification errors (Livingston and Lewis 1995; Hanson and Brennan 1990; Huynh 1976; Subkoviak 1976), DRC used the *beta* binomial distribution method (Huynh 1979; Huynh, Meyer, and Barton 2000). Table 7.3 presents a summary of agreements between the operational test classifications—that is, the percentages of students who would be consistently classified in the same category (pass or fail) on two equivalent administrations of the test. The consistency index for the passing score is computed for each administration.

**TABLE 7.3**  
**2012–13 EOCEP Consistency Index for Passing Scores**

<b>Administration</b>	<b>Consistency Index</b>
<b>Algebra/ Mathematics for the Technologies 2</b>	
Fall 2012	87.100
Spring 2013	89.243
Summer 2013	79.188
<b>Biology</b>	
Fall 2012	89.872
Spring 2013	89.310
Summer 2013	85.914
<b>English 1</b>	
Fall 2012	85.707
Spring 2013	88.092
Summer 2013	84.039
<b>US History and Constitution</b>	
Fall 2012	82.729
Spring 2013	84.467
Summer 2013	81.882

**Note:** Includes all students who attempted the test using a complete regular form except home school students and students in an adult education program.

## CHAPTER 8

### VALIDITY

Three types of validity evidence are reported for the algebra test forms: test content, item fairness, and internal structure. Evidence of content validity is presented in the item content distribution across domains and the alignment of the current year's EOCEP test items with the state content standards. Evidence of item fairness is examined with the information on differential item functioning (DIF). Evidence of internal structure is provided in correlations among content domains.

#### 8.1 ITEM DISTRIBUTION ACROSS CONTENT DOMAINS

The EOCEP operational and implementation test forms were constructed according to the test specifications and the test blueprints. These items measured the specific assessment standards that were approved by the SCDE. All items in the test forms were reviewed by the content review committee and the sensitivity review committee and were approved by the SCDE. The current year's EOCEP test form specifications are presented in tables 8.1 through 8.4 by subject.

**Table 8.1**  
**Item Distribution by Content Domain for Algebra 1/Math Tech 2**

<b>Content Domain*</b>	<b>Fall</b>	<b>Spring</b>	<b>Summer</b>
EA-1	8	8	10
EA-2	9	6	9
EA-3	8	10	7
EA-4	12	11	10
EA-5	9	10	10
EA-6	4	5	4
<b>Totals</b>	<b>50</b>	<b>50</b>	<b>50</b>

\*EA-1: The student will understand and utilize the mathematical processes of problem solving, reasoning and proof, communication, connections, and representation

EA-2: The student will demonstrate through the mathematical processes an understanding of the real number system and operations involving exponents, matrices, and algebraic expressions.

EA-3: The student will demonstrate through the mathematical processes an understanding of relationships and functions.

EA-4: The student will demonstrate through the mathematical processes an understanding of the procedures for writing and solving linear equations and inequalities.

EA-5: The student will demonstrate through the mathematical processes an understanding of the graphs and characteristics of linear equations and inequalities.

EA-6: The student will demonstrate through the mathematical processes an understanding of quadratic relationships and functions.

**TABLE 8.2**  
**Item Distribution by Content Domain for Biology**

<b>Content Domain*</b>	<b>Fall</b>	<b>Spring</b>	<b>Summer</b>
B-1	11	11	11
B-2	9	9	9
B-3	10	10	10
B-4	11	11	11
B-5	9	9	9
B-6	10	10	10
<b>Totals</b>	<b>60</b>	<b>60</b>	<b>60</b>

\*B-1: The student will demonstrate an understanding of how scientific inquiry and technological design, including mathematical analysis, can be used appropriately to pose questions, seek answers, and develop solutions.

B-2: The student will demonstrate an understanding of the structure and function of cells and their organelles.

B-3: The student will demonstrate an understanding of the flow of energy within and between living systems.

B-4: The student will demonstrate a understanding of the molecular basis of heredity.

B-5: The student will demonstrate an understanding of biological evolution and the diversity of life.

B-6: The student will demonstrate an understanding of the interrelationships among organisms and the biotic and abiotic components of their environments.

**Table 8.3**  
**Item Distribution by Content Domain for English 1**

<b>Content Domain*</b>	<b>Fall</b>	<b>Spring</b>	<b>Summer</b>
E1-1	27	21	20
E1-2	3	6	9
E1-3	4	5	7
E1-4	10	11	11
E1-6	11	12	8
<b>Totals</b>	<b>55</b>	<b>55</b>	<b>55</b>

\*E1-1: The student will read and comprehend a variety of literary texts in print and nonprint formats.

E1-2: The student will read and comprehend a variety of informational texts in print and nonprint formats.

E1-3: The student will use word analysis and vocabulary strategies to read fluently.

E1-4: The student will create written work that has a clear focus, sufficient detail, coherent organization, effective use of voice, and correct use of the conventions of written Standard American English.

E1-6: The student will access and use information from a variety of sources.

**TABLE 8.4****Item Distribution by Content Domain for US History and Constitution**

<b>Content Domain*</b>	<b>Fall</b>	<b>Spring</b>	<b>Summer</b>
USHC-1	9	7	2
USHC-2	4	7	8
USHC-3	7	6	4
USHC-4	8	7	5
USHC-5	6	6	7
USHC-6	6	7	5
USHC-7	8	9	8
USHC-8	7	6	6
USHC-9	0	0	8
USCH-10	0	0	2
<b>Totals</b>	<b>55</b>	<b>55</b>	<b>55</b>

\*USHC-1: The student will demonstrate an understanding of the settlement of North America.

USHC-2: The student will demonstrate an understanding of the establishment of the United States as a new nation.

USHC-3: The student will demonstrate an understanding of the westward movement and the resulting regional conflicts that took place in America in the nineteenth century.

USHC-4: The student will demonstrate an understanding of the causes and the course of the Civil War and Reconstruction in America.

USHC-5: The student will demonstrate an understanding of major social, political, and economic developments that took place in the United States during the second half of the nineteenth century.

USHC-6: The student will demonstrate an understanding of foreign developments that contributed to the United States' emergence as a world power in the twentieth century.

USHC-7: The student will demonstrate an understanding of the economic boom-and-bust in America in the 1920s and 1930s, in resultant political instability, and the subsequent worldwide response.

USHC-8: The student will demonstrate an understanding of the impact of World War II on United States' foreign and domestic policies.

USHC-9: The student will demonstrate an understanding of the social, economic, and political events that impacted the United States during the Civil War era.

USHC-10: The student will demonstrate an understanding of developments in foreign policy and economics that have taken place in the United States since the fall of the Soviet Union and its satellite states in 1992.

## 8.2 ITEM DEVELOPMENT

All EOCEP items were developed with reference to the South Carolina academic standards and measurement guidelines. Various committees reviewed all items; items approved by these committees and the SCDE were field-tested. Items demonstrating satisfactory performance on field tests became eligible for inclusion in operational forms.

## 8.3 DIFFERENTIAL ITEM FUNCTIONING

A critical issue in statewide high-stakes testing is whether the test is fair to all test-takers; therefore, an important goal of item and test development is to produce a pool of items that are judged to be free of bias either toward or against any group of students. All EOCEP items were reviewed both for bias and for differential item functioning (DIF).

The sensitivity review committee examined the EOCEP items for potential bias, including language that might disadvantage a particular group, might be considered offensive to members of a particular group, or might present obstacles to a particular group due to factors unrelated to content and processes specified in the standards.

As with other statistical methodologies, there are numerous widely accepted approaches to detecting potential unfairness in test items. Many of these methods fall into the general category of DIF analyses. DIF statistics provide information regarding relative group performance at the item level for gender and ethnic comparisons while controlling for ability. Once an item is flagged for a significant DIF, judgment is used to determine whether the difference in difficulty shown by the DIF index is unfairly related to group membership. The DIF statistics do not necessarily indicate bias or unfairness in an item but may simply show the relative strengths and weaknesses of the two groups being compared after the overall ability that the test is intended to measure has been controlled for.

### **Procedure:**

The procedure that DRC selected for detecting DIF was the Mantel-Haenszel (MH) chi-square for dichotomous items. DRC calculated the Mantel-Haenszel statistic (MH D-DIF) for MC items (Holland and Thayer 1988) to measure the degree and magnitude of DIF. The examinee group of interest is the *focal* group, and the group to which performance on the item is being compared is the *reference* group. In this report, the focal groups for DIF were females and African Americans.

Items were separated into one of three categories on the basis of DIF statistics (Holland and Thayer 1988; Dorans and Holland 1993): negligible DIF (category A), intermediate DIF (category B), and large DIF (category C). The items in category C, which exhibit significant DIF, are of primary concern.

Positive values of *delta* indicate that the item is easier for the *focal* group, suggesting that the item favors the *focal* group. A negative value of *delta* indicates that the item is more difficult for the *focal* group. The item classifications are based on the Mantel-Haenszel chi-square and the MH delta ( $\Delta$ ) value as follows:

- The item is classified as C category if the absolute value of the MH delta value (i.e.,  $|\Delta|$ ) is significantly greater than 1 and also greater than or equal to 1.5.
- The item is classified as B category if the MH delta value ( $\Delta$ ) is significantly different from 0 and either the absolute value of the MH delta ( $|\Delta|$ ) is less than 1.5 or the absolute value of the MH delta ( $|\Delta|$ ) is not significantly different from 1.
- The item is classified as A category if delta value ( $\Delta$ ) is not significantly different from 0 or the absolute value of delta ( $|\Delta|$ ) is less than or equal to 1.

The data in table 8.5, below, summarize the number of items in DIF categories for the current year's operational test items.

When the operational forms were constructed, all item statistics from the initial field test were reviewed and approved by the SCDE. Due to the large number of items subjected to DIF analyses, erroneous flags could be expected. All flagged items were closely examined by the SCDE. Inclusion of any flagged item on an operational form (i.e., an item classified as C category) was possible only when the SCDE had approved that item.

**Table 8.5**  
**Summary of Differential Item Functioning for Operational Items**

Administration	Cat	Whites/African-Americans				Males/Females			
		Alg	Bio	Eng	USHC	Alg	Bio	Eng	USHC
Fall 2012	A+	23	22	23	22	29	35	34	26
	A-	22	35	30	31	16	24	16	25
	B+	0	0	1	0	1	0	3	1
	B-	3	3	1	2	4	0	2	3
	C+	0	0	0	0	0	1	0	0
	C-	2	0	0	0	0	0	0	0
Spring 2013	A+	23	23	22	16	29	30	30	27
	A-	25	35	29	37	20	30	23	27
	B+	0	0	0	1	0	0	2	0
	B-	1	2	4	1	1	0	0	1
	C+	0	0	0	0	0	0	0	0
	C-	1	0	0	0	0	0	0	0
Summer 2013*	A+	--	--	--	--	--	--	--	--
	A-	--	--	--	--	--	--	--	--
	B+	--	--	--	--	--	--	--	--
	B-	--	--	--	--	--	--	--	--
	C+	--	--	--	--	--	--	--	--
	C-	--	--	--	--	--	--	--	--

\*Due to low N counts, DIF was not calculated for the summer administrations

**Note:** Includes all students who attempted the test using a regular form except home school students and students in an adult education program.



## 8.4 CORRELATIONS AMONG CONTENT DOMAINS

Evidence of internal structure was examined using correlations among content domains. On the following pages, tables 8.6 through 8.9 report the correlation matrices for the raw scores among content domains for each test.

**Table 8.6**  
**Correlations among Domain Scores for Algebra 1/Math Tech 2**

Domain	EA-1	EA-2	EA-3	EA-4	EA-5	EA-6	Number of Items
<b>Fall 2012 (N=8,370)</b>							
<b>EA-1</b>	1	0.462	0.374	0.490	0.433	0.326	8
<b>EA-2</b>	—	1	0.431	0.577	0.458	0.379	9
<b>EA-3</b>	—	—	1	0.468	0.382	0.328	8
<b>EA-4</b>	—	—	—	1	0.507	0.423	12
<b>EA-5</b>	—	—	—	—	1	0.339	9
<b>EA-6</b>	—	—	—	—	—	1	4
<b>Spring 2013 (N=39,252)</b>							
<b>EA-1</b>	1	0.454	0.480	0.523	0.509	0.405	8
<b>EA-2</b>	—	1	0.521	0.574	0.517	0.412	6
<b>EA-3</b>	—	—	1	0.583	0.543	0.435	10
<b>EA-4</b>	—	—	—	1	0.625	0.454	11
<b>EA-5</b>	—	—	—	—	1	0.421	10
<b>EA-6</b>	—	—	—	—	—	1	5
<b>Summer 2013 (N=115)</b>							
<b>EA-1</b>	1	0.432	0.111	0.404	0.381	-0.005	10
<b>EA-2</b>	—	1	0.349	0.456	0.455	0.201	9
<b>EA-3</b>	—	—	1	0.209	0.346	0.110	7
<b>EA-4</b>	—	—	—	1	0.533	0.163	10
<b>EA-5</b>	—	—	—	—	1	0.130	10
<b>EA-6</b>	—	—	—	—	—	1	4

**Note:** Includes all students who attempted the test using a complete regular form except home school students and students in an adult education program.

**Table 8.7**  
**Correlations among Domain Scores for Biology**

<b>Domain</b>	<b>B-1</b>	<b>B-2</b>	<b>B-3</b>	<b>B-4</b>	<b>B-5</b>	<b>B-6</b>	<b>Number of Items</b>
<b>Fall 2012 (N=13,425)</b>							
<b>B-1</b>	1	0.554	0.529	0.545	0.538	0.576	11
<b>B-2</b>	—	1	0.545	0.563	0.531	0.564	9
<b>B-3</b>	—	—	1	0.546	0.522	0.545	10
<b>B-4</b>	—	—	—	1	0.535	0.562	11
<b>B-5</b>	—	—	—	—	1	0.581	9
<b>B-6</b>	—	—	—	—	—	1	10
<b>Spring 2013 (N=39,075)</b>							
<b>B-1</b>	1	0.602	0.512	0.566	0.613	0.607	11
<b>B-2</b>	—	1	0.544	0.620	0.597	0.609	9
<b>B-3</b>	—	—	1	0.522	0.520	0.517	10
<b>B-4</b>	—	—	—	1	0.579	0.585	11
<b>B-5</b>	—	—	—	—	1	0.621	9
<b>B-6</b>	—	—	—	—	—	1	10
<b>Summer 2013 (N=50)</b>							
<b>B-1</b>	1	0.399	0.503	0.512	0.636	0.700	11
<b>B-2</b>	—	1	0.581	0.390	0.572	0.605	9
<b>B-3</b>	—	—	1	0.505	0.553	0.592	10
<b>B-4</b>	—	—	—	1	0.669	0.537	11
<b>B-5</b>	—	—	—	—	1	0.691	9
<b>B-6</b>	—	—	—	—	—	1	10

**Note:** Includes all students who attempted the test using a regular form except home school students and students in an adult education program.

**Table 8.8**  
**Correlations among Domain Scores for English 1**

<b>Domain</b>	<b>E1-1</b>	<b>E1-2</b>	<b>E1-3</b>	<b>E1-4</b>	<b>E1-6</b>	<b>Number of Items</b>
<b>Fall 2012 (N=7,527)</b>						
<b>E1-1</b>	1	0.551	0.356	0.543	0.644	27
<b>E1-2</b>	—	1	0.256	0.412	0.465	3
<b>E1-3</b>	—	—	1	0.232	0.308	4
<b>E1-4</b>	—	—	—	1	0.453	10
<b>E1-6</b>	—	—	—	—	1	11
<b>Spring 2013 (N=48,131)</b>						
<b>E1-1</b>	1	0.503	0.545	0.654	0.642	21
<b>E1-2</b>	—	1	0.380	0.450	0.436	6
<b>E1-3</b>	—	—	1	0.487	0.474	5
<b>E1-4</b>	—	—	—	1	0.585	11
<b>E1-6</b>	—	—	—	—	1	12
<b>Summer 2013 (N=93)</b>						
<b>E1-1</b>	1	0.566	0.590	0.749	0.640	20
<b>E1-2</b>	—	1	0.438	0.644	0.545	9
<b>E1-3</b>	—	—	1	0.551	0.438	7
<b>E1-4</b>	—	—	—	1	0.618	11
<b>E1-6</b>	—	—	—	—	1	8

**Note:** Includes all students who attempted the test using a regular form except home school students and students in an adult education program.

**Table 8.9**  
**Correlations among Domain Scores for US History and Constitution**

Domain	USHC-1	USHC-2	USHC-3	USHC-4	USHC-5	USHC-6	USHC-7	USHC-8	USHC-9	USHC-10	Number of Items
<b>Fall 2012 (N=10,865)</b>											
USHC-1	1	0.466	0.512	0.419	0.515	0.508	0.507	0.410	—	—	9
USHC-2	—	1	0.427	0.354	0.440	0.421	0.409	0.319	—	—	4
USHC-3	—	—	1	0.410	0.484	0.461	0.476	0.393	—	—	7
USHC-4	—	—	—	1	0.390	0.408	0.399	0.330	—	—	8
USHC-5	—	—	—	—	1	0.481	0.501	0.382	—	—	6
USHC-6	—	—	—	—	—	1	0.477	0.385	—	—	6
USHC-7	—	—	—	—	—	—	1	0.401	—	—	8
USHC-8	—	—	—	—	—	—	—	1	—	—	7
USHC-9	—	—	—	—	—	—	—	—	—	—	0
USHC-10	—	—	—	—	—	—	—	—	—	—	0
<b>Spring 2013 (N=36,554)</b>											
USHC-1	1	0.458	0.408	0.498	0.486	0.441	0.546	0.491	—	—	7
USHC-2	—	1	0.383	0.450	0.442	0.408	0.505	0.433	—	—	7
USHC-3	—	—	1	0.408	0.391	0.376	0.455	0.393	—	—	6
USHC-4	—	—	—	1	0.480	0.449	0.537	0.485	—	—	7
USHC-5	—	—	—	—	1	0.442	0.537	0.479	—	—	6
USHC-6	—	—	—	—	—	1	0.497	0.440	—	—	7
USHC-7	—	—	—	—	—	—	1	0.554	—	—	9
USHC-8	—	—	—	—	—	—	—	1	—	—	6
USHC-9	—	—	—	—	—	—	—	—	—	—	0
USHC-10	—	—	—	—	—	—	—	—	—	—	0
<b>Summer 2013 (N=50)</b>											
USHC-1	1	.213	.309	-.013	.239	.028	.087	.382	.229	.224	2
USHC-2	—	1	.574	.270	.442	.405	.595	.400	.555	.098	8
USHC-3	—	—	1	.134	.510	.406	.544	.493	.529	.057	4
USHC-4	—	—	—	1	-.005	.351	.392	.030	.252	.380	5
USHC-5	—	—	—	—	1	.354	.357	.508	.558	.351	7
USHC-6	—	—	—	—	—	1	.502	.335	.495	.332	5
USHC-7	—	—	—	—	—	—	1	.410	.559	.133	8
USHC-8	—	—	—	—	—	—	—	1	.458	.225	6
USHC-9	—	—	—	—	—	—	—	—	1	.312	8
USHC-10	—	—	—	—	—	—	—	—	—	1	2

**Note:** Includes all students who attempted the test using a regular form except home school students and students in an adult education program.

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