

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

**2008–09 OPERATIONAL TEST TECHNICAL REPORT**



South Carolina  
Department of Education

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Together, we can.

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

**Office of Assessment  
Division of Accountability**

**Jim Rex  
State Superintendent of Education**

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## CHAPTER 1

### HISTORY AND OVERVIEW

The South Carolina Education Accountability Act of 1998 requires the development of end-of-course examinations in gateway, or benchmark, courses for grades nine through twelve. When the program is fully implemented, all students enrolled in End-of-Course Examination Program (EOCEP) courses will take the tests for those courses: Algebra 1, Mathematics for the Technologies 2, English 1, Physical Science, Biology 1, Applied Biology 2, and U.S. History and the Constitution.

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 will be 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. However, the State Board of Education decided to reinstate the Biology test. This reinstatement of the Biology test began in the spring of 2008 with a field test. Additional field testing was conducted in spring 2009. The 2009–10 school year will be an implementation year for Biology. After the Biology test gains full approval, the Physical Science test will be discontinued. 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). These contractors have undertaken a number of development, review, implementation, and data analysis activities. In spring 2007, Pearson became the sole contractor. In fall 2008, Data Recognition Corporation (DRC) took over administration, while Pearson remained the development contractor.

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 the regular schools and in 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 the students who completed courses for Algebra 1, Mathematics for the Technologies 2, Biology 1, Applied Biology 2, Physical Science, U.S. History and the Constitution, or English 1 for credit toward a high school diploma. 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 fluency (LEP, limited English proficiency), lunch program participation, individualized education program (IEP) 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 Student Demographics in the Sample**

Demographics	Algebra 1/ Math Tech 2		English 1		Physical Science		US Hist. & Const.	
	N	%	N	%	N	%	N	%
<b>Overall</b>	59,250	100.00	56,333	100.00	53,984	100.00	47,667	100.00
<b>Gender</b>								
Female	29,725	50.17	28,446	50.50	27,051	50.11	22,910	48.06
Male	29,162	49.22	27,435	48.70	26,717	49.49	24,615	51.64
Unknown	363	0.61	452	0.80	216	0.40	142	0.30
<b>Grade</b>								
6	13	0.02	0	0.00	2	0.00	0	0.00
7	2,500	4.22	3	0.01	0	0.00	0	0.00
8	12,876	21.73	8,500	15.09	519	0.96	1	0.00
9	30,422	51.35	46,901	83.26	35,077	64.98	637	1.34
10	12,003	20.26	695	1.23	16,150	29.92	5,983	12.55
11	1,082	1.83	121	0.21	1,662	3.08	37,892	79.49
12	280	0.47	37	0.07	499	0.92	3,045	6.39
Adult education	36	0.06	7	0.01	15	0.03	63	0.13
Other	38	0.06	69	0.12	60	0.11	46	0.10
<b>Ethnicity</b>								
White	31,965	53.95	30,019	53.29	28,720	53.20	26,227	55.02
African-American	22,287	37.62	21,267	37.75	20,934	38.78	17,909	37.57
Hispanic	2,458	4.15	2,444	4.34	2,208	4.09	1,744	3.66
Asian/Pacific Islander	721	1.22	709	1.26	675	1.25	645	1.35
American Indian	128	0.22	104	0.18	71	0.13	82	0.17
Other	1,038	1.75	980	1.74	919	1.70	663	1.39
Unknown	653	1.10	810	1.44	457	0.85	397	0.83

**Table 2.1**  
**Summary of Student Demographics in the Sample**

<b>Language</b>								
Parent waiver	84	0.14	67	0.12	70	0.13	96	0.20
Pre-functional	224	0.38	295	0.52	215	0.40	100	0.21
Beginner	230	0.39	256	0.45	227	0.42	152	0.32
Intermediate	435	0.73	438	0.78	382	0.71	238	0.50
Advanced	690	1.16	654	1.16	545	1.01	326	0.68
Initially English Proficient	111	0.19	111	0.20	112	0.21	80	0.17
Title III First Year Exited	19	0.03	9	0.02	7	0.01	21	0.04
Title III Second + Year Exited	140	0.24	133	0.24	149	0.28	124	0.26
English Speaker I	185	0.31	168	0.30	173	0.32	226	0.47
English Speaker II	55,517	93.70	52,486	93.17	50,790	94.08	45,222	94.87
Other	1,615	2.73	1,716	3.05	1,314	2.43	1,082	2.27
<b>Lunch</b>								
Free meals	23,248	39.24	22,987	40.81	21,492	39.81	16,552	34.72
Reduced-price meals	4,505	7.60	4,240	7.53	4,026	7.46	3,264	6.85
No free/reduced-price meals	31,497	53.16	29,106	51.67	28,466	52.73	27,851	58.43
<b>IEP</b>								
Yes	5,177	8.74	5,462	9.70	5,714	10.58	3,521	7.39
No	54,073	91.26	50,871	90.30	48,270	89.42	44,146	92.61
<b>Migrant</b>								
Yes	14	0.02	16	0.03	9	0.02	8	0.02
No	59,236	99.98	56,317	99.97	53,975	99.98	47,659	99.98
<b>Gifted/talented</b>								
Academic	9,824	16.58	8,625	15.31	7,297	13.52	4,386	9.20
Artistic	702	1.18	614	1.09	497	0.92	581	1.22
Both	814	1.37	636	1.13	270	0.50	166	0.35
No	47,910	80.86	46,458	82.47	45,920	85.06	42,534	89.23
<b>504 plan</b>								
Yes	711	1.20	660	1.17	632	1.17	554	1.16
No	58,539	98.80	55,673	98.83	53,352	98.83	47,113	98.84
<b>Alternative school</b>								
Yes	909	1.53	1,109	1.97	949	1.76	521	1.09
No	58,341	98.47	55,224	98.03	53,035	98.24	47,146	98.91
<b>Accommodations</b>								
Yes	2,293	3.87	2,383	4.23	2,870	5.32	1,556	3.26
No	56,957	96.13	53,950	95.77	51,114	94.68	46,111	96.74

**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 the EOCEP test administration manuals (SCDE 2008b, 2009b, and 2009d). These manuals provide guidelines for IEP teams in making decisions about testing students with disabilities and gives specific information regarding testing accommodations and modifications, 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 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 plan team determines how a student with disabilities participates in the EOCEP assessments. Decisions about accommodations and modifications must be made on an individual student basis, not on the basis of the category of disability. Table 2.2 presents the percentages of accommodations used in the current year's testing.

**Table 2.2**  
**Accommodations Used in 2008–09 EOCEP Testing**

<b>Accommodations</b>	<b>Algebra 1/ Math Tech 2</b>	<b>English 1</b>	<b>Physical Science</b>	<b>US Hist. &amp; Const.</b>
<b>Regular Form</b>				
	<b>(N = 59,234)</b>	<b>(N = 56,313)</b>	<b>(N = 53,968)</b>	<b>(N = 47,646)</b>
Setting	3.59	3.94	4.77	2.93
Timing	0.15	0.16	0.29	0.14
Scheduling	0.07	0.06	0.08	0.07
Response options	0.06	0.10	0.12	0.04
Presentation	1.68	1.42	2.98	1.49
<b>Customized Form</b>				
	<b>(N = 16)</b>	<b>(N = 20)</b>	<b>(N = 16)</b>	<b>(N = 21)</b>
Setting	87.50	100.00	87.50	71.43
Timing	75.00	85.00	68.75	66.67
Scheduling	56.25	65.00	43.75	61.90
Response options	43.75	75.00	62.50	52.38
Presentation	87.50	95.00	93.75	76.19

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

Total responses in each column 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.) A large majority of students finished the test within two hours, as tables 2.3 and 2.4 reflect.

**Table 2.3**  
**Time Taken in 2008–09 EOCEP Testing with Regular Forms**

	Algebra 1/Math Tech 2			English 1		
	Fall 2008	Spring 2009	Summer 2009	Fall 2008	Spring 2009	Summer 2009
	(N = 9,303)	(N = 49,516)	(N = 415)	(N = 8,103)	(N = 47,933)	(N = 277)
Less than 15 min	0.05	0.05	0.24	0.07	0.04	--
15 min - 29 min	0.98	0.62	1.45	0.94	0.45	0.36
30 min - 44 min	4.68	2.79	6.02	4.42	2.41	5.78
45 min - 59 min	14.69	10.82	18.55	13.87	9.97	16.61
1 hr - 1 hr 14 min	25.59	21.53	21.93	25.87	21.51	13.72
1 hr 15 min - 1 hr 29 min	20.78	22.36	16.14	20.78	21.92	16.25
1 hr 30 min - 1 hr 44 min	12.20	16.08	14.70	12.93	15.67	15.88
1 hr 45 min - 1 hr 59 min	6.71	9.83	8.43	7.59	10.02	11.91
2 hr - 2 hr 14 min	4.08	5.78	6.02	4.49	6.54	9.03
2 hr 15 min - 2 hr 29 min	2.05	2.92	2.17	1.81	3.43	3.61
2 hr 30 min - 2 hr 44 min	0.95	1.62	0.96	0.95	1.89	1.44
2 hr 45 min - 2 hr 59 min	0.57	0.79	--	0.44	1.06	0.36
3 hr or more	0.61	1.40	0.96	0.42	1.23	--
Invalid*	6.05	3.42	2.41	5.41	3.86	5.05
	Physical Science			US History and Constitution		
	Fall 2008	Spring 2009	Summer 2009	Fall 2008	Spring 2009	Summer 2009
	(N = 13,803)	(N = 40,106)	(N = 59)	(N = 13,461)	(N = 34,117)	(N = 68)
Less than 15 min	0.04	0.09	--	0.10	0.09	1.47
15 min - 29 min	1.23	1.79	1.69	1.92	2.78	5.88
30 min - 44 min	9.11	14.40	23.73	15.47	20.40	33.82
45 min - 59 min	25.81	31.05	22.03	28.98	33.21	19.12
1 hr - 1 hr 14 min	29.03	26.68	18.64	27.24	22.96	20.59
1 hr 15 min - 1 hr 29 min	15.78	12.19	20.34	12.15	9.46	8.82
1 hr 30 min - 1 hr 44 min	6.69	5.18	10.17	5.13	3.60	2.94
1 hr 45 min - 1 hr 59 min	3.50	2.30	1.69	2.35	1.60	4.41
2 hr - 2 hr 14 min	1.56	1.04	--	1.00	0.77	--
2 hr 15 min - 2 hr 29 min	0.70	0.52	--	0.38	0.31	--
2 hr 30 min - 2 hr 44 min	0.47	0.27	--	0.17	0.13	--
2 hr 45 min - 2 hr 59 min	0.22	0.13	--	0.09	0.08	--
3 hr or more	0.58	0.23	--	0.13	0.09	--
Invalid*	5.28	4.11	1.69	4.90	4.52	2.94

\* 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**  
**Time Taken in 2008–09 EOCEP Testing with Customized Forms**

	Algebra 1/Math Tech 2			English 1		
	Fall 2008	Spring 2009	Summer 2009	Fall 2008	Spring 2009	Summer 2009
	(N = 3)	(N = 13)	(N = 0)	(N = 0)	(N = 20)	(N = 0)
45 min - 59 min	--	--	--	--	5.00	--
1 hr - 1 hr 14 min	--	--	--	--	5.00	--
1 hr 15 min - 1 hr 29 min	--	15.38	--	--	5.00	--
1 hr 30 min - 1 hr 44 min	33.33	38.46	--	--	--	--
1 hr 45 min - 1 hr 59 min	--	7.69	--	--	5.00	--
2 hr - 2 hr 14 min	33.33	7.69	--	--	10.00	--
2 hr 15 min - 2 hr 29 min	--	7.69	--	--	10.00	--
2 hr 30 min - 2 hr 44 min	--	15.38	--	--	--	--
3 hr or more	--	7.69	--	--	20.00	--
Invalid*	33.33	--	--	--	40.00	--
	Physical Science			US History and Constitution		
	Fall 2008	Spring 2009	Summer 2009	Fall 2008	Spring 2009	Summer 2009
	(N = 1)	(N = 15)	(N = 0)	(N = 7)	(N = 14)	(N = 0)
15 min - 29 min	--	--	--	--	7.14	--
30 min - 44 min	--	13.33	--	--	7.14	--
45 min - 59 min	--	6.67	--	--	21.43	--
1 hr - 1 hr 14 min	--	13.33	--	--	--	--
1 hr 15 min - 1 hr 29 min	--	6.67	--	--	7.14	--
1 hr 30 min - 1 hr 44 min	100.00	6.67	--	--	--	--
1 hr 45 min - 1 hr 59 min	--	20.00	--	14.29	--	--
2 hr - 2 hr 14 min	--	6.67	--	--	--	--
2 hr 15 min - 2 hr 29 min	--	--	--	--	14.29	--
2 hr 30 min - 2 hr 44 min	--	--	--	--	--	--
2 hr 45 min - 2 hr 59 min	--	--	--	--	14.29	--
3 hr or more	--	13.33	--	71.43	7.14	--
Invalid*	--	13.33	--	14.29	35.71	--

\* 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 customized form **except:** home school students.

## 2.4 STUDENT QUESTIONNAIRE

After the administration of the EOCEP test in United States History and the Constitution, 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 in the particular course, their use of calculators in the particular course (algebra only), and the amount of time they had spent engaged in lab activities in the particular course (biology and physical science only).

## CHAPTER 3

### TEST ADMINISTRATION

#### 3.1 TEST ADMINISTRATION WINDOW

The test administration dates for the current year are given in table 3, below. School districts were required to administer all EOCEP tests within a single five-day period. Districts were instructed to administer makeup tests following their regular testing period. For all three EOCEP administrations, district test coordinators (DTCs) were responsible for providing the testing schedule to all school test coordinators (STCs) in their particular districts.

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, school districts were required to have a five-day makeup period the week immediately following the original test administration. It was recommended that a single makeup test be given per day, but two could have been given per day if necessary.

**TABLE 3**  
**2008–09 EOCEP Test Administration Windows**

<b>Administration</b>	<b>Dates</b>
Fall 2008	Monday, Dec 8-Friday, Jan 23
Spring 2009	Friday, May 8-Friday, June 12
Summer 2009	Monday, June 22-Friday, July 31

#### 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 uninterrupted 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 2008a, 2009a, and 2009c) 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) were provided each fall and spring administration; the spring TAM is also used for general reference each summer. 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 use a form provided in the manuals to offer comments and suggestions on the procedures therein. The comments were provided to the SCDE to review and to use as the basis for potential changes in test procedures. The TAMs also included a testing irregularity form that test administrators were instructed to use to report any problems or deviations from established testing procedures.

Appendix C in the TAMs includes a detailed description of 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, Physical Science, English 1, and United States History and the Constitution:

- Loose-leaf test booklets—printed single-sided, one item to a page, and bound in three-ring binders—allowed individuals to remove the pages, if necessary, during testing.
- 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.
- Braille booklets were produced for students who typically read classroom materials in braille. The braille version was issued as spiral-bound booklet 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 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 gave specific directions to TAs regarding the appropriate way to read the test questions, the passages on which the questions were based, and the answer choices.

Beginning in spring 2005, audiocassettes were also produced to be used in the oral administration of the tests. These audiocassettes contained the directions for administering the tests, the passages that were the basis of the questions, the test questions, and the answer choices. The audiocassettes and the oral administration scripts contained the same information. In fall 2008, CD-ROMs replaced audiocassettes.

- Sign language videotapes—produced for Algebra 1/Mathematics for the Technologies 2, English 1, Biology 1/Applied Biology 2, and Physical Science—included the signed test directions, questions, and response options. The videotapes were produced in two languages: American Sign Language and Pidgin Signed English.

### 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 quickly 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, as they arrived from the schools. 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 district materials. These instructions listed the toll-free phone numbers of the trucking 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* (SCDE 2008b). Reprinted in the manual are 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 were locked in storage until the day of the test administration and were signed out when they were to be used, and signed in when they were returned. These materials were 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, on the following page, 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><i>p</i>-value</b>	<b>Adjusted Point-Biserial Correlation</b>
<b>Algebra 1/Math Tech 2</b>			
Fall 2008	50	0.507	0.294
Spring 2009	50	0.591	0.361
Summer 2009	50	0.471	0.283
<b>English 1</b>			
Fall 2008	55	0.626	0.331
Spring 2009	55	0.657	0.381
Summer 2009	55	0.568	0.343
<b>Physical Science</b>			
Fall 2008	55	0.552	0.375
Spring 2009	55	0.542	0.345
Summer 2009	55	0.439	0.293
<b>US History and Constitution</b>			
Fall 2008	55	0.459	0.262
Spring 2009	55	0.481	0.314
Summer 2009	55	0.433	0.288

**Note:** Includes all students who attempted the test using a 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 in the answer document. 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 regular 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, Regular Schools:**  
**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>	59,214	79.07	16.1	15.7	23.5	21.9	22.8
<b>Gender</b>							
Female	29,147	79.46	16.2	16.2	24.4	22.3	21.0
Male	29,704	78.77	16.2	15.4	22.7	21.5	24.2
Unknown	363	71.82	3.6	8.5	15.7	26.2	46.0
<b>Grade</b>							
6	13	95.54	76.9	7.7	7.7	7.7	--
7	2,500	92.58	59.2	21.7	14.2	3.8	1.2
8	12,876	88.35	39.4	25.3	22.3	9.9	3.1
9	30,422	76.86	8.8	14.9	25.4	24.7	26.3
10	12,003	72.57	2.0	7.1	22.1	30.9	37.9
11	1,082	72.94	2.2	9.9	21.2	28.9	37.8
12	280	75.40	6.4	10.4	26.1	28.9	28.2
Other	38	67.13	--	7.9	10.5	13.2	68.4
<b>Ethnicity</b>							
White	31,953	82.45	23.4	19.6	24.5	18.3	14.3
African-American	22,272	74.32	5.7	10.4	22.3	26.9	34.7
Hispanic	2,456	77.58	10.8	15.8	23.7	25.7	24.1
Asian/Pacific Islander	721	87.14	40.1	18.9	20.2	13.3	7.5
American Indian	128	76.42	10.9	8.6	26.6	23.4	30.5
Other	1,036	79.46	18.4	15.4	22.6	21.1	22.4
Unknown	648	72.16	3.4	8.0	17.1	27.8	43.7
<b>Language</b>							
Parent waiver	84	77.65	11.9	14.3	17.9	34.5	21.4
Pre-functional	224	69.11	3.6	3.1	11.6	23.7	58.0
Beginner	230	70.90	3.9	5.2	15.2	30.0	45.7
Intermediate	435	75.22	4.1	13.1	21.4	33.3	28.0
Advanced	690	81.79	18.0	21.3	26.7	22.0	12.0

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

<b>Language</b>							
Initially English Proficient	111	86.45	36.0	19.8	22.5	15.3	6.3
Title III First Year Exited	19	89.95	47.4	21.1	15.8	15.8	--
Title III Second + Year Exited	140	80.09	16.4	15.7	25.0	28.6	14.3
English Speaker I	185	85.11	30.3	23.2	23.8	10.8	11.9
English Speaker II	55,511	79.32	16.5	16.0	23.7	21.7	22.0
Other	1,585	71.54	4.6	6.5	17.6	24.9	46.4
<b>Lunch</b>							
Free meals	23,247	74.87	6.7	11.0	22.5	27.0	32.8
Reduced-price meals	4,505	78.29	12.0	15.6	26.1	23.9	22.3
No free/reduced-price meals	31,462	82.28	23.7	19.2	23.8	18.0	15.4
<b>IEP</b>							
Yes	5,177	70.24	2.5	5.4	14.6	26.6	50.9
No	54,037	79.92	17.4	16.7	24.3	21.5	20.1
<b>Migrant</b>							
Yes	14	69.93	--	--	21.4	28.6	50.0
No	59,200	79.07	16.1	15.7	23.5	21.9	22.8
<b>Courses taken</b>							
4111 (Alg 1)	45,176	81.12	20.5	18.5	24.1	18.9	18.0
3142 (Math for the Techs 2)	13,628	72.28	1.6	6.7	21.2	31.9	38.7
Other	410	78.61	15.1	12.7	25.6	23.2	23.4
<b>Gifted/talented</b>							
Academic	9,824	91.00	51.3	24.7	16.3	6.0	1.8
Artistic	702	81.29	17.8	20.7	26.8	20.8	14.0
Both	814	92.24	56.0	24.2	15.0	4.2	0.6
No	47,874	76.36	8.2	13.7	25.0	25.5	27.6
<b>504 plan</b>							
Yes	711	78.74	16.2	14.6	22.8	23.8	22.6
No	58,503	79.07	16.1	15.7	23.5	21.9	22.8
<b>Alternative school</b>							
Yes	905	68.36	1.7	3.1	10.9	25.1	59.2
No	58,309	79.24	16.3	15.9	23.7	21.9	22.2
<b>Accommodations</b>							
Yes	2,292	68.79	1.6	3.1	12.0	27.1	56.3
No	56,922	79.48	16.7	16.2	23.9	21.7	21.4

**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**

Demographics	N	Mean Scale Score	A	B	C	D	F
<b>Overall</b>	36	70.92	2.8	5.6	13.9	30.6	47.2
<b>Gender</b>							
Female	15	68.87	--	--	13.3	40.0	46.7
Male	21	72.38	4.8	9.5	14.3	23.8	47.6
<b>Ethnicity</b>							
White	12	75.50	8.3	--	25.0	50.0	16.7
African-American	15	67.13	--	--	--	26.7	73.3
Hispanic	2	81.50	--	50.0	50.0	--	--
Other	2	73.00	--	50.0	--	--	50.0
Unknown	5	66.20	--	--	20.0	20.0	60.0
<b>Language</b>							
English Speaker II	6	70.33	--	--	33.3	33.3	33.3
Other	30	71.03	3.3	6.7	10.0	30.0	50.0
<b>Lunch</b>							
Free meals	1	76.00	--	--	--	100.0	--
No free/reduced-price meals	35	70.77	2.9	5.7	14.3	28.6	48.6
<b>IEP</b>							
No	36	70.92	2.8	5.6	13.9	30.6	47.2
<b>Migrant</b>							
No	36	70.92	2.8	5.6	13.9	30.6	47.2
<b>Courses taken</b>							
4111 (Alg 1)	10	75.40	10.0	20.0	20.0	20.0	30.0
3142 (Math for the Techs 2)	26	69.19	--	--	11.5	34.6	53.8
<b>Gifted/talented</b>							
No	36	70.92	2.8	5.6	13.9	30.6	47.2
<b>504 plan</b>							
No	36	70.92	2.8	5.6	13.9	30.6	47.2
<b>Alternative school</b>							
Yes	4	70.25	--	--	25.0	50.0	25.0
No	32	71.00	3.1	6.3	12.5	28.1	50.0
<b>Accommodations</b>							
Yes	1	53.00	--	--	--	--	100.0
No	35	71.43	2.9	5.7	14.3	31.4	45.7

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

**Table 5.3**  
**English 1 Operational Test, Regular Schools:**  
**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>	56,326	75.51	10.2	15.0	23.7	19.5	31.6
<b>Gender</b>							
Female	27,434	76.65	11.2	16.0	25.1	19.7	28.0
Male	28,440	74.49	9.4	14.1	22.5	19.3	34.8
Unknown	452	70.38	3.1	9.1	19.9	20.8	47.1
<b>Grade</b>							
7	3	94.33	66.7	33.3	--	--	--
8	8,500	86.08	27.5	30.8	28.6	9.5	3.6
9	46,901	73.79	7.3	12.3	23.1	21.3	36.0
10	695	65.15	1.6	4.3	12.9	16.3	64.9
11	121	65.18	2.5	5.8	9.9	19.0	62.8
12	37	67.05	2.7	10.8	16.2	8.1	62.2
Other	69	67.38	1.4	8.7	11.6	14.5	63.8
<b>Ethnicity</b>							
White	30,019	79.72	15.8	20.6	27.1	17.5	19.0
African-American	21,266	70.01	2.8	7.5	19.5	22.2	48.0
Hispanic	2,444	71.53	5.7	11.1	20.3	20.1	42.8
Asian/Pacific Islander	709	80.81	22.1	20.0	23.8	15.2	18.8
American Indian	104	73.82	3.8	12.5	27.9	23.1	32.7
Other	980	77.33	11.9	16.8	25.5	20.4	25.3
Unknown	804	69.09	2.7	7.2	16.7	20.5	52.9
<b>Language</b>							
Parent waiver	67	72.18	6.0	14.9	19.4	17.9	41.8
Pre-functional	295	54.62	--	--	0.7	3.7	95.6
Beginner	256	59.43	--	0.4	3.9	8.6	87.1
Intermediate	438	67.23	0.2	2.7	11.2	26.9	58.9
Advanced	654	77.27	6.1	16.7	31.0	25.8	20.3
Initially English Proficient	111	81.96	16.2	27.9	23.4	20.7	11.7
Title III First Year Exited	9	87.00	44.4	22.2	11.1	--	22.2
Title III Second + Year Exited	133	77.69	12.0	17.3	27.1	21.8	21.8
English Speaker I	168	82.78	24.4	22.0	28.0	11.9	13.7
English Speaker II	52,486	75.94	10.6	15.4	24.2	19.5	30.2
Other	1,709	68.60	3.2	7.1	16.3	19.4	54.0
<b>Lunch</b>							
Free meals	22,987	70.31	3.2	8.3	19.4	21.8	47.3
Reduced-price meals	4,240	74.67	6.1	13.1	26.5	23.0	31.3
No free/reduced-price meals	29,099	79.73	16.4	20.5	26.7	17.1	19.2
<b>IEP</b>							
Yes	5,462	64.54	1.0	2.9	9.9	17.7	68.5
No	50,864	76.69	11.2	16.3	25.2	19.7	27.6

**Table 5.3**  
**English 1 Operational Test, Regular Schools:**

<b>Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics</b>							
<b>Migrant</b>							
Yes	16	67.19	--	12.5	12.5	18.8	56.3
No	56,310	75.51	10.2	15.0	23.7	19.5	31.6
<b>Courses taken</b>							
3011 (Eng 1)	56,122	75.52	10.2	15.0	23.7	19.5	31.6
Other	204	73.12	9.3	10.8	26.0	16.2	37.7
<b>Gifted/talented</b>							
Academic	8,625	88.17	35.1	33.3	23.6	6.2	1.8
Artistic	614	79.08	12.1	21.0	29.3	18.4	19.2
Both	636	90.06	42.3	33.3	20.4	3.6	0.3
No	46,451	72.91	5.2	11.2	23.7	22.2	37.7
<b>504 plan</b>							
Yes	660	74.88	9.4	13.2	23.8	20.9	32.7
No	55,666	75.52	10.2	15.0	23.7	19.5	31.6
<b>Alternative school</b>							
Yes	1,109	64.19	1.0	3.2	10.8	16.8	68.3
No	55,217	75.73	10.4	15.2	24.0	19.5	30.8
<b>Accommodations</b>							
Yes	2,383	63.60	0.6	3.0	7.7	16.3	72.5
No	53,943	76.03	10.7	15.5	24.4	19.6	29.8

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

**Table 5.4**  
**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>	7	62.14	--	--	--	14.3	85.7
<b>Gender</b>							
Female	1	62.00	--	--	--	--	100.0
Male	6	62.17	--	--	--	16.7	83.3
<b>Ethnicity</b>							
African-American	1	58.00	--	--	--	--	100.0
Unknown	6	62.83	--	--	--	16.7	83.3
<b>Language</b>							
Other	7	62.14	--	--	--	14.3	85.7
<b>Lunch</b>							
No free/reduced-price meals	7	62.14	--	--	--	14.3	85.7
<b>IEP</b>							
No	7	62.14	--	--	--	14.3	85.7
<b>Migrant</b>							
No	7	62.14	--	--	--	14.3	85.7
<b>Courses taken</b>							
3011 (Eng 1)	7	62.14	--	--	--	14.3	85.7
<b>Gifted/talented</b>							
No	7	62.14	--	--	--	14.3	85.7
<b>504 plan</b>							
No	7	62.14	--	--	--	14.3	85.7
<b>Alternative school</b>							
No	7	62.14	--	--	--	14.3	85.7
<b>Accommodations</b>							
No	7	62.14	--	--	--	14.3	85.7

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

**Table 5.5**  
**Physical Science Operational Test, Regular Schools:**  
**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>	53,969	72.46	10.5	10.1	16.6	18.3	44.5
<b>Gender</b>							
Female	26,710	72.24	9.0	9.9	17.2	19.4	44.6
Male	27,043	72.73	12.1	10.4	16.2	17.1	44.2
Unknown	216	66.00	4.6	6.0	8.8	15.3	65.3
<b>Grade</b>							
6	2	87.50	--	100.0	--	--	--
8	519	80.54	13.9	21.4	29.9	21.0	13.9
9	35,077	74.02	12.6	11.4	17.9	18.0	40.0
10	16,150	69.52	6.5	7.3	14.2	18.9	53.1
11	1,662	67.93	6.1	7.0	12.2	16.5	58.3
12	499	66.37	3.6	4.4	10.6	20.4	60.9
Other	60	59.73	3.3	--	5.0	5.0	86.7
<b>Ethnicity</b>							
White	28,716	77.02	16.4	14.1	19.9	19.0	30.6
African-American	20,928	66.27	2.5	4.5	12.4	17.5	63.1
Hispanic	2,206	69.82	6.3	8.4	15.0	17.9	52.4
Asian/Pacific Islander	675	81.70	27.9	16.0	20.7	13.2	22.2
American Indian	71	74.34	11.3	11.3	15.5	25.4	36.6
Other	919	73.87	11.0	13.5	16.6	18.2	40.7
Unknown	454	65.38	5.1	5.9	7.3	12.6	69.2
<b>Language</b>							
Parent waiver	70	73.11	12.9	11.4	14.3	15.7	45.7
Pre-functional	215	58.23	1.4	0.5	1.9	7.0	89.3
Beginner	227	61.24	1.8	0.9	4.8	9.7	82.8
Intermediate	382	65.79	1.8	4.5	8.9	20.4	64.4
Advanced	545	74.41	9.7	10.6	19.3	22.6	37.8
Initially English Proficient	112	78.33	17.9	12.5	27.7	15.2	26.8
Title III First Year Exited	7	89.14	42.9	14.3	14.3	28.6	--
Title III Second + Year Exited	149	73.13	11.4	10.7	14.1	18.1	45.6
English Speaker I	173	80.46	22.0	19.7	17.3	16.2	24.9
English Speaker II	50,790	72.77	10.8	10.3	17.0	18.4	43.5

**Table 5.5**  
**Physical Science Operational Test, Regular Schools:**

<b>Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics</b>							
<b>Language</b>							
Other	1,299	63.98	3.9	6.1	7.5	12.2	70.4
<b>Lunch</b>							
Free meals	21,492	66.73	2.8	5.1	12.3	17.8	61.9
Reduced-price meals	4,026	71.01	6.4	8.5	17.3	20.5	47.3
No free/reduced-price meals	28,451	77.00	16.9	14.1	19.8	18.3	31.0
<b>IEP</b>							
Yes	5,714	60.97	1.3	2.3	6.4	10.1	79.9
No	48,255	73.82	11.6	11.0	17.8	19.2	40.3
<b>Migrant</b>							
Yes	9	65.00	--	--	22.2	11.1	66.7
No	53,960	72.46	10.5	10.1	16.6	18.3	44.5
<b>Courses taken</b>							
3211 (Physical Science)	53,353	72.38	10.4	10.0	16.6	18.3	44.7
3231 (Chemistry)	6	89.67	33.3	50.0	--	16.7	--
3241 (Physics)	232	89.17	41.4	24.6	25.4	5.6	3.0
Other	378	73.35	11.1	17.7	15.6	17.5	38.1
<b>Gifted/talented</b>							
Academic	7,296	87.26	38.0	23.1	21.4	11.0	6.5
Artistic	497	74.10	6.4	14.1	23.9	21.3	34.2
Both	270	86.47	33.7	23.3	23.0	13.7	6.3
No	45,906	70.01	6.1	7.9	15.8	19.4	50.9
<b>504 plan</b>							
Yes	632	72.75	10.8	10.3	15.7	19.5	43.8
No	53,337	72.46	10.5	10.1	16.7	18.2	44.5
<b>Alternative school</b>							
Yes	949	60.47	0.6	1.2	4.3	9.6	84.3
No	53,020	72.68	10.7	10.3	16.9	18.4	43.8
<b>Accommodations</b>							
Yes	2,870	59.46	1.0	1.5	4.3	9.0	84.3
No	51,099	73.19	11.1	10.6	17.3	18.8	42.3

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

**Table 5.6**  
**Physical Science 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>	15	60.60	--	--	6.7	13.3	80.0
<b>Gender</b>							
Female	7	62.86	--	--	14.3	28.6	57.1
Male	8	58.63	--	--	--	--	100.0
<b>Ethnicity</b>							
White	4	69.25	--	--	25.0	25.0	50.0
African-American	6	56.33	--	--	--	--	100.0
Hispanic	2	65.50	--	--	--	50.0	50.0
Unknown	3	54.33	--	--	--	--	100.0
<b>Language</b>							
Other	15	60.60	--	--	6.7	13.3	80.0
<b>Lunch</b>							
No free/reduced-price meals	15	60.60	--	--	6.7	13.3	80.0
<b>IEP</b>							
No	15	60.60	--	--	6.7	13.3	80.0
<b>Migrant</b>							
No	15	60.60	--	--	6.7	13.3	80.0
<b>Courses taken</b>							
3211 (Physical Science)	15	60.60	--	--	6.7	13.3	80.0
<b>Gifted/talented</b>							
Academic	1	50.00	--	--	--	--	100.0
No	14	61.36	--	--	7.1	14.3	78.6
<b>504 plan</b>							
No	15	60.60	--	--	6.7	13.3	80.0
<b>Alternative school</b>							
No	15	60.60	--	--	6.7	13.3	80.0
<b>Accommodations</b>							
No	15	60.60	--	--	6.7	13.3	80.0

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

**Table 5.7**  
**US History and Constitution Operational Test, Regular Schools:**  
**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>	47,604	69.36	2.0	5.1	14.6	20.8	57.6
<b>Gender</b>							
Female	24,585	68.41	1.4	3.8	12.7	19.7	62.4
Male	22,877	70.40	2.6	6.5	16.7	21.9	52.4
Unknown	142	66.37	--	3.5	4.2	20.4	71.8
<b>Grade</b>							
8	1	58.00	--	--	--	--	100.0
9	637	63.25	0.5	1.6	5.7	10.4	81.9
10	5,983	65.89	0.7	2.2	8.7	15.2	73.1
11	37,892	70.11	2.2	5.6	15.8	22.1	54.2
12	3,045	68.14	1.7	4.3	12.4	17.6	64.0
Other	46	63.09	--	--	6.5	8.7	84.8
<b>Ethnicity</b>							
White	26,196	72.24	3.1	7.6	20.2	24.7	44.4
African-American	17,887	65.08	0.3	1.3	6.2	14.9	77.4
Hispanic	1,741	68.04	1.1	2.9	12.8	20.5	62.7
Asian/Pacific Islander	645	74.07	6.4	9.9	22.8	22.0	38.9
American Indian	82	67.80	1.2	2.4	6.1	31.7	58.5
Other	662	70.40	2.0	5.3	18.3	23.0	51.5
Unknown	391	69.08	1.5	5.9	13.8	21.0	57.8
<b>Language</b>							
Parent waiver	96	67.43	--	1.0	11.5	20.8	66.7
Pre-functional	100	60.00	--	--	3.0	6.0	91.0
Beginner	152	61.36	--	--	1.3	5.9	92.8
Intermediate	238	63.51	--	0.4	2.1	12.6	84.9
Advanced	326	67.99	0.6	0.6	12.3	24.2	62.3
Initially English Proficient	80	71.81	1.3	8.8	23.8	20.0	46.3
Title III First Year Exited	21	77.05	4.8	19.0	23.8	28.6	23.8
Title III Second + Year Exited	124	70.31	5.6	3.2	13.7	20.2	57.3
English Speaker I	226	72.65	1.3	8.4	24.8	25.7	39.8
English Speaker II	45,211	69.41	2.0	5.1	14.6	20.9	57.4
Other	1,030	69.93	3.8	6.6	16.8	16.0	56.8
<b>Lunch</b>							
Free meals	16,549	65.38	0.2	1.5	6.9	15.5	75.8
Reduced-price meals	3,264	67.83	0.6	2.8	10.7	21.8	64.1
No free/reduced-price meals	27,791	71.90	3.2	7.4	19.6	23.8	46.0

**Table 5.7**  
**US History and Constitution Operational Test, Regular Schools:**

<b>Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics</b>							
<b>IEP</b>							
Yes	3,520	63.69	0.3	1.0	4.9	11.2	82.6
No	44,084	69.81	2.1	5.4	15.4	21.5	55.6
<b>Migrant</b>							
Yes	8	61.00	--	--	--	25.0	75.0
No	47,596	69.36	2.0	5.1	14.6	20.8	57.6
<b>Courses taken</b>							
3320 (US Hst of Const. or College Prep US Hst)	43,207	68.14	0.7	3.3	12.8	21.1	62.1
3372 (AP US Hst)	3,597	82.87	16.9	24.4	33.7	16.8	8.1
336D (IB Hst of Americas)	87	80.75	10.3	18.4	36.8	26.4	8.0
Other	713	73.35	5.0	9.8	21.6	21.3	42.2
<b>Gifted/talented</b>							
Academic	4,380	76.93	5.7	13.3	31.3	26.3	23.4
Artistic	581	72.95	4.5	10.7	19.3	23.2	42.3
Both	166	78.14	7.8	16.3	28.3	30.7	16.9
No	42,477	68.49	1.5	4.1	12.7	20.1	61.5
<b>504 plan</b>							
Yes	554	71.13	3.2	6.7	19.5	21.5	49.1
No	47,050	69.34	2.0	5.0	14.5	20.8	57.7
<b>Alternative school</b>							
Yes	521	62.51	--	0.2	3.8	10.0	86.0
No	47,083	69.43	2.0	5.1	14.7	20.9	57.3
<b>Accommodations</b>							
Yes	1,556	62.44	0.1	0.4	3.3	8.2	88.0
No	46,048	69.59	2.0	5.2	15.0	21.2	56.6

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

**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>	63	63.79	1.6	--	3.2	14.3	81.0
<b>Gender</b>							
Female	30	61.60	--	--	--	10.0	90.0
Male	33	65.79	3.0	--	6.1	18.2	72.7
<b>Ethnicity</b>							
White	31	66.23	3.2	--	6.5	22.6	67.7
African-American	22	61.23	--	--	--	4.5	95.5
Hispanic	3	66.00	--	--	--	33.3	66.7
Other	1	58.00	--	--	--	--	100.0
Unknown	6	60.50	--	--	--	--	100.0
<b>Language</b>							
English Speaker II	11	64.36	--	--	--	27.3	72.7
Other	52	63.67	1.9	--	3.8	11.5	82.7
<b>Lunch</b>							
Free meals	3	59.67	--	--	--	--	100.0
No free/reduced-price meals	60	64.00	1.7	--	3.3	15.0	80.0
<b>IEP</b>							
Yes	1	50.00	--	--	--	--	100.0
No	62	64.02	1.6	--	3.2	14.5	80.6
<b>Migrant</b>							
No	63	63.79	1.6	--	3.2	14.3	81.0
<b>Courses taken</b>							
3320 (US Hst of Const. or College Prep US Hst)	62	63.92	1.6	--	3.2	14.5	80.6
Other	1	56.00	--	--	--	--	100.0
<b>Gifted/talented</b>							
Academic	6	61.50	--	--	--	--	100.0
No	57	64.04	1.8	--	3.5	15.8	78.9
<b>504 plan</b>							
No	63	63.79	1.6	--	3.2	14.3	81.0
<b>Alternative school</b>							
No	63	63.79	1.6	--	3.2	14.3	81.0
<b>Accommodations</b>							
No	63	63.79	1.6	--	3.2	14.3	81.0

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

## 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**  
**2008-09 EOCEP Test Administration Summary Statistics: Regular Schools and Adult Education Programs, Overall and by Gender, Race, and Accommodations**

Algebra 1/Math Tech 2							
Regular Schools				Adult Education Programs			
	N	Scale Score			N	Scale Score	
		Mean	SD			Mean	SD
<b>Overall</b>	59,214	79.07	11.78	<b>Overall</b>	36	70.92	9.30
<b>Gender</b>				<b>Gender</b>			
Female	29,147	79.46	11.45	Female	15	68.87	7.59
Male	29,704	78.77	12.08	Male	21	72.38	10.28
<b>Ethnicity</b>				<b>Ethnicity</b>			
African-American	22,272	74.32	10.42	African-American	15	67.13	5.07
White	31,953	82.45	11.50	White	12	75.50	10.56
<b>Accommodations</b>				<b>Accommodations</b>			
No	56,922	79.48	11.69	No	35	71.43	8.91
Yes	2,292	68.79	9.10	Yes	1	53.00	--

  

English 1							
Regular Schools				Adult Education Programs			
	N	Scale Score			N	Scale Score	
		Mean	SD			Mean	SD
<b>Overall</b>	56,326	75.51	12.68	<b>Overall</b>	7	62.14	4.22
<b>Gender</b>				<b>Gender</b>			
Female	27,434	76.65	12.19	Female	1	62.00	--
Male	28,440	74.49	13.05	Male	6	62.17	4.62
<b>Ethnicity</b>				<b>Ethnicity</b>			
African-American	21,266	70.01	11.46	African-American	1	58.00	--
White	30,019	79.72	11.82	White	--	--	--
<b>Accommodations</b>				<b>Accommodations</b>			
No	53,943	76.03	12.52	No	7	62.14	4.22
Yes	2,383	63.60	10.40	Yes	--	--	--

**TABLE 6**  
**2008-09 EOCEP Test Administration Summary Statistics: Regular Schools and Adult Education Programs, Overall and by Gender, Race, and Accommodations**

<b>Physical Science</b>							
<b>Regular Schools</b>				<b>Adult Education Programs</b>			
	<b>Scale Score</b>				<b>Scale Score</b>		
	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	
<b>Overall</b>	53,969	72.46	14.01	<b>Overall</b>	15	60.60	9.08
<b>Gender</b>				<b>Gender</b>			
Female	26,710	72.24	13.33	Female	7	62.86	11.92
Male	27,043	72.73	14.65	Male	8	58.63	5.78
<b>Ethnicity</b>				<b>Ethnicity</b>			
African-American	20,928	66.27	11.68	African-American	6	56.33	7.17
White	28,716	77.02	13.79	White	4	69.25	8.22
<b>Accommodations</b>				<b>Accommodations</b>			
No	51,099	73.19	13.83	No	15	60.60	9.08
Yes	2,870	59.46	10.53	Yes	--	--	--

  

<b>US History and Constitution</b>							
<b>Regular Schools</b>				<b>Adult Education Programs</b>			
	<b>Scale Score</b>				<b>Scale Score</b>		
	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	
<b>Overall</b>	47,604	69.36	9.47	<b>Overall</b>	63	63.79	8.00
<b>Gender</b>				<b>Gender</b>			
Female	24,585	68.41	8.93	Female	30	61.60	5.95
Male	22,877	70.40	9.92	Male	33	65.79	9.13
<b>Ethnicity</b>				<b>Ethnicity</b>			
African-American	17,887	65.08	7.51	African-American	22	61.23	5.78
White	26,196	72.24	9.55	White	31	66.23	9.42
<b>Accommodations</b>				<b>Accommodations</b>			
No	46,048	69.59	9.46	No	63	63.79	8.00
Yes	1,556	62.44	6.81	Yes	--	--	--

**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**

Administration	Number of Items	Number of Test Takers	KR-20	KR-21	Classical SEM*
<b>Algebra 1/Mathematics for the Technologies 2</b>					
Fall 2008	50	9,293	0.833	0.802	4.256
Spring 2009	50	49,490	0.883	0.865	4.042
Summer 2009	50	415	0.825	0.797	4.125
<b>English 1</b>					
Fall 2008	55	8,097	0.879	0.864	3.956
Spring 2009	55	47,932	0.902	0.891	4.012
Summer 2009	55	277	0.877	0.861	3.967
<b>Physical Science</b>					
Fall 2008	55	13,797	0.900	0.888	4.740
Spring 2009	55	40,099	0.880	0.868	4.734
Summer 2009	55	57	0.863	0.843	4.691
<b>US History and Constitution</b>					
Fall 2008	55	13,444	0.839	0.828	3.462
Spring 2009	55	34,077	0.870	0.862	3.511
Summer 2009	55	62	0.823	0.807	3.399

\*Classical SEM calculated using the KR-20 reliability coefficient.

**Note:** Includes all students who attempted the test using a 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**  
**2008–09 EOCEP Conditional Standard Errors of Measurement**

Administration	Raw Scores	Scale Scores
<b>Algebra/ Mathematics for the Technologies 2</b>		
Fall 2008	3.25	4.21
Spring 2009	3.30	4.14
Summer 2009	3.24	4.14
<b>English 1</b>		
Fall 2008	3.46	3.76
Spring 2009	3.50	3.76
Summer 2009	3.44	3.76
<b>Physical Science</b>		
Fall 2008	3.53	4.74
Spring 2009	3.57	4.71
Summer 2009	3.50	4.76
<b>US History and Constitution</b>		
Fall 2008	3.62	3.35
Spring 2009	3.63	3.35
Summer 2009	3.58	3.39

**Note:** Includes all students who attempted the test using a 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**

**2008–09 EOCEP Consistency Index for Passing Scores**

<b>Administration</b>	<b>Consistency Index</b>
<b>Algebra/ Mathematics for the Technologies 2</b>	
Fall 2008	81.83
Spring 2009	88.64
Summer 2009	81.98
<b>English 1</b>	
Fall 2008	84.43
Spring 2009	87.45
Summer 2009	83.55
<b>Physical Science</b>	
Fall 2008	85.42
Spring 2009	84.22
Summer 2009	83.49
<b>US History and Constitution</b>	
Fall 2008	82.37
Spring 2009	83.56
Summer 2009	82.18

## 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**

<b>Content Domain*</b>	<b>Fall</b>	<b>Spring</b>	<b>Summer</b>
EA-1	8	8	4
EA-2	6	9	8
EA-3	9	8	5
EA-4	11	10	9
EA-5	10	11	20
EA-6	5	4	4
NA	1	0	0
<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 English 1**

<b>Content Domain*</b>	<b>Fall</b>	<b>Spring</b>	<b>Summer</b>
E1-1	21	18	20
E1-2	6	9	8
E1-3	5	7	6
E1-4	11	10	9
E1-6	12	11	12
<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 8.3**  
**Item Distribution by Content Domain for Physical Science**

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

\*PS-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.

PS-2: The student will demonstrate an understanding of the structure and properties of atoms.

PS-3: The student will demonstrate an understanding of various properties and classifications of matter.

PS-4: The student will demonstrate an understanding of chemical reactions and the classifications, structures, and properties of chemical compounds.

PS-5: The student will demonstrate an understanding of the nature of forces and motion.

PS-6: The student will demonstrate an understanding of the nature, conservation, and transformation of energy.

PS-7: The student will demonstrate an understanding of the nature and properties of mechanical and electromagnetic waves.

**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	2	2	2
USHC-2	8	8	8
USHC-3	4	4	4
USHC-4	5	5	5
USHC-5	7	7	7
USHC-6	5	5	5
USHC-7	8	8	8
USHC-8	5	5	5
USHC-9	9	9	9
USCH-10	2	2	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 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- but 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 Col 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 curriculum standards and measurement guidelines. Various committees reviewed all items; only items approved by these committees and the SCDE were included in the 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	Eng	PS	USHC	Alg	Eng	PS	USHC
Fall 2008	A+	20	19	26	18	28	28	33	25
	A-	29	33	24	37	21	25	21	30
	B+	0	0	0	0	0	1	0	0
	B-	0	3	4	0	1	0	1	0
	C+	0	0	0	0	0	1	0	0
	C-	1	0	1	0	0	0	0	0
Spring 2009	A+	21	17	18	19	31	29	29	25
	A-	26	32	32	35	18	24	21	27
	B+	0	2	1	1	0	1	1	2
	B-	1	3	4	0	1	1	4	1
	C+	0	0	0	0	0	0	0	0
	C-	2	1	0	0	0	0	0	0
Summer 2009	A+	14	17	9	8	27	24	17	12
	A-	20	15	9	11	19	14	13	11
	B+	4	4	4	2	3	6	4	7
	B-	6	8	6	2	0	5	5	4
	C+	2	3	6	13	0	2	5	9
	C-	4	8	20	18	1	4	9	12

**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**

<b>Domain</b>	<b>EA-1</b>	<b>EA-2</b>	<b>EA-3</b>	<b>EA-4</b>	<b>EA-5</b>	<b>EA-6</b>	<b>NA</b>	<b>Number of Items</b>
<b>Fall 2008 (N = 9,293)</b>								
<b>EA-1</b>	1	0.386	0.387	0.436	0.457	0.268	0.096	8
<b>EA-2</b>	—	1	0.436	0.533	0.493	0.315	0.108	6
<b>EA-3</b>	—	—	1	0.512	0.502	0.293	0.093	9
<b>EA-4</b>	—	—	—	1	0.591	0.346	0.117	11
<b>EA-5</b>	—	—	—	—	1	0.319	0.126	10
<b>EA-6</b>	—	—	—	—	—	1	0.086	5
<b>NA</b>	—	—	—	—	—	—	1	1
<b>Spring 2009 (N = 49,490)</b>								
<b>EA-1</b>	1	0.509	0.423	0.565	0.589	0.272	—	8
<b>EA-2</b>	—	1	0.454	0.626	0.619	0.319	—	9
<b>EA-3</b>	—	—	1	0.516	0.522	0.259	—	8
<b>EA-4</b>	—	—	—	1	0.686	0.328	—	10
<b>EA-5</b>	—	—	—	—	1	0.352	—	11
<b>EA-6</b>	—	—	—	—	—	1	—	4
<b>Summer 2009 (N = 415)</b>								
<b>EA-1</b>	1	0.296	0.188	0.329	0.382	0.139	—	4
<b>EA-2</b>	—	1	0.332	0.527	0.485	0.235	—	8
<b>EA-3</b>	—	—	1	0.400	0.500	0.181	—	5
<b>EA-4</b>	—	—	—	1	0.605	0.307	—	9
<b>EA-5</b>	—	—	—	—	1	0.298	—	20
<b>EA-6</b>	—	—	—	—	—	1	—	4

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

**Table 8.7**  
**Correlations among Domain Scores for English 1**

Domain	E1-1	E1-2	E1-3	E1-4	E1-6	Number of Items
<b>Fall 2008 (N = 8,097)</b>						
<b>E1-1</b>	1	0.530	0.579	0.641	0.634	21
<b>E1-2</b>	—	1	0.445	0.462	0.455	6
<b>E1-3</b>	—	—	1	0.504	0.496	5
<b>E1-4</b>	—	—	—	1	0.552	11
<b>E1-6</b>	—	—	—	—	1	12
<b>Spring 2009 (N = 47,932)</b>						
<b>E1-1</b>	1	0.669	0.648	0.637	0.680	18
<b>E1-2</b>	—	1	0.631	0.578	0.633	9
<b>E1-3</b>	—	—	1	0.562	0.618	7
<b>E1-4</b>	—	—	—	1	0.621	10
<b>E1-6</b>	—	—	—	—	1	11
<b>Summer 2009 (N = 277)</b>						
<b>E1-1</b>	1	0.658	0.556	0.560	0.548	20
<b>E1-2</b>	—	1	0.518	0.507	0.507	8
<b>E1-3</b>	—	—	1	0.494	0.468	6
<b>E1-4</b>	—	—	—	1	0.472	9
<b>E1-6</b>	—	—	—	—	1	12

**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 Physical Science**

<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>B-7</b>	<b>Number of Items</b>
<b>Fall 2008 (N = 13,797)</b>								
<b>B-1</b>	1	0.496	0.577	0.569	0.562	0.541	0.510	8
<b>B-2</b>	—	1	0.540	0.548	0.494	0.499	0.488	8
<b>B-3</b>	—	—	1	0.596	0.582	0.575	0.528	8
<b>B-4</b>	—	—	—	1	0.564	0.566	0.540	8
<b>B-5</b>	—	—	—	—	1	0.561	0.505	8
<b>B-6</b>	—	—	—	—	—	1	0.509	8
<b>B-7</b>	—	—	—	—	—	—	1	7
<b>Spring 2009 (N = 40,099)</b>								
<b>B-1</b>	1	0.444	0.425	0.482	0.459	0.474	0.418	8
<b>B-2</b>	—	1	0.441	0.542	0.512	0.508	0.490	7
<b>B-3</b>	—	—	1	0.463	0.453	0.448	0.403	8
<b>B-4</b>	—	—	—	1	0.556	0.573	0.529	9
<b>B-5</b>	—	—	—	—	1	0.545	0.524	8
<b>B-6</b>	—	—	—	—	—	1	0.515	8
<b>B-7</b>	—	—	—	—	—	—	1	7
<b>Summer 2009 (N = 57)</b>								
<b>B-1</b>	1	0.404	0.589	0.214	0.345	0.589	0.452	8
<b>B-2</b>	—	1	0.469	0.277	0.422	0.280	0.599	8
<b>B-3</b>	—	—	1	0.266	0.445	0.506	0.577	8
<b>B-4</b>	—	—	—	1	0.295	0.386	0.333	8
<b>B-5</b>	—	—	—	—	1	0.328	0.459	8
<b>B-6</b>	—	—	—	—	—	1	0.526	8
<b>B-7</b>	—	—	—	—	—	—	1	7

**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 2008 (N = 13,444)</b>											
USHC-1	1	0.188	0.157	0.135	0.150	0.153	0.170	0.139	0.166	0.106	2
USHC-2	—	1	0.427	0.300	0.358	0.388	0.415	0.391	0.413	0.293	8
USHC-3	—	—	1	0.298	0.355	0.379	0.403	0.387	0.441	0.257	4
USHC-4	—	—	—	1	0.259	0.268	0.309	0.271	0.311	0.183	5
USHC-5	—	—	—	—	1	0.341	0.374	0.330	0.370	0.222	7
USHC-6	—	—	—	—	—	1	0.389	0.347	0.407	0.236	5
USHC-7	—	—	—	—	—	—	1	0.387	0.463	0.248	8
USHC-8	—	—	—	—	—	—	—	1	0.414	0.266	5
USHC-9	—	—	—	—	—	—	—	—	1	0.258	9
USHC-10	—	—	—	—	—	—	—	—	—	1	2
<b>Spring 2009 (N = 34,077)</b>											
USHC-1	1	0.357	0.291	0.269	0.328	0.273	0.343	0.290	0.331	0.195	2
USHC-2	—	1	0.421	0.409	0.473	0.412	0.511	0.434	0.495	0.270	8
USHC-3	—	—	1	0.340	0.405	0.334	0.414	0.345	0.384	0.213	4
USHC-4	—	—	—	1	0.391	0.335	0.402	0.329	0.401	0.225	5
USHC-5	—	—	—	—	1	0.392	0.486	0.419	0.474	0.264	7
USHC-6	—	—	—	—	—	1	0.411	0.356	0.400	0.220	5
USHC-7	—	—	—	—	—	—	1	0.458	0.516	0.277	8
USHC-8	—	—	—	—	—	—	—	1	0.438	0.231	5
USHC-9	—	—	—	—	—	—	—	—	1	0.272	9
USHC-10	—	—	—	—	—	—	—	—	—	1	2
<b>Summer 2009 (N = 62)</b>											
USHC-1	1	0.078	0.262	0.222	0.019	0.227	0.162	0.154	0.263	0.294	2
USHC-2	—	1	0.329	-0.060	0.184	0.407	0.240	0.392	0.435	0.242	8
USHC-3	—	—	1	0.297	0.219	0.336	0.409	0.425	0.499	0.270	4
USHC-4	—	—	—	1	0.096	0.055	0.276	0.189	0.222	0.315	5
USHC-5	—	—	—	—	1	0.260	0.132	0.345	0.313	0.124	7
USHC-6	—	—	—	—	—	1	0.381	0.374	0.588	0.302	5
USHC-7	—	—	—	—	—	—	1	0.344	0.474	0.361	8
USHC-8	—	—	—	—	—	—	—	1	0.527	0.281	5
USHC-9	—	—	—	—	—	—	—	—	1	0.324	9
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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