CASAS – Comprehensive Adult Student Assessment System

Technical Manual

Reading Assessments

Employability Competency System (ECS)
Including
Workforce Learning Systems (WLS)

January 2010

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(a) Format of the Technical Manual

This manual provides the technical information related to reading assessments developed by the CASAS – Comprehensive Adult Student Assessment Systems. These assessments include the Employability Competency System (ECS) and the Workforce Learning System (WLS). For simplicity, all forms covered in this manual will generally be referred to as the ECS Reading Assessments.

The *General Information* section describes the purpose of the aforementioned assessments and lists all test forms that are covered in this manual.

The *Development* section describes the process used to create the ECS Reading Assessment and assign items to test forms. The psychometric properties are analyzed for all items in the item bank and for the complete test forms.

The *Maintenance* section includes information about publishing dates for the ECS Reading Assessments, steps taken to ensure score comparability across test forms, steps taken to maintain the security of the assessment, and a history of the assessments use.

The *Content Validity* section includes information on the match of the content to the NRS Educational Functioning Levels, the competencies measured by the ECS Reading Assessments, and the subject matter experts involved in the determination of content.

The *Standard-Setting Procedures* section describes the procedures used to establish cut scores for each NRS Educational Functioning Level and the standard error of measurement for each cut score.

The *Reliability* section includes information on the correlation of scores across alternate or parallel test forms, classification consistency into NRS Educational Functioning Levels (EFL) when using parallel test forms, and a description of the research designs used to test the reliability of the ECS Reading Assessments.

The *Construct Validity* section includes information on the comparability of the ECS Reading Assessments with other assessments designed to assess educational gain, the extent to which performance on the reading assessments is related to other related measures of the intended construct, and analyses regarding practice effects.

The *Other Information* section includes information on the determination of test administration time, appropriate modifications, and recommendations for retesting.

(b) General Information

Item b1 – A statement, in the technical manual for the test, of the intended purpose of the test and how the test will allow examinees to demonstrate the skills that are associated with the NRS educational functioning levels

The intended purpose of the *Employability Competency System (ECS) Reading Assessments*, which include forms from the *Workforce Learning System (WLS) Reading Assessments*, is to measure the NRS educational functioning levels of members of the youth and adult education population in the content domain of reading.

This series includes two (or more) secure and parallel equated forms at each of four difficulty levels. Agencies are able to use four distinct test levels to place and subsequently to measure educational gains for learners as related to all NRS educational functioning levels of ABE/ASE and ESL.

These assessments are appropriate for use with learners with beginning to advanced level reading skills (in ABE/ASE programs from ABE beginning literacy to adult secondary education, and in ESL programs from ESL beginning literacy to advanced ESL). The direct relationship between the NRS educational functioning levels for both ESL and ABE/ASE programs to the CASAS scale score ranges is covered under Item f3.

The *ECS Reading Assessments* can be administered as traditional paper-and-pencil tests or as computer-based assessments.

The basic skills content standards as measured on the *ECS Reading Assessments* relate directly to curriculum content, which in turn allows test results to inform instruction and program improvement. *ECS Reading Assessments* are one of the key components in an integrated system that links curriculum, instruction, and assessment. CASAS develops assessments based on specifications that include learner goals, basic skills content standards and life skill competencies, range of test difficulty level, and curriculum. The *ECS Reading Assessment* test items are written in functional life skills contexts that include applied reading in a variety of employment preparation and workplace situations.

Item b2 – A summary of the precise editions, forms, levels, and, if applicable, subtests and abbreviated tests that the test publisher is requesting that the Secretary review and determine for suitable use in the NRS

Table b2-1 lists the fourteen ECS and WLS Reading test forms being submitted for approval. In addition to these 14 forms, there are several forms that are not used for the NRS reporting but are used as appraisal/locater instruments. The CASAS test level (A-D), number of items, test use, and computer-based testing (CBT) availability is listed for each form. For a comparison of CASAS test levels to NRS educational functioning levels, please refer to Tables f3-1 through f3-3.

Table b2-1 ECS and WLS Reading Test Forms

Form	CASAS Test Level	No. Items	Test Use	CBT Availability
11R	A	25	progress (pre/post testing)	Yes
12R	A	25	progress (pre/post testing)	Yes
13R	B	34	progress (pre/post testing)	Yes
14R	B	34	progress (pre/post testing)	Yes
114R	B	34	progress (pre/post testing)	Yes
213R	B	34	progress (pre/post testing)	Yes
214R	B	34	progress (pre/post testing)	Yes
15R	C	38	progress (pre/post testing)	Yes
16R	C	38	progress (pre/post testing)	Yes
116R	C	38	progress (pre/post testing)	Yes
215R	C	36	progress (pre/post testing)	Yes
216R	C	36	progress (pre/post testing)	Yes
17R	D	30	progress (pre/post testing)	Yes
18R	D	30	progress (pre/post testing)	Yes

(c) Development

The CASAS assessment system comprises a range of assessment instruments that serve a variety of purposes. The major test series are used in adult education classes and training programs to measure student learning gains in reading comprehension, listening comprehension, math, writing, and speaking. The reading, listening, and math series consist of multiple-choice test items that can be administered as pre- and post-tests across a range of student ability levels in a life and work skills context.

The first CASAS test forms were created in 1981. New tests have been created over the ensuing years to expand or strengthen the CASAS assessment system. As test items are developed, they are placed in an item pool. New multiple-choice test forms and modes for delivery are constructed from this calibrated item bank.

Table c-1 provides a historical summary of the progressive development of the item bank. The chart shows the number of test forms, the number of items field tested, and the number of field-test items that were eliminated due to poor statistical or operational performance. The information on the ECS Reading items were developed in several phases.

Table c-1 Historical Summary of CASAS Item Pool

Year	Total item field-test forms	Total field-test items	Field-test items dropped	Total items in bank	Purpose of items
1980-85	112	3,050	671	2,379	Initial development of reading, math and listening item bank
1987-88	32	832	113	3,098	Mostly additional employment-oriented items in reading and math
1989-91	49	1,064	194	3,968	High-school level items in subject-area reading and in math; additional math items
1992	10	200	14	4,154	Additional reading and math items
1993	3	72	1	4,225	Items for beginning literacy tests
1995	8	196	33	4,388	Items for D-level ECS reading and math forms
1998	5	105	8	4,485	Additional employability items for new ECS reading forms
2000-03	20	512	33	4,964	New Life and Work Reading series; Reading for Citizenship series; WLS Reading and Math
2004-05	-	-	-	2,732	Internal review retires a large number of reading and math items
2005-07	25	452	39	3,145	New Life and Work listening test series
2008	2	48	2	3,191	Items for additional Life and Work reading forms

Establish Test Design

The purpose and parameters of a CASAS test development project are set collaboratively with the National Consortium or the state or agency requesting the test and CASAS staff. The main considerations in designing a new CASAS assessment include:

I. Purpose of test
   a. Appraisals, progress tests and certification tests will differ in length, scale score range, content coverage, etc.
II. Content Focus
   a. General focus: life skills, general employability, workplace, or other.
   b. Specific: the basic skill content standards and competencies that relate to NRS Education Functioning Levels.
III. Modality, item types, and breadth and depth of coverage to be included
   a. For reading tests, there are a number of item types that assess different reading skills.
IV. Level and range of difficulty
   a. Difficulty of item content, the complexity of the items, and the cognitive level of the skills to be assessed.
V. Test length
   a. A natural constraint on the range of skills and competencies that can be assessed.
VI. Need for Parallel Forms
   a. Appropriate items are needed to create two forms that are parallel in content coverage and range of difficulty.

Determine Item Development Needs

CASAS items are developed in response to a request for an approved test development project or to expand an existing item pool to meet future test construction needs. When item development is targeted to a specific assessment development project, a needs assessment is conducted to identify the priority content and skill areas to be measured for each assessment. For assessment development intended for adult education programs, adult education professionals are surveyed to identify and prioritize relevant content domains, usually expressed in the form of life skill competencies and basic skill content standards. Surveys are prepared and distributed or electronically disseminated to adult education agencies across the country. The results from these surveys provide guidance to item and test development.

In addition to identifying target content domains, an initial step in planning item development is identifying the number of items that need to be created. Items undergo an extensive review and pilot testing process and item attrition will occur at several stages of the process. About three times the number of items needed for the final calibrated test form are generated during the item development process. For example, if two 32-item test forms at an intermediate adult proficiency level are needed, 200 initial draft items are written to ensure a minimum of 80 calibrated items are available for selecting the final test forms and items. This provides flexibility to have enough calibrated items that are aligned with the test specifications for both content coverage and range of difficulty on a test form.

Qualified Item Writers

CASAS engages item writers in addition to the CASAS item and test development staff to contribute to item writing projects. Item writers are selected on the basis of:

- experience in adult education (teaching, curriculum development), with adult ESL and ABE populations for which the tests are intended
- familiarity with the language and cultural issues and life experience of ESL and ABE populations; and with the real-life language and literacy needs of adults in society
- successful experience in writing test items, assessment materials and curriculum
- academic background that relates to their language or literacy teaching expertise
- demonstrated ability to write to specific test blueprint specifications and standards
- having completed fairness and sensitivity training

Potential writers receive a day-long training by a master item writer that includes theory and practice in test development. The training covers the CASAS item writing/editing guidelines, (see "*Criteria applied in the editing process*" below) the CASAS competencies and basic skills content standards, as well as practical exercises in writing items to specific targeted competencies and standards. Item writers who are selected are mentored by master writers, who give specific feedback on their work in order to build skills. The progression of draft items illustrates the development of test items from initial draft to final form for pilot testing. Item writers occasionally come together for group writing and review sessions with qualified editors where additional guidelines or advice on content and on item development issues are discussed.

Item writers are given detailed test blueprint specifications, including specific competencies, basic skills or content standards, at a specific targeted instructional level. Copies of all source material are submitted with draft items to CASAS. Item writers follow established procedures, including confidentiality and non-disclosure policies, in preparing, organizing and submitting their draft item materials.

Item Development and Editing

Draft items are submitted to the CASAS Item and Test Development Department to review and edit. Three to four test development professional staff review and edit each draft item. This is essential, as different perspectives and interpretations can be brought to the material. If an initial draft item requires major revision or a change in focus or complexity, it is returned to the original writer with specific feedback to be revised. Other revisions are made by the CASAS test development team. The team also does some initial item development.

The lead editor is responsible for compiling the multiple edits and discussing them with the editing team as a whole to reach a consensus on the final revisions, and a final pilot test version of the items is compiled. Further refinements to items continue to be made through the entire development process, from this "final" draft, to clinical tryout to pilot to field-test stage.

Criteria applied in the editing process include the following questions:

- Were the initial item criteria met (e.g., level, Content Standards, competency)?

- Are all parts of the content as free as possible of potential biases (e.g., age, race, gender, ethnic background, specialized knowledge)?
- Could any part of the content be considered tricky?
- Is the display easily accessible (i.e., it is something that could be encountered in daily life)?
- Is there any cultural bias? (Please refer to Item c2i for a description of the *CASAS Fairness and Sensitivity Review Process.)*
- Does the group of items intended for a pilot or field-test form have diverse ethnic and gender representation (e.g., names, roles)?
- Does the item test what it is intended to test?
- Is the stem of the test question and distracters clear and direct?
- Is the stem phrased in the positive form?
- Can the item be answered solely from the information given? (i.e., Is it a knowledge question? Is information from another item needed to answer the question?)
- Is there only one best answer?
- Are all options plausible?
- Are all options homogeneous in content and length?
- Are options containing numbers presented consecutively when possible?
- Is grammar and punctuation correct?

Conduct Clinical Tryout

During the item drafting process, a small-scale clinical tryout of certain items may be conducted, especially if there are uncertainties as to level of difficulty or relevance of topic, or if a new assessment strategy approach is being tried. Items will be placed on an informal test form and administered in several adult education classes by CASAS development staff to gain more insight on how examinees respond to the item. Classes that are representative in terms of the learner population for whom the final tests are intended are chosen for this exercise. On the basis of the results of the clinical tryout, a shift in direction or leveling in item development may be made.

Conduct Pilot Testing

When the editing process has resulted in an acceptable number of final-draft items, the items are sent to the production staff for formatting in preparation for the next step of pilot testing. This stage is important especially in discovering flaws in items and noting general reactions to the test items from teachers and students. In the pilot test, draft items are assembled into item test forms and administered to a total of approximately 100 students in classes at two or three schools that are representative of the target population for the final test forms in terms of ability level, gender, age, and ethnic group. The pilot tests are administered by teachers who have training and experience in administering CASAS tests. The teachers are provided a feedback form to record teacher and student comments on the test items.

An item analysis is computed from the pilot test and the results are reviewed by the CASAS test development, editing and psychometric staff. Teacher and student feedback is also reviewed. The evaluation criteria for the pilot test follow the same general criteria as analysis of the field tests discussed below. The CASAS editing team identifies and corrects any item flaws suggested by the statistical item and option analysis including, for example, incorrect options being interpretable as correct; lack of clarity in the wording of questions, options, or prompts; and distractors that are not attractive to examinees. Items that have content that is not seen as appropriate to certain demographic groups are either revised or dropped. The draft items that have no problems – and those with flaws that have been edited, revised or modified – are then ready for formal field testing. It is vital that any problems with the items be resolved before items are placed on item field tests, after which further revision cannot be made without additional field testing.

Conduct Item Field Test

The best-performing items from the pilot test are selected to be placed on item field-test forms. Selection is made on the basis of the item analysis statistics from the pilot tests, anecdotal information from teacher feedback, and appropriate coverage of the competencies and basic skills identified as priorities for the final test forms to be constructed. Consideration is also given to achieving variety and balance in difficulty, content and display type (e.g., narrative text, chart, graphic) as well as in gender and ethnic representation. The items placed on the field test forms need to meet all the content domain and psychometric requirements identified in the initial project planning and test blueprint specifications, since the majority of calibrated items for the final operational test forms will come from this set of items. The remainder may come from calibrated items already in the item bank that meet the test blueprint specifications.

To allow for linking of results from each of the field test forms to the standard CASAS measurement scale, 8 to 10 linking items from the item pool are included on each of the item field-test forms. The difficulties of the linking items should range from an expected p-value of .40 to about .70; they should have point biserial correlations of at least .30; show good high and low group discrimination of .30 or above; and have content compatible with the draft test items being field tested. A representative set of linking items is selected to measure examinees at different positions within the ability continuum.

Administration of the field tests to the appropriate population is vital to the success of the process. To ensure a total minimum *N* of at least 300, approximately 500 to 600 copies of each form are sent out. Agencies are selected based on diversity of size, population served, in urban and non-urban areas in a range of states. Classes at an instructional level corresponding to the test level are selected. The final sample size includes some students above the targeted instructional level and below the test level. Instruction in participating classes needs to be related to the domain being tested. The field tests are administered by teachers or other staff who are trained to administer CASAS tests. Test administrators receive detailed instructions on how to administer the test, collect student information, and provide for test security before, during, and after testing.

In addition to program and class level, information collected on students includes gender, age, ethnic background, native language, and number of years of education. Test administrators complete structured feedback forms to record teacher and learner comments and observations on specific test items, on the test overall, and on the testing process. The number of participants for the ECS Reading field tests (agencies and examinees) and the examinees' demographic information is included in Tables c1i-1 through c1i-4.

As completed answer sheets are returned to CASAS, numbers are tallied to ensure that the overall *N* will be achieved and that the diversity of level and population is being obtained; if these are not the case, more field tests are sent out to representative populations.

Analyze Results of Field Test

When a sufficient number of field-test forms have been received, the answer sheets are scanned and statistical analyses are completed. Statistics for each item include classical item analysis showing for each response option: the p-value, biserial, point biserial, discrimination index, and breakdown by high and low-performing examinees; overall test form performance statistics; breakdown of *N* by agency and level; and student demographics. Based on the analyses of these data, additional analyses and reviews are conducted by item writers and SMEs as necessary.

The main statistical criteria considered in determining item viability can be summarized as follows:

- point biserial (minimum 0.30 acceptable)
- p-value (ideally between 0.30 and 0.80)
- high and low group discrimination index (higher than 0.20 is desirable)
- option choice by high and low-performing examinees
- percent on option choices, including non-response
- overall mean percentage test score (between 0.40 and 0.70)
- infit-outfit statistics (between 0.7 and 1.3)
- estimated IRT discrimination
- lower asymptote (examined if greater than 0.10)
- item bias data (please refer to Item c2i detailing CASAS Fairness and Sensitivity Process)

The comments and reactions collected from test administrators and students are compiled and carefully reviewed to identify possible bias, formatting issues, or other problems with items.

Items that show poor performance on the basis of statistics or other factors are flagged for review. Items whose topic or content was considered by teachers and students to be objectionable, inappropriate, questionable, of little relevance, etc., are deleted. In other cases, items can be returned to the editing stage and reworked for possible additional field testing.

Table c-2 provides a summary of field test items that were dropped from CASAS assessment series.

Table c-2 CASAS Field Tests – Summary of Removed Items

Test Series	Number of Final Test Forms Created	Number of Items Removed During Field-Test Process
Life and Work/Life Skills/Citizenship/Secondary Level Assessments	22	47 items from 24 item field-tests forms
ECS/WLS Reading	**14**	**265 items from 117 item field-tests forms**
ECS/LS Listening	10	541 items from 87 item field-tests forms
LS Math/Secondary Level Assessments	10	260 items from 88 item field-tests forms
ECS/WLS Math	12	74 items from 106 item field-tests forms
Life and Work Listening	6	39 items from 25 field-test forms

CASAS Item Bank

CASAS policy is to have a selection of reserve items across difficulty levels and content areas for each test series so that there is a continuous pipeline of items available. This reserve of items is available should specific items become compromised. Refer to item d3 for more information on the CASAS test security policy. These reserve items are also available if CASAS determines, through the continual analysis of psychometric properties, that items do not maintain the characteristics of reliability, validity, fairness, and sensitivity to demographic groups.

In order to keep this pipeline of items, CASAS field-tests a 40 to 50 percent surplus of items above the number of items originally needed for placement on the fixed item forms for a given series. Based on an analysis of the psychometric properties of field-test items, the items are grouped into three categories:

- Items that meet CASAS qualifications and are marked for inclusion on current test forms
- Items the meet CASAS qualifications and are included in the item bank as reserve items
- Items that do not meet CASAS qualifications and are marked for archiving and possible future revision

When an entire test form or series is to be retired and replaced, the replenishment of the item bank requires the field-testing of large quantities of items to provide sufficient new items for the construction of the new test forms. The ECS Reading tests are delivered via PPT and CBT, and CASAS uses an intact forms model to construct the test forms. This means that items were selected from the CASAS reading item bank for construction of six intact test forms which were individually packaged in the test file. Significant item field testing was required to develop items for this series, as described in this technical manual.

The CASAS reading item bank for the ECS Reading series is organized to be a comprehensive source of information for the item and test developers. The database consists of easy-to-reference and up-to-date information on each item. Table c-3 describes the information elements contained in the item bank for the CASAS ECS Reading series.

Table c-3 Attributes of CASAS ECS Reading Item Bank

General Item Information	Item identification number Item field-test form number and location Item intact form and location Administration type Item text Correct answer
Item Statistics/Psychometric Properties	Field-test item information Historical item information Current p-value Rasch Unit (RIT difficulty index) Point bi-serial Index of Bias Fairness and sensitivity review comments Demographics and Sample Size Dataset used for analyses
Item Details	Item type Item referenced to CASAS Content Item referenced to CASAS Competencies Standards Word count Item type Word count of listening passage Gender reference Item enemies or clones Key words Item status version
Item Development History	Year written Item writer

Calibrate New Items and Add to the Item Pool

Poor-performing or problematic items are dropped, and the remaining items are then calibrated and then linked to the common CASAS measurement scale using the Rasch one-parameter IRT model (if an anchor item performed poorly on the field test form, it is not used in the calibration process.). These newly calibrated items are then placed into the calibrated item pool. They are listed in the item database along with their statistical data, competency codes, and content standard codes. This process is further detailed under Item D of this document.

Construct Test Forms from the Item Pool

To construct a planned test form, the CASAS test development team selects items from the item pool to create a test that meets the design criteria (*Determine test development needs*). Factors considered include:

- item difficulty, by Rasch Unit (RIT)
- topical content
- skill content, in terms of the competencies and basic skills the item assesses
- item type – there are a number of reading item types that address different reading skills.
- Item task and format – refers to how the information is presented and what the examinee needs to do to process it. Item task and format often relate to the skills an item addresses. A variety of item tasks and formats are represented on a test form to cover a broad range of reading skills. Items are initially placed on the test form by difficulty: easier items first, followed by increasingly more difficult items. Adjustments are made to achieve variety and flow in topical and skill content, item task and format.

In selecting items for the test, achieving the desired coverage of skills is one consideration. Another is the scoring scale of the test: to fit into a test series of pre- and post-tests, a fairly specific scale score range is required. Items of different RITs may need to be substituted into the original selection to achieve the desired scale score range. Additionally, the proposed number of items on the test form may be increased or decreased in achieving the desired scale score range.

Parallel test forms are constructed simultaneously to achieve similarity in content and scale score range.

The final forms are reviewed by the CASAS directors who check the coverage of competencies and basic skills, the scoring scale, the overall balance and flow, and the quality of the items themselves. When approved, the tests are assigned form numbers.

The performance of new test forms is monitored on a continual basis after implementation with various types of statistical analysis to ensure the tests are performing as intended, that the items are stable and not biased with subsequent adult populations being assessed. Many of these analyses are performed on an annual basis and include:

- classical item analyses
- fairness and sensitivity review including Differential Item Functioning (DIF) analyses and fairness and sensitivity item review panels
- reliability estimates
- validity studies

Item c1 – The nature of samples of examinees administered the test during pilot or field testing, such as—

(c1i) The number of examinees administered each item

Table c1i-1 includes the total number of examinees that were tested on items that comprise the final assessment forms. Tables c1i-2 through c1i-4 present demographic information on these examinees by NRS Educational Functioning Level. The percentage breakouts are reported on

those examinees that provided demographic information. Also provided is the total number of examinees that did not provide demographic information.

Table c1i-1 ECS Reading Field Test Information – Total Population

Final ECS Forms	NRS Educational Functioning Levels	N
11 and 12	ABE - Beginning ABE Literacy ESL - Beginning ESL Literacy, Low Beginning ESL, High Beginning ESL Literacy ESL - Beginning ESL Literacy, Low Beginning ESL, High Beginning ESL	4,694
13 and 14	ABE - Beginning Basic Education, Low Intermediate Basic Education ESL - Low Intermediate ESL, High Intermediate ESL	5,443
114R	ABE - Beginning Basic Education, Low Intermediate Basic Education ESL - Low Intermediate ESL, High Intermediate ESL	1,281
213 and 214	ABE - Beginning Basic Education, Low Intermediate Basic Education ESL - Low Intermediate ESL, High Intermediate ESL	513
15 and 16	ABE - High Intermediate Basic Education ESL- Low Advanced ESL	3,866
116	ABE - High Intermediate Basic Education ESL- Low Advanced ESL	786
215 and 216	ABE - High Intermediate Basic Education ESL- Low Advanced ESL	452
17 and 18	ABE - Low Adult Secondary Education ABE - High Adult Secondary Education	1,395

Table c1i-2 ECS Reading Field Test Demographic Information – Gender

NRS Educational Functioning Level	Male (%)	Female (%)	No Info (%)
ABE - Beginning ABE Literacy			
ESL - Beginning ESL Literacy, Low Beginning ESL, High Beginning ESL	38.6	61.4	
ABE - Beginning Basic Education, Low Intermediate Basic Education			
ESL - Low Intermediate ESL, High Intermediate ESL	48.4	48.4	3.2
ABE - High Intermediate Basic Education			
ESL - Low Advanced ESL	45.9	51.3	2.8
ABE - Low Adult Secondary Education			
ABE - High Adult Secondary Education	44.2	52.9	2.9

Table c1i-3 ECS Reading Field Test Demographic Information – Years of Education

NRS Educational Functioning Level	6 or Less (%)	7 to 13 (%)	Greater than 13 (%)	No Info (%)
ABE - Beginning ABE Literacy				
ESL - Beginning ESL Literacy, Low Beginning ESL, High Beginning ESL	39.1	56.5	4.4	0.0
ABE - Beginning Basic Education, Low Intermediate Basic Education				
ESL - Low Intermediate ESL, High Intermediate ESL	17.8	63.9	14.8	3.5
ABE - High Intermediate Basic Education				
ESL- Low Advanced ESL	11.6	70.7	14.2	3.5
ABE - Low Adult Secondary Education				
ESL - High Adult Secondary Education	7.4	67.7	16.8	8.1

Table c1i-4 ECS Reading Field Test Demographic Information – Ethnicity/Race

NRS Educational Functioning Level	White (%)	Hispanic (%)	Black (%)	Asian (%)	Other (%)	No info (%)
ABE - Beginning ABE Literacy ESL - Beginning ESL Literacy, Low Beginning ESL, High Beginning ESL	8.8	68.9	4.1	16.5	1.7	0.0
ABE - Beginning Basic Education, Low Intermediate Basic Education ESL - Low Intermediate ESL, High Intermediate ESL	11.2	60.0	12.2	10.2	4.6	1.8
ABE - High Intermediate Basic Education ESL Low Advanced ESL	14.0	61.1	11.5	6.1	6.0	1.3
ABE - Low Adult Secondary Education, ESL - High Adult Secondary Education	17.7	41.6	8.7	15.5	12.3	4.2

(c1ii) How similar the sample or samples of examinees used to develop and evaluate the test were to the adult education population of interest to the NRS

Prior to the item field-testing and calibration process, all items were pilot-tested with both Adult Basic Education (ABE/ASE) and English as a Second Language (ESL) learners. The items are then field-tested with both ABE/ASE and ESL learners. The demographic characteristics of the sample are analyzed during the process to ensure that they are as representative as possible of the adult population of interest to the NRS. For comparison purposes, Tables c1ii-1 and c1ii-2 show the demographics of the adult educational population at the national and regional level during the 2005-06 program year.

Table c1ii-1 NRS Adult Education Population – Gender Information

Gender	Male		Female	
	N	%	N	%
United States	1,134,114	46.2	1,321,651	53.8
Eastern Region	152,404	41.9	211,319	58.1
Midwestern Region	177,037	47.0	199,456	53.0
Southern Region	416,017	46.4	479,919	53.6
Western Region	365,440	47.0	412,596	53.0

Table c1ii-2 NRS Adult Education Population – Ethnicity Information

Ethnicity	White		Hispanic		Asian		Black or African American	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
United States	663,799	27.0	1,072,641	43.7	190,830	7.8	472,854	19.3
Eastern Region	99,050	27.2	139,094	38.2	32,641	9.0	90,242	24.8
Midwestern Region	149,652	39.7	108,702	28.9	27,583	7.3	83,893	22.3
Southern Region	294,703	32.9	302,495	33.8	28,038	3.1	255,780	28.5
Western Region	120,297	15.5	483,858	62.2	102,305	13.1	42,509	5.5

(c1iii) The steps taken to ensure that the examinees were motivated while responding to the test

During the administration of field tests, CASAS provides detailed instructions to test administrators. Item two from the Field-test Administration Directions specifically states:

> *Explain to learners that we are developing a new reading test. Today we are going to find out how well the test works and if the questions are right for your level.*

Prior to administration of the test forms, administrators emphasize to the examinees the importance of doing their best on the test and answering the questions to the best of their ability, but not to guess at answers just to finish the test. Examinees are told the significant role they are playing in the creation of a new test.

In addition, to help ensure that the test results are from examinees who were motivated while responding to the test, the actual calibration of items followed the recommendations of Wright (1968) and the experience of the Northwest Evaluation Association (Ingebo & Forster, 1980) to include for item calibration purposes only those item response sets for examinees who had responded correctly to more than 20 percent and fewer than 90 percent of the items on the test. The exclusion of responses for this lower success range minimized the influence of including results for those who may have been guessing. Also the lower asymptote is analyzed to further investigate if item guessing may be a concern. Items with a lower asymptote value greater than .10 are subject to further review. In addition, items with a high percentage of non-responses are reviewed by the item development staff and psychometricians. One additional restriction eliminates the inclusion of results for those who do not have at least one correct answer on the last half of the test. Lastly, all field-test administrators are asked to complete an evaluation of the field-test process. Their comments are analyzed to identify any potential issues including examinee motivation.

Item c2 – The steps taken to ensure the quality of test items or tasks

(c2i) The extent to which items or tasks on the test were reviewed for fairness and sensitivity

Bias and sensitivity reviews of all CASAS items are conducted to ensure that the performance of an examinee is based on construct-relevant factors and not construct-irrelevant factors or group classification characteristics such as gender, race, ethnicity, native language, or disability. The CASAS policy for bias and sensitivity review of all items and forms follows the guidelines outlined in the *ETS Fairness Review Guidelines* (Educational Testing Service, 2003). Also the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 1999) and *Educational Measurement* (Brennan, 2006) were used in developing CASAS policy.

CASAS has adopted this document as an outline for our policy for bias and sensitivity review. It also details specific guidelines to be used in CASAS bias and sensitivity reviews as recommended by CASAS psychometricans.

The majority of CASAS tests assess basic skills in an adult functional context. These tests are designed to assess a general skill, such as reading comprehension, writing, mathematical reasoning, listening comprehension, speaking, or problem solving that can be applied across competency areas such as consumer economics or employability.

General Guidelines for CASAS Fairness and Sensitivity Reviews (From ETS Fairness Review Guidelines)

1. **Equality of Treatment –** An important aspect of fairness is treating people with impartiality regardless of such characteristics as gender, race, ethnicity, or disability that are not relevant to the test.
2. **Familiarity with ETS Guidelines** – Fairness is addressed during the design and development phases of test creation. Content or images that would otherwise violate the guidelines are included in a test only if required for validity. All item writers review and are familiar with all guidelines for fairness prior to writing items and developing tests.
3. **External Contributions Outside CASAS –** There are contributions to tests from external people who represent relevant perspectives and diverse adult education groups. Representatives of various groups are included in test development committees to determine the knowledge, skills, and abilities to be tested.
4. **Preliminary Reviews** – Materials receive a preliminary fairness review before any substantive test publication work is done. This helps to recognize changes recommended by review panels at an early date and makes these changes less expensive and difficult to incorporate.
5. **Differential Item Functioning (DIF) –** The DIF procedure that CASAS has chosen to use is based on the work of Holland and Thayer (1988). The Mantel-Haenszel statistic compares the performance on an item for a "focal" group to that of a "reference" group matched in overall ability or proficiency. This matching controls for differences in abilities of these different groups. Example focal groups could be "females" or "Hispanic" and example reference groups could be "males" or "Caucasian," respectively. In other words, the Mantel-Haenszel DIF statistic is calculated to evaluate whether there is any statistical difference in item performance for groups of "females" and "males" that are matched for ability or proficiency. The DIF analyses are run on all CASAS items with the focal groups representing classifications of gender, ethnicity, and spoken language groups for which there is a large enough *N*. A statistically significant difference does not

automatically indicate than an item is biased. Rather, from these analyses, items are flagged for additional review. For CASAS, these subsequent reviews occur for any item with an absolute DIF value (Mantel-Haenzel statistic) greater than 1.5. CASAS chose this value based on ETS guidelines (Doran and Holland, 1993).

6. **Validation –** The strategies by which we collect evidence of fairness is called validation. Essentially, validation is the systematic collection of a body of evidence to evaluate intended interpretations and uses of test scores. Sources of evidence include test content, response processes, internal test structure, and relationships to other relevant variables. CASAS groups these aspects of validity evidence in two general clusters:
    a. Content validity – the examination of the test content to determine whether it covers a representative sample of what the test is intended to measure
    b. Construct validity – the examination of the test to ensure that it only measures the construct of interest.
7. **Score interpretation and use** – The appropriate interpretation and use of each CASAS test score is made available to test administrators, test users and score recipients.

Timeline for Fairness and Sensitivity Reviews

Consistent with best practice, items are reviewed for fairness and sensitivity throughout the item development process.

- Item writers review the items for fairness and sensitivity at the time of item development.
- Educators submit comments regarding fairness and sensitivity when they return completed field tests.
- The demographic characteristics of the field test examinees are reviewed to ensure that they are representative of the target population (i.e. the population that will be taking the test). If the demographic representation is not deemed adequate additional field tests are administered.
- DIF analysis is conducted on items based on field test results and ongoing psychometric analyses. A significant DIF statistic indicates that an item may be measuring something other than the construct of interest, but it is not proof of bias. Therefore, items that yield significant DIF statistics are not immediately deleted; instead, they are flagged for further in-depth review by SMEs and fairness and sensitivity panel members.
- A fairness and sensitivity panel is convened to review all items just prior to the time items are allocated to alternative test forms and prior to publishing. (Note: special attention is given to items with DIF statistics greater than 1.5
- Continuous test improvement and evaluation includes running DIF analyses and convening fairness and sensitivity panels. CASAS follows ETS and NRS Submission Guidelines by reviewing test items for fairness and sensitivity at least once every five years. (Note: special attention is given to items with DIF statistics greater than 1.5)

Guidelines for Fairness and Sensitivity – Item Writers and Educators

- All CASAS item writers receive Fairness and Sensitivity Training. This training consists of the review of example items and an in-depth review of six fairness review guidelines published by ETS and the standards outlined in chapter seven of *Standards for*

Educational and Psychological Testing. In additional, items writers observe and participate on all Fairness and Sensitivity Review Panels conducted by CASAS.

- All new field-tested items are reviewed by educators in the field. Their comments are documented and reviewed by the CASAS team of item writers. The qualifications and experience of these educators is documented.

Guidelines for Selection of Fairness Review Panel Members

- Fairness and Sensitivity review panels are convened to:
    - Review items that are considered for inclusion on final test forms
    - Conduct periodic reviews of items on published CASAS tests
    - Conduct periodic reviews of items that have been flagged with DIF statistics greater than 1.5
- The fairness reviewers must have been trained in fairness review or have had the original training updated within the last five years. CASAS has developed a sensitivity and fairness training program that each panel member attends. This training lasts approximately two hours with a one hour of discussion with a CASAS trainer of the guidelines that each panel member should use in their review and one hour of self-study in which the panel members review and study the guidelines on an individual basis. This is in addition to other fairness and sensitivity training they have received. Demographic characteristics of the reviewers are considered as detailed below.
- The fairness reviewers have no stake in the test or other material being reviewed.
- The fairness reviewers are demographically diverse (age, ethnicity, gender).
    - The ethnicity of the panel members represents the populations being served.
    - The panel consists of a minimum of three members from each major ethnic group.
    - The gender of the panel members is diverse and not weighted too much to one gender
    - Different age groups are represented by the panel members

Guidelines for Fairness and Sensitivity Reviewers

The guidelines are intended to help ensure that only construct relevant factors affect examinees' scores. (Something that is construct-relevant is part of the knowledge, skills, abilities, or other characteristics a test is supposed to measure.) Test items that cause group differences because of construct-irrelevant factors do not meet standards for fairness and sensitivity.

The groups of primary concern for the Guidelines for Fairness and Sensitivity Reviewers, as outlined by ETS are defined by:

- Age
- Disability
- Ethnicity
- Gender
- National Origin
- Race

- Religion
- Sexual Orientation

The ETS Fairness Review Guidelines represent one consideration when evaluating validity evidence. Therefore, material required for construct-relevant measurement for a given intended use may be necessary even if it includes topics, ideas, attitudes, images, or other content that the guidelines would otherwise discourage. For example, a detailed description of the effects of a severe injury may be required to appropriately measure emergency medical personnel on a licensure test. However, such a description would likely not generalize to measuring reading ability in the average adult population because it would contain construct irrelevant factors that are unrelated to the intended use of the scores.

All CASAS fairness and sensitivity reviewers are given a brief background on the procedures followed to test for fairness and sensitivity during the design and development phases of the creation of the test.

Following are the six specific guidelines outlined by ETS. Below each guideline are examples of areas that each CASAS fairness reviewer considers when judging whether the specific guideline has been met. Below each guideline are examples of characteristics the items should have. Each CASAS fairness reviewer has access to the document *ETS Fairness Review Guidelines (2003)* to reference additional information about each guideline.

ETS Guideline 1. Treat people with respect in all test materials.

- Language and images show respect for all groups, unless required for validity (for example a history test might require material that normally would be out of compliance).
- Items emphasize that people in different groups function in a variety of societal roles.
- Items do not treat problems or beliefs of specific groups as humorous or inconsequential.
- Items do not state or imply that one group is superior to another or promote a certain opinion, value, or preference.
- Items do not assume that all examinees are citizens of the United States and have the same cultural background.
- Items avoid inappropriate underlying assumptions. For example, “The doctors and their wives attended the event.” (implies all doctors are men)

ETS Guideline 2. Minimize the effects of construct-irrelevant knowledge or skills.

- As per ETS, the following can cause problems with construct relevance and are included only if clearly construct relevant
    - Items avoid the use of charts, maps, graphs and the like if they are randomly chosen among many possible means of testing a point. In other words, if the examinee’s ability to correctly use the chart, map, or graph may create a new construct that the item is not meant to measure.
    - Items avoid unnecessarily difficult words, figures of speech, idioms or synthetic structures. Also avoid:
        - Words or topics mainly associated with wealthier social class
        - Specialized legal, political words, scientific, and transportation words (affidavit, filibuster, vacuole)

        - Regionalisms
    - Items do not require that the examinee needs specific knowledge about a religion to respond to an item.
    - Items do not place the primary focus on military topics
    - Items avoid that an examinee requires specific knowledge of culture in the United States (unless, as in previous guidelines, the item is designed to test such knowledge such as in a citizenship examination.

ETS Guideline 3. Avoid material that is unnecessarily controversial, inflammatory, offensive, or upsetting

- Items including unnecessarily inflammatory or upsetting material. Reasonably controversial material may be necessary for valid measurement even in skill tests. When controversial material is necessary for an item, use neutral language to discuss the issue.
- Items avoid, if possible, certain extremely controversial topics such as certain political issues, abortion, or abuse of people.
- Items treat certain topics with extreme care such as shocking accidents, illness, or natural disasters, death or dying, evolution, religion, slavery, suicide, violence, and suffering.
- Items use sensitivity regarding images that may be offensive to people from other countries.
- Items avoid using the test to promote a particular cause.

ETS Guideline 4. Use appropriate terminology to refer to people.

- Items do not attach unnecessary labels to people. If a person's membership in a group is not relevant to the item, do not mention this. If it is relevant, be certain to use the proper terminology to refer to the person/group. See the *ETS Fairness Review Guidelines* for a summary of the appropriate terminology for a wide variety of groups of persons.

ETS Guideline 5. Avoid stereotypes.

- As stated in the *ETS Fairness Review Guidelines,* a stereotype is defined as "a conventional, over-generalized, and oversimplified conception of the characteristics of a group of people. Stereotypes attribute characteristics to a group on the basis of age, disability, ethnicity, gender, national origin, race, religion, or sexual orientation. Stereotypes ignore differences among members of the group."

ETS Guideline 6. Represent diversity in depictions of people.

- Gender balance
- Racial and ethnic balance
- As mentioned under ETS Guideline #1, items emphasize that people in different groups function in a variety of societal roles. Depictions show diversity and balance.

Methodology of the CASAS Fairness and Sensitivity Reviews

- The CASAS fairness review is done with respect to the most recent version of the *ETS Fairness Review Guidelines*. The guidelines (see above) are reviewed with the fairness

and sensitivity panel prior to beginning the review. The following documents are made available to all reviewers for reference:
    - *ETS Fairness Review Guidelines (2003)*
    - *ETS Standards for Quality and Fairness (2002)*
- The CASAS fairness reviewer has access to the test specifications and is aware of the characteristics of the test-taking population and the purpose of the test. The reviewers have access to all components of the test that an examinee would have, such as audiotapes (or scripts) and visual materials, in addition to the items. They are able to view items as the examinee would (same item placement).
- Fairness reviewers are provided a survey form to record their review results and recommendations. This survey form is designed so that reviewers can effectively record their review of each item and facilitates the aggregation of the results from each fairness and sensitivity reviewer. The survey form ensures that the panel member is responding to each of the guidelines listed above.
- Fairness reviewers first review the items individually noting any fairness and sensitivity issues with respect to the *ETS Fairness Review Guidelines*. The specific guideline that is violated is cited in each instance. Other comments or suggested actions recommended by the reviewers that are not violations of the Fairness Review Guidelines are noted and discussed but distinguished from violations of the Fairness Review Guidelines.
- To avoid reviewer fatigue, review panels are normally not assigned more than 175 review items. The panel process is usually completed within 2-3 weeks.
- After the individual review, all fairness reviewers meet to discuss the items that were identified as having any fairness or sensitivity issues. From these final group discussions, panel reviewers arrive at consensus regarding recommendations and issues with the reviewed items. Members from the CASAS item writing team and psychometrics team are present at this discussion.
- To protect the integrity of the results and the CASAS assessments, all testing related materials used by reviewers are returned and accounted for by CASAS. In addition, all panel members must sign a confidentiality agreement.
- Based on the results from the review panel, CASAS may decide to replace problematic items with new items covering the same content standards and of comparable difficulty.

Reporting Results from the CASAS Fairness Review Panel

- The methodology followed by the panel to conduct the review is summarized and documented by the leader of the study.
- All information on the panel members' demographic characteristics and qualifications (including any previous fairness and sensitivity training) is collected, aggregated as necessary, and summarized for reporting purposes.
- All conclusions from the panel are summarized and aggregated for presentation in CASAS technical manuals.
- Any changes to test forms or items based on the panel's recommendations are documented.

ECS Reading Fairness and Sensitivity Review

As part of CASAS policy to continuously validate items and forms to ensure that they remain fair and sensitive to the intended testing population, in fall 2008 a panel of key gender, ethnic, racial, ESL literacy and language specialists, to specifically analyze items from each test form with Mantel Haenzel Delta statistics greater than 1.5. A total 29 items were reviewed from the ECS Reading test series. The selection of panel members, review methodology, and reporting of results all followed the process previously outlined in this section. The panel consisted of 14 members. The demographic characteristics and background of the panel are presented in Tables c2i-1 to c2i-4.

Table c2i-1 Fairness and Sensitivity Panel - Gender

Gender	N	%
Female	7	50.0
Male	7	50.0
Total	14	100.0

Table c2i-2 Fairness and Sensitivity Panel - Age

Age	N	%
< 35	3	21.4
35-45	6	42.9
46-59	3	21.4
60+	2	14.3
Total	14	100.0

Table c21-3 Fairness and Sensitivity Panel – Race or Ethnicity

Race or Ethnicity	N	%
Hispanic or Latino	4	28.6
White (Non Hispanic or Latino)	2	14.3
Asian	5	35.7
Black or African American	3	21.4
Total	14	100.0

Table c2i-4 Fairness and Sensitivity Panel – Panel Members and Background

Panelist #1	Professor – PhD in Education
Panelist #2	Retired Adult Education Administrator/Coordinator – BS Education, MS Educational Management
Panelist #3	Dean, San Francisco Community College – MA Bilingual Education
Panelist #4	Intake/Assessment Specialist – MA in TESOL
Panelist #5	Senior Forecast Analyst - MS in Social and Applied Economics, MBA in International Business
Panelist #6	Adult Education Coordinator, PhD
Panelist #7	Instructor
Panelist #8	Teacher – BA California Teaching Credential, MA Education
Panelist #9	Lecturer – California Community College Teaching Lifetime Credential – BA Communications
Panelist #10	Education Policy Analyst – ED.M. Education Policy and Management, B.A. Psychology
Panelist #11	Teacher/PDC Manager (CALPRO), MA
Panelist #12	Coordinator San Diego Office of Education – BA English Home Economics Masters in Education-Education Tech, Life Secondary Teaching Credential
Panelist #13	Director of Academic Development – M.A. TESOL
Panelist #14	Coordinator – BA Social Science, Masters in Education – Ed. Leadership, ESOL Certified

To illustrate the review process and criteria, a sample of a review form is presented in Table c2i-5. Overall, the review panel reported very few comments regarding potential violations of the six fairness guidelines (see *Guidelines for Fairness and Sensitivity Reviewers)* and there was consensus to keep all items. As per CASAS guidelines, members from the CASAS item writing team and psychometrics team were present at the final panel discussion. Detailed notes were recorded of the panel's comments. When the tests were originally constructed, only those items that qualified for inclusion in the CASAS item bank were used in constructing the final test forms.

Based on the comments and recommendations of the panel review no additional items were selected for removal from the ECS Reading test series. A summary of the reviewers comments are listed in Table c2i-6.

Table c2i-5 Sample Data Collection Form for Panel Reviews

Test Item	Guidelines						Comments
	1. Treats people with respect in all test materials	*2. Minimizes the effects of construct-irrelevant knowledge or skills*	*3. Avoid material that is unnecessarily controversial, inflammatory, offensive, or upsetting*	*4. Uses appropriate terminology to refer to people*	*5. Avoids stereotypes*	*6. Represents diversity in depictions of people*	
1	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
2	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
3	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
4	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
5	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
6	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
7	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
8	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
9	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
10	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	

Table c2i-6 Panel Member Comments from ECS Reading and Overall Item Decision

Form/Item #	Comment	Consensus
12/9	Signs may not be common, vocabulary unfamiliar	Keep Item
12/13	Different methods in different countries for marking year and month	Keep Item
14/12	Men at desks, women at filing cabinet	Keep Item
14/21,22	Technical vocabulary	Keep Item
15/20	Letters are very small, technical vocabulary	Keep Item
114/16	Gender specific	Keep Item
116/35	Technical vocabulary	Keep Item
213/22	Security guard referred to as "he"	Keep Item
213/24	Asks for "date" not "day"	Keep Item
215/20	May be too technical	Keep Item

Differential Item Functioning (DIF) Procedure

As mentioned under the CASAS Fairness and Sensitivity Review Procedure, items are evaluated empirically for fairness and sensitivity using Differential Item Functioning (DIF) procedures to flag any items for panel review that show statistical differences in performance. These items are then reviewed by content expert panels to determine possible reasons for the DIF results and to determine if the DIF results are sufficiently large that the task should be removed from the assessment form.

The DIF procedure is based on the work of Holland and Thayer (1986). They adapted the Mantel-Haenszel statistic from medical research to compare the performance on an item of a "focal" group to that of a "reference" group matched in overall proficiency or ability. In other words, the Mantel-Haenszel statistic is calculated to show how an examinee is responding to an item and if it is consistent with what their performance on the assessment as a whole would lead us to expect. This procedure provides a cumulative statistic of the log odds ratio of passing or failing an item for the two groups (focal and reference) that have been matched for overall proficiency or ability. This odds ratio is then converted to the Delta scale based on procedures developed at the Educational Testing Service (Holland & Thayer, 1986).

The Delta value indicates the average amount by which examinees in a focal group found an item more difficult than did a reference group. Positive values on this scale indicate that the item favors the focal group, that is, an item with a positive value is differentially easier for the focal group than the reference group. Similarly, an item with a negative Delta differentially favors the reference group over the focal group.

Based on criteria developed by ETS (DeMauro, 1990), items having a Delta statistic less than an absolute value of 1.0 are used as needed to meet the content requirements of the test specifications. Items having a Delta statistic greater than 1.0 are subjected to review by content specialists to verify and determine possible reasons, if any, for the differential item functioning. Items having a Delta statistic greater than 1.5 are only used in a test if no other item from the required domain has a lower value and the item content is deemed critical to the assessment.

Results of DIF Analysis

Tables c2i-7 through c2i-10 summarize the statistical DIF analyses by form. Items having an absolute Delta value of 1.5 or higher were subjected to a critical review by content specialists and only retained if the item content was essential to the assessment and no other item was available with a lower Delta statistic. Content specialists conducting the review included representatives from both the reference and focal groups.

Analysis by gender placed male as the reference group and female as the focal group. Ethnicity analyses were carried out with Anglo/white as the reference group and other ethnic groups as the focal group. Language analysis placed English as the reference group and speaking a language other than English as the focal group. DIF analysis was carried out for gender, ethnicity, and spoken language for the 2004-05 and 2005-06 program years.

Results from Table c2i-7 show that 26 items (8 percent of the total items) screened through DIF were identified and further reviewed by content specialists and psychometricans for gender bias or insensitivity, especially the two items (0.6 percent) with absolute values greater than 1.5.

Results from Table c2i-8 show that 37 items (11.3 percent of the total items) screened through DIF were identified and further reviewed by content specialists and psychometricans for Anglo-Hispanic ethnic bias or insensitivity, especially the eight items (2.6 percent) with absolute values greater than 1.5.

Table c2i-7 Summary of Mantel-Haenszel Analysis for Gender

Delta Difference Range				
Reading Form	Total Number of Items	Test Items with Absolute Value Less than 1.0	Test Items with Absolute Value Between 1.0 and 1.5	Test Items with Absolute Value Greater than 1.5
11	25	23	2	0
12	25	22	3	0
13	34	33	1	0
14	34	33	1	0
114	34	30	4	0
15	38	35	2	1
16	38	35	3	0
116	38	36	2	0
17	30	26	3	1
18	30	27	3	0

Table c2i-8 Summary of Mantel-Haenszel Analysis for Ethnicity (Anglo – Hispanic)

Delta Difference Range				
Reading Form	Total Number of Items	Test Items with Absolute Value Less than 1.0	Test Items with Absolute Value Between 1.0 and 1.5	Test Items with Absolute Value Greater than 1.5
11	25	19	3	3
12	25	21	3	1
13	34	33	1	0
14	34	30	3	1
114	34	27	7	0
15	38	33	4	1
16	38	35	2	1
116	38	34	4	0
17	30	28	1	1
18	30	29	1	0

Results from Table c2i-9 show that, 27 items (8.3 percent of the total items) screened through DIF were identified and further reviewed by psychometricians and subject-matter experts for Anglo-African American ethnic bias or insensitivity especially the six items (1.8 percent) with absolute values greater than 1.5.

Results from Table c2i-10 show that, 81 items (17.4 percent of the total items) screened were identified and further reviewed by psychometricians and subject-matter experts for other than English language bias or insensitivity, especially the 23 items (4.9 percent) with absolute values greater than 1.5.

Table c2i-9 Summary of Mantel-Haenszel Analysis for Ethnicity (Anglo-African American)

Delta Difference Range				
Reading Form	Total Number of Items	Test Items with Absolute Value Less than 1.0	Test Items with Absolute Value Between 1.0 and 1.5	Test Items with Absolute Value Greater than 1.5
11	25	22	3	0
12	25	23	0	2
13	34	33	1	0
14	34	32	2	0
114	34	32	2	0
15	38	36	2	0
16	38	37	0	1
116	38	31	7	0
17	30	24	4	2
18	30	29	0	1

Table c2i-10 Summary of Mantel-Haenszel Analysis for Spoken Language (English – Language Other Than English)

Delta Difference Range				
Reading Form	Total Number of Items	Test Items with Absolute Value Less than 1.0	Test Items with Absolute Value Between 1.0 and 1.5	Test Items with Absolute Value Greater than 1.5
11	25	15	7	3
12	25	18	4	3
13	34	23	8	3
14	34	25	6	3
114	34	24	8	2
213	34	29	2	3
214	34	32	1	1
15	38	36	1	1
16	38	35	2	1
116	38	27	9	2
215	36	34	1	1
216	36	35	1	0
17	30	27	3	0
18	30	25	5	0

(c2ii) The extent to which items or tasks on the test were screened for the adequacy of their psychometric properties

Both classical test theory and Rasch Item Response theory (IRT) measure the adequacy of the psychometric properties of the test items and forms. Rasch IRT is a measurement model designed to specify the relationship between observable examinee test performance on a set of items within a test form and the unobservable trait or ability measure assumed to underlie that performance. CASAS uses the Rasch item parameters and other diagnostic information during the development process to determine if any items are mis-fitting the intended measurement model. Classical Test Theory (CTT) is also employed to evaluate the difficulty of items, the correlation between item and total scores, the mean and standard deviation of test form scores, the standard error of measurement, and the reliability of the assessments.

Table c2ii-1 provides descriptive statistics for all test forms submitted in the ECS Reading Assessments. Included are the mean raw scores, standard deviations, mean p-values, and mean point bi-serial correlation coefficients. The p-value for each item shows the percentage of examinees who answered the item correctly. The point biserial correlates the performance of examinees on the item (correct or incorrect) with the total form score. A positive point biserial score for a particular item tells us that those examinees who scored higher on the overall exam were more likely to answer the item correctly. In addition, the alpha reliability coefficient, internal consistency reliability statistic Kuder-Richardson Formula 20 (KR-20), and standard error of measurement (SEM) are reported. The alpha reliability coefficient for each scale is an index of the homogeneity of each scale. It can range from 0.0 to 1.0. This statistic is appropriate only for non-speeded scales designed to measure a single trait. The alpha value is usually considered to be a lower-bound estimate of the reliability of a scale (Crocker & Algina, 1984). The KR-20 coefficient measures how well a set of items (or variables) measures a single unidimensional latent construct. Higher values (closer to 1) indicate higher average inter-item correlations and provide evidence that the items are measuring the same underlying construct. The KR-20 reliability is equivalent to Cronbach's alpha reliability.

Table c2ii-1 Descriptive Statistics by Test Form

ECS Reading Forms	No. of Items	N	Mean Raw Score	Standard Deviation	Mean P-Value	Mean Point Biserial	Alpha	KR-20
11R	25	2,672	17.58	5.54	0.703	0.72	0.88	0.90
12R	25	2,671	17.38	5.59	0.695	0.68	0.88	0.90
13R	34	8,450	23.86	7.75	0.702	0.71	0.92	0.92
14R	34	9,158	23.75	7.50	0.698	0.71	0.91	0.91
114R	34	616	23.22	7.32	0.683	0.65	0.90	0.90
213	34	238	19.49	6.16	0.573	0.51	0.83	0.83
214	34	189	19.43	6.58	0.572	0.54	0.85	0.85
15R	38	14,780	23.69	6.81	0.623	0.54	0.86	0.86
16R	38	15,621	24.55	7.70	0.646	0.59	0.89	0.89
116R	38	1,623	24.74	6.82	0.651	0.53	0.86	0.86
215	36	211	22.30	6.93	0.619	0.55	0.86	0.86
216	36	164	22.87	6.83	0.635	0.56	0.86	0.86
17R	30	10,548	18.94	6.06	0.631	0.58	0.85	0.86
18R	30	10,557	19.10	6.24	0.637	0.59	0.86	0.87

Tables c2ii-2 through c2ii-5 provide descriptive statistics by form for a set of demographic characteristic subgroups. The descriptive statistics include mean raw score, standard deviation, mean p-value, mean point biserial, and alpha reliability coefficient. The demographic characteristic subgroups include gender, ethnicity, and language groups. Viewing the statistics in these groups provides evidence as to how different population subgroups are performing on the individual test forms.

Table c2ii-2 Descriptive Statistics by Demographic Characteristic Subgroups – Level A Forms

Form	No. of Items	Sub Groups	N	Mean Raw Score	Standard Deviation	Mean P-Value	Mean Point Biserial	Alpha
11R	25	Male	1,569	17.11	5.58	0.68	0.70	0.88
		Female	1,099	18.27	5.39	0.73	0.75	0.89
		Hispanic	1,762	17.89	5.23	0.72	0.72	0.87
		White	347	16.71	6.16	0.67	0.74	0.90
		Black	356	17.34	6.15	0.69	0.76	0.91
		English Speaking	968	17.25	6.10	0.69	0.75	0.91
		Non-Eng Speaking	1,704	17.76	5.18	0.71	0.71	0.87
12R	25	Male	1,379	16.85	5.80	0.67	0.68	0.88
		Female	1,281	17.95	5.28	0.72	0.68	0.87
		Hispanic	1,631	18.06	5.36	0.72	0.69	0.87
		White	344	16.27	6.11	0.65	0.69	0.89
		Black	308	16.46	6.23	0.66	0.71	0.90
		English Speaking	841	16.60	6.12	0.66	0.70	0.89
		Non-Eng Speaking	1,830	17.73	5.29	0.71	0.68	0.87

Table c2ii-3 Descriptive Statistics by Demographic Characteristic Subgroups – Level B Forms

Form	No. of Items	Sub Groups	N	Mean Raw Score	Standard Deviation	Mean P-Value	Mean Point Biserial	Alpha
13R	34	Male	4,596	23.38	7.93	0.69	0.70	0.92
		Female	3,829	24.43	7.51	0.72	0.71	0.91
		Hispanic	4,173	23.12	7.72	0.68	0.69	0.91
		White	1,776	25.71	7.57	0.76	0.77	0.92
		Black	1,755	24.32	7.69	0.72	0.72	0.92
		English Speaking	5,372	25.37	7.58	0.75	0.75	0.92
		Non Eng Speaking	3,078	21.22	7.34	0.62	0.62	0.89
14R	34	Male	4,750	23.32	7.55	0.69	0.70	0.91
		Female	4,369	23.13	7.44	0.68	0.68	0.91
		Hispanic	5,068	22.50	7.34	0.66	0.66	0.90
		White	1,670	25.68	7.15	0.76	0.76	0.92
		Black	1,377	24.07	7.37	0.71	0.71	0.91
		English Speaking	4,388	25.36	7.12	0.75	0.75	0.91
		Non Eng Speaking	4,770	21.26	7.31	0.63	0.63	0.89
114R	34	Male	258	22.08	8.15	0.65	0.68	0.92
		Female	345	24.67	6.70	0.73	0.64	0.89
		Hispanic	355	23.60	7.03	0.69	0.63	0.89
		White	155	24.01	8.09	0.71	0.73	0.93
		Black	65	23.17	8.34	0.68	0.73	0.93
		English Speaking	210	23.83	8.77	0.70	0.77	0.94
		Non Eng Speaking	406	23.44	6.62	0.69	0.61	0.87
213R	34	Male	197	19.71	6.51	0.58	0.53	0.85
		Hispanic	204	19.60	6.15	0.58	0.51	0.83
		Non Eng Speaking	194	19.68	6.01	0.58	0.50	0.82
214R	34	Male	158	18.70	6.54	0.55	0.53	0.85
		Hispanic	154	19.03	6.60	0.56	0.55	0.86
		Non Eng Speaking	149	19.34	6.54	0.57	0.55	0.86

Table c2ii-4 Descriptive Statistics by Demographic Characteristic Subgroups – Level C Forms

Form	No. of Items	Sub Groups	N	Mean Raw Score	Standard Deviation	Mean P-Value	Mean Point Biserial	Alpha
15R	38	Male	7,415	22.83	6.77	0.60	0.52	0.85
		Female	6,819	24.68	6.74	0.65	0.55	0.86
		Hispanic	6,660	23.03	6.64	0.61	0.52	0.84
		White	3,630	26.02	6.68	0.69	0.58	0.86
		Black	2,504	22.53	6.73	0.59	0.52	0.85
		English Speaking	9,094	24.38	6.82	0.64	0.56	0.86
		Non Eng Speaking	5,686	22.60	6.65	0.60	0.51	0.84
16R	38	Male	7,539	23.96	7.70	0.63	0.58	0.89
		Female	7,773	25.29	7.55	0.67	0.60	0.89
		Hispanic	8,047	23.82	7.51	0.63	0.57	0.88
		White	3,374	27.53	7.22	0.73	0.64	0.89
		Black	2,204	23.56	7.66	0.62	0.58	0.88
		English Speaking	8,058	25.58	7.67	0.67	0.62	0.89
		Non Eng Speaking	7,563	23.45	7.59	0.62	0.57	0.88
116R	38	Male	666	24.62	7.08	0.65	0.55	0.87
		Female	955	24.85	6.66	0.65	0.52	0.85
		Hispanic	1,124	24.30	6.56	0.64	0.51	0.84
		White	258	25.93	7.71	0.68	0.62	0.90
		Black	100	23.87	7.46	0.63	0.57	0.88
		English Speaking	466	25.42	7.71	0.67	0.61	0.89
		Non Eng Speaking	1,157	24.49	6.43	0.65	0.50	0.84
215R	36	Male	210	22.25	6.91	0.62	0.55	0.86
		Hispanic	145	21.86	6.75	0.61	0.54	0.85
		English Speaking	80	22.91	6.91	0.64	0.56	0.86
		Non Eng Speaking	131	21.92	6.91	0.61	0.55	0.86
216R	36	Male	163	22.81	6.81	0.63	0.56	0.86
		Hispanic	115	23.07	6.68	0.64	0.55	0.86
		English Speaking	63	22.49	6.91	0.63	0.57	0.87
		Non Eng Speaking	101	23.10	6.76	0.64	0.55	0.86

Table c2ii-5 Descriptive Statistics by Demographic Characteristic Subgroups – Level D Forms

Form	No. of Items	Sub Groups	N	Mean Raw Score	Standard Deviation	Mean P-Value	Mean Point Biserial	Alpha
17R	30	Male	6,963	19.00	6.14	0.63	0.58	0.86
		Female	3,496	18.88	5.87	0.63	0.56	0.85
		Hispanic	3,937	17.94	5.89	0.60	0.55	0.84
		White	3,438	21.02	5.76	0.70	0.61	0.85
		Black	2,258	17.90	5.95	0.60	0.55	0.84
		English Speaking	8,156	19.52	6.00	0.65	0.58	0.85
		Non Eng Speaking	2,391	16.94	5.82	0.57	0.53	0.83
18R	30	Male	6,166	19.63	6.30	0.65	0.61	0.87
		Female	4,282	18.44	6.05	0.62	0.57	0.85
		Hispanic	4,504	18.23	6.03	0.61	0.56	0.85
		White	3,067	21.12	6.06	0.70	0.63	0.87
		Black	1,867	18.94	6.07	0.86	0.58	0.86
		English Speaking	7,196	20.09	6.12	0.67	0.60	0.86
		Non Eng Speaking	3,361	16.98	5.97	0.57	0.54	0.84

Item c3 –The procedures used to assign items

(c3i) Forms, for tests that are constructed prior to being administered to examinees

The main considerations in assigning items to forms can be summarized as follows:

- Purpose of the test
- Content Focus and Construct being measured
- Modality
- Educational Functioning Level and range of difficulty
- Length of test
- Need for parallel or alternate forms

Please refer to Item C for more detailed information on the procedures to assign items to test forms.

(d) Maintenance. Documentation of how the test is maintained

Item d1 – How frequently, if ever, new forms of the test are developed

After a test or test series has been implemented, situations may arise that call for the creation of new test forms.

In one case, agencies reported that they often had to administer a pre- and post-tests to examinees more than twice within the B and C reading test levels. This created a need for additional tests, and parallel forms 114 and 116 were created and added to the ECS Reading Assessments to provide additional alternative test forms for post-testing at these levels.

In another case, a need was expressed by implementing agencies for an appraisal/locater form with an accurate measurement range that extended high enough to place examinees directly into ASE level

classes and level D testing. Thus, the Form 130 was created to supplement the Form 120. The same was done in creating a Form 230 Workplace Appraisal to supplement the Form 220.

In some instances a test form may be revised for a new version. In other instances, updating of formatting or minor content adjustments require a new edition of a test. In some cases a problematic item may need to be replaced and a new version created.

Development of a new reading series is underway. The content of this series will be based on priority competencies and content standards determined by adult education reading experts. The content will also be aligned to the College and Career Readiness Reading standards for Adult Education and to the NRS Educational Functioning Levels for Adult Basic Education(ABE), Adult Secondary Education (ASE) and English as a Second Language (ESL).

Table d1-1 contains test form publishing information for the ECS Reading Assessments. This table shows that periodically the ECS Reading Assessments have been added to as needed based on both statistical information and feedback from teachers, test administrators, and examinees.

Table d1-1 ECS Reading Test Publishing Information

Test Form	Level	Type	Publish Date	Subsequent Editions	Computer Based Testing
11	A	Pre/Post	1988		2003
12	A	Pre/Post	1988		2003
13	B	Pre/Post	1988		2003
14	B	Pre/Post	1988		2003
114	B	Pre/Post	2000		2003
213	B	Pre/Post	2003		2007
214	B	Pre/Post	2003		2007
15	C	Pre/Post	1988		2003
16	C	Pre/Post	1988		2003
116	C	Pre/Post	2000		2003
215	C	Pre/Post	2003		2007
216	C	Pre/Post	2003		2007
17	D	Pre/Post	1996		2003
18	D	Pre/Post	1996		2003

Item d2 – The steps taken to ensure the comparability of scores across forms of the test

Item Response Theory and the comparability of scores across test forms and series

Item Response Theory (IRT) is a measurement model designed to specify the relationship between observable examinee test performance on a set of test items within a form and the unobservable trait or measured ability assumed to underlie that performance. IRT is the fundamental measurement model and procedures used to ensure comparability of scores across different CASAS forms and test series. Multiple banks of field-tested, calibrated items are used to develop specific CASAS assessment instruments and test series, including the ECS Reading Assessments. Although the development of CASAS assessment instruments from the multiple item banks are based on many traditional psychometric procedures including the preparation of test specifications, sound item writing practices, and both the pilot and field-testing of items using classical item analysis procedures, the underlying theoretical measurement foundation is IRT.

One major task in building and maintaining an item bank is to place all the items in a given learning modality, such as reading, listening, or mathematics, on a common measurement scale. This involves calibrating the level of difficulty of each item within the content domain. An item bank can be developed by computing the item difficulty estimates from all examinees' responses to all items. However, establishing an item bank typically requires many more items than can be given in one test or far more than a single examinee can be realistically expected to answer in a reasonable amount of time. For each test series, such as ECS Reading, CASAS chose to develop calibration forms having the same domain coverage with similar content coverage and a range of difficulty. Expert teachers in the domain judged the item content similarity and range of difficulty to be appropriate for examinees participating in the initial calibration forms study. On all initial forms more than 95 percent of test examinees responded to all items.

The characteristic of the Rasch and other IRT models, which makes them appropriate for item banking, is that they separately measure an item difficulty calibration from the ability or proficiency of the group taking the item. This makes it possible to do horizontal and vertical equating of scores from different test forms of the same difficulty level (horizontal equating) or increasing difficulty levels (vertical equating) within a content domain. This allows for the measurement of achievement gains between the administrations of two different sets of items to the same examinee over a specified instructional time period. The use of an item banking model with Rasch IRT parameters for each item allows the development of a more general curriculum-based or common content domain scale that measures specific content and competencies in a variety of adult employment preparation and workplace situations.

Results presented in other items of this submission, notably Item e for match of content and Item g for degree of consistency across different forms, provide evidence that parallel forms within the ECS Reading Assessments are comparable in content and difficulty (as demonstrated in the raw to scale score correlations between parallel forms).

Initial Calibration and Linking of Forms

To fully explain the calibration and linking process used for the ECS Reading Assessment, it is necessary to describe the process used to calibrate and link the initial CASAS assessments.

CASAS conducted the initial calibration of items in the fall of 1980 based on ten test forms. All forms contained basic life skills items measured in a functional life skills context. Since math in a functional context requires the ability to read, these items were initially included on the reading scale. A total of 4,115 examinees enrolled in adult basic education programs, including ESL and high school completion, participated in this first item calibration of 422 items.

In order to place all items on a single scale, sets of 8-10 common linking items were embedded among the ten forms. One calibration form was chosen as the "anchor" test to which all other tests were directly linked to establish the common content domain scale. The choice of an anchor test form was made following an earlier decision to focus on the development and selection of life skills competencies appropriate to a mid-range achievement level, that of intermediate ABE and ESL participants. This population was chosen because it had more experience in the classroom and with taking tests and was judged to be broadly representative of adult learners in general. The anchor form was also designed so that these examinees would respond successfully to more than 50 percent of the items. It was also decided to center the scale at this same mid-range achievement level and to convert the logit metric to a three-digit numerical scale by multiplying the logit scale by 10 and adding 200. This established the initial scaling of the CASAS tests with a mean of 200 and a standard deviation of 10 scale points.

Standard test form linking procedures were used to consecutively link each test form to the common IRT scale established by the anchor form. The calibrated item parameters from the linking items on each calibration form were used to compute scale transformation values for placing the non-linking items the same common measurement scale. This linking process was continued for each of the ten calibration forms. This first series of calibration forms also included items appropriate for beginning and advanced levels of ABE and ESL.

The actual calibration of items followed the recommendations of Wright (1968) and the experience of the Northwest Evaluation Association (Ingebo and Forster 1980) to include only those item response sets for those who had responded correctly to more than 20 percent and fewer than 90 percent of the items on the test. The exclusion of responses from the lower success range minimized the influence of including results for those who may have been guessing. One additional restriction eliminated results for examinees who did not have at least one correct answer on the last half of the test.

Model Data Fit

During the calibration process, all items were examined to determine their level of model fit to the Rasch Model. Individual forms were independently subjected to a one-parameter analysis using BICAL as the Rasch item calibration program (Wright & Mead, 1977). The two mean-square residual summary statistics, infit and outfit, were used to determine the degree of fit to the Rasch model. Although no hard-and-fast rules were used to identify misfitting items, those items with either infit or outfit values less than .7 or greater than 1.3 were reviewed by psychometricians and subject-matter experts and eliminated if not essential to the measurement of the competency statement.

Following this procedure, 863 student item response sets were then included for item calibration for the anchor form per content domain. This sample size was more than adequate to establish accurate calibrations. Research accomplished by the Northwest Evaluation Association indicated a sample size of 300 to be adequate for calibration purposes (NWEA, 1979). The remaining nine calibration forms were then scaled and linked to the base anchor form per content domain. All calibration forms met the minimum requirement of having at least 300 examinees respond to each item.

In addition to individual item responses on these item calibration forms, demographic and program descriptor information (including age, sex, ethnicity, primary language, number of years of school completed and program level enrollment) was collected for all learners in the initial item and form-linking calibrations.

In the spring of 1981, 16 additional item calibration forms were administered to 4,606 learners enrolled in Adult Basic Education, English as a Second Language, and high school completion programs. Items from the fall 1980 item calibrations were included in these forms to serve as linking items for the item calibration process. Items from these two administrations were extensively analyzed, and those test items that met the assumptions of the Rasch Model were then included in the initial item banks. The BICAL program (Wright & Mead, 1977) was used for the initial calibration of the CASAS item banks. Subsequent calibration programs used include RASCAL (Assessment Systems Corporation, 1989) and the Rasch program currently in use, WINSTEPS (Linacre, 2003). Each of these programs has been widely used in the psychometric research literature to calibrate educational test items.

Ongoing Item Bank Expansion

CASAS items are developed in response to a request for an approved test development project or to expand an existing item pool to meet future test construction needs. When item development is targeted to a specific assessment development project, a needs assessment is conducted to identify the priority content and skill areas to be measured for each assessment. For assessment development intended for adult education programs, adult education professionals are surveyed to identify and prioritize relevant content domains, usually expressed in the form of life-skill competencies and basic skill content standards. Surveys are prepared and distributed or electronically disseminated to adult education agencies across the country. The results from these surveys provide guidance to item and test development.

In addition to identifying target content domains, an initial step in planning item development is identifying the number of items that need to be created. Items undergo an extensive review and pilot testing process and item attrition will occur at several stages of the process. About three times the number of items needed for the final calibrated test form are generated during the item development process. For example, if two 32-item test forms at an intermediate adult proficiency level are needed, a total of 200 initial draft items are written to ensure a minimum of 80 calibrated items are available for selecting the final test forms and items. This provides flexibility to have enough calibrated items that are aligned with the test specifications for both content coverage and range of difficulty on a test form.

Please refer to Item C for a detailed description of the procedures followed to expand the item bank and a historical summary of the expansion of the CASAS item bank.

Raw to Scale Score Conversion

The parallel forms on the ECS Reading Assessments are designed to perform identically for similar examinees taking the parallel forms of the tests. From the correlations of over .99, more than 98 percent of the variation can be accounted for when comparing raw and scale scores among parallel forms. This means a given raw score achieved on either parallel form (for example 11R or 12R) will translate to essentially the same scale score across the two test forms. Table d2-1 below illustrates the one-to-one relationship between raw score to scale conversions on parallel forms of the ECS Reading Assessments. Because of this relationship the raw to scale score correlations of parallel forms will always approach 1.

Table d2-1 Raw to Scale Score Correlations of ECS Reading Parallel Forms

Reading Level	Correlation	Parallel Form Numbers
A	0.99	11 with 12
B	0.99	13 with 14
B	0.99	13 with 114
B	0.99	213 with 214
C	0.99	15 with 16
C	0.99	15 with 116
C	0.99	215 with 216
D	0.99	17 with 18

The following tables, d2-2 through d2-5, provide raw to scale score conversion charts along with the conditional standard error of measurement (CSEM) of the scale score for each measurement point for the ECS reading forms. The CSEM provides an estimate of the average test score measurement error conditional on the proficiency estimate. This means that it provides an error estimate at each score point. Results presented in Tables d2-2 through d2-5 show that the CSEM is smallest with scores in the middle of the distribution. This is to be expected as Rasch IRT makes it clear that precision is not uniform across the entire range of test scores. Typically there is more information about learners with scores in the middle of the score distribution and the scores are more reliable. Tables d2-2 through d2-5 signify scores in the accurate range with a vertical bar. Conversely scores at the edges of the range of the test generally have a higher CSEM and provide less reliable information. Scores that have a corresponding CSEM of 5.6 or greater have scale estimates that are above the accurate range and are signified at the high end with a diamond symbol (♦).

Table d2-2 Raw to Scale Score Conversion with CSEM – Level A Forms

Form 11			Form 12		
Raw Score	Scale Score	CSEM	Raw Score	Scale Score	CSEM
1	149	10.5	1	149	10.5
2	157	7.8	2	157	7.7
3	162	6.6	3	162	6.6
4	166	6.0	4	166	5.9
5	169	5.5	5	169	5.5
6	172	5.0	6	172	5.2
7	175	4.9	7	175	5.0
8	177	4.7	8	177	4.9
9	180	4.7	9	180	4.7
10	182	4.6	10	182	4.7
11	184	4.6	11	184	4.6
12	186	4.5	12	186	4.6
13	188	4.5	13	188	4.6
14	190	4.5	14	190	4.6
15	192	4.6	15	192	4.6
16	194	4.6	16	194	4.7
17	197	4.7	17	197	4.8
18	199	4.9	18	199	4.9
19	202	5.1	19	202	5.1
20	204	5.4	20	204	5.4
21	206♦	5.8	21	205♦	5.8
22	207♦	6.4	22	206♦	6.5
23	208♦	7.6	23	207♦	7.6
24	210♦	10.4	24	209♦	10.4
25	211♦		25	210♦	

Table d2-3 Raw to Scale Score Conversion with CSEM – Level B Forms

Form 13			Form 14			Form 114			Form 213			Form 214		
Raw Score	Scale Score	CSEM	Raw Score	Scale Score	CSEM	Raw Score	Scale Score	CSEM	Raw Score	Scale Score	CSEM	Raw Score	Scale Score	CSEM
1	168	10.2	1	169	10.2	1	169	10.2	1	168	10.2	1	168	10.2
2	176	7.4	2	176	7.4	2	176	7.4	2	176	7.4	2	176	7.4
3	180	6.2	3	181	6.2	3	180	6.2	3	180	6.2	3	180	6.1
4	184	5.5	4	184	5.5	4	184	5.4	4	184	5.4	4	184	5.4
5	186	5.0	5	187	5.0	5	186	5.0	5	186	5.0	5	186	5.0
6	189	4.7	6	189	4.7	6	189	4.7	6	189	4.6	6	189	4.6
7	191	4.4	7	191	4.4	7	191	4.4	7	191	4.4	7	191	4.4
8	193	4.2	8	193	4.2	8	193	4.2	8	192	4.2	8	192	4.2
9	194	4.1	9	195	4.1	9	194	4.1	9	194	4.1	9	194	4.0
10	196	3.9	10	196	4.0	10	196	3.9	10	196	3.9	10	196	3.9
11	197	3.8	11	198	3.9	11	198	3.9	11	197	3.8	11	197	3.8
12	199	3.8	12	199	3.8	12	199	3.8	12	199	3.8	12	199	3.8
13	200	3.7	13	201	3.7	13	200	3.7	13	200	3.7	13	200	3.7
14	202	3.7	14	202	3.7	14	202	3.7	14	202	3.7	14	202	3.7
15	203	3.6	15	204	3.6	15	203	3.6	15	203	3.6	15	203	3.6
16	204	3.6	16	205	3.6	16	204	3.6	16	204	3.6	16	204	3.6
17	206	3.6	17	206	3.6	17	206	3.6	17	205	3.6	17	205	3.6
18	207	3.6	18	207	3.6	18	207	3.6	18	207	3.6	18	207	3.6
19	208	3.6	19	209	3.6	19	208	3.6	19	208	3.6	19	208	3.6
20	210	3.7	20	210	3.7	20	210	3.7	20	209	3.7	20	209	3.7
21	211	3.7	21	212	3.7	21	211	3.7	21	211	3.7	21	211	3.7
22	212	3.7	22	213	3.8	22	212	3.8	22	212	3.8	22	212	3.8
23	214	3.8	23	214	3.8	23	214	3.8	23	214	3.8	23	214	3.8
24	215	3.9	24	216	3.9	24	215	3.9	24	215	3.9	24	215	3.9
25	217	4.0	25	217	4.1	25	217	4.0	25	217	4.0	25	217	4.0
26	218	4.2	26	219	4.2	26	219	4.2	26	218	4.2	26	218	4.2
27	220	4.4	27	221	4.4	27	220	4.4	27	220	4.4	27	220	4.4
28	222	4.6	28	223	4.6	28	223	4.6	28	222	4.6	28	222	4.6
29	225	5.0	29	225	5.0	29	225	4.9	29	224	5.0	29	224	5.0
30	227	5.4	30	228	5.5	30	228	5.4	30	227	5.4	30	227	5.4
31	229♦	6.1	31	230♦	6.2	31	230♦	6.2	31	228♦	6.1	31	228♦	6.1
32	230♦	7.4	32	231♦	7.4	32	231♦	7.5	32	229♦	7.4	32	229♦	7.4
33	232♦	10.2	33	233♦	10.2	33	233♦	8.7	33	231♦	8.7	33	231♦	8.7
34	233♦		34	234♦		34	234♦		34	232♦		34	232♦	

Table d2-4 Raw to Scale Score Conversion with CSEM – Level C Forms

Form 15			Form 16			Form 116			Form 215			Form 216		
Raw Score	Scale Score	CSEM	Raw Score	Scale Score	CSEM	Raw Score	Scale Score	CSEM	Raw Score	Scale Score	CSEM	Raw Score	Scale Score	CSEM
1	181	10.2	1	182	10.2	1	181	10.2	1	183	10.2	1	183	10.2
2	189	7.3	2	190	7.3	2	189	7.3	2	190	7.3	2	190	7.3
3	193	6.1	3	194	6.1	3	193	6.1	3	195	6.1	3	195	6.1
4	196	5.4	4	197	5.4	4	196	5.4	4	198	5.4	4	198	5.4
5	199	4.9	5	200	4.9	5	199	4.9	5	200	4.9	5	200	4.9
6	201	4.5	6	202	4.5	6	201	4.6	6	203	4.6	6	203	4.6
7	203	4.3	7	204	4.3	7	203	4.3	7	205	4.3	7	205	4.3
8	205	4.1	8	206	4.1	8	205	4.1	8	206	4.1	8	206	4.1
9	206	3.9	9	207	3.9	9	206	4.0	9	208	4.0	9	208	4.0
10	208	3.8	10	209	3.8	10	208	3.8	10	210	3.9	10	210	3.9
11	209	3.7	11	210	3.7	11	209	3.7	11	211	3.8	11	211	3.8
12	211	3.6	12	212	3.6	12	211	3.6	12	212	3.7	12	212	3.7
13	212	3.5	13	213	3.5	13	212	3.5	13	214	3.6	13	214	3.6
14	213	3.5	14	214	3.5	14	213	3.5	14	215	3.6	14	215	3.6
15	214	3.4	15	215	3.5	15	214	3.5	15	216	3.5	15	216	3.5
16	216	3.4	16	217	3.4	16	216	3.5	16	218	3.5	16	218	3.5
17	217	3.4	17	218	3.4	17	217	3.4	17	219	3.5	17	219	3.5
18	218	3.4	18	219	3.4	18	218	3.4	18	220	3.5	18	220	3.5
19	219	3.4	19	220	3.4	19	219	3.4	19	221	3.5	19	221	3.5
20	220	3.4	20	221	3.4	20	220	3.4	20	223	3.5	20	222	3.5
21	221	3.4	21	222	3.4	21	222	3.5	21	224	3.5	21	224	3.5
22	222	3.4	22	224	3.4	22	223	3.5	22	225	3.6	22	225	3.6
23	224	3.4	23	225	3.5	23	224	3.5	23	226	3.6	23	226	3.6
24	225	3.5	24	226	3.5	24	225	3.6	24	228	3.7	24	228	3.7
25	226	3.6	25	227	3.6	25	227	3.6	25	229	3.8	25	229	3.8
26	227	3.6	26	228	3.6	26	228	3.7	26	231	3.9	26	231	3.9
27	229	3.7	27	230	3.7	27	229	3.8	27	232	4.0	27	232	4.0
28	230	3.8	28	231	3.8	28	231	3.9	28	234	4.2	28	234	4.2
29	232	4.0	29	233	4.0	29	232	4.0	29	236	4.4	29	236	4.4
30	233	4.1	30	234	4.1	30	234	4.2	30	238	4.6	30	238	4.6
31	235	4.3	31	236	4.3	31	236	4.4	31	240	5.0	31	240	5.0
32	237	4.6	32	238	4.6	32	238	4.6	32	243	5.4	32	243	5.4
33	239	4.9	33	240	5.0	33	240	5.0	33	245♦	6.1	33	245♦	6.1
34	242	5.4	34	243	5.4	34	243	5.4	34	247♦	7.4	34	247♦	7.4
35	243♦	6.1	35	244♦	6.2	35	244♦	6.1	35	249♦	8.7	35	249♦	8.7
36	245♦	7.4	36	245♦	7.4	36	245♦	7.4	36	251♦		36	251♦	
37	247♦	10.2	37	247♦	10.2	37	247♦	8.7						
38	249♦		38	249♦		38	249♦							

Table d2-5 Raw to Scale Score Conversion with CSEM – Level D Forms

Form 17			Form 18		
Raw Score	Scale Score	CSEM	Raw Score	Scale Score	CSEM
1	200	10.2	1	200	10.2
2	208	7.4	2	208	7.4
3	212	6.2	3	212	6.2
4	215	5.5	4	215	5.5
5	218	5.0	5	218	5.0
6	220	4.7	6	221	4.7
7	223	4.5	7	223	4.5
8	224	4.3	8	225	4.3
9	226	4.1	9	226	4.2
10	228	4.0	10	228	4.1
11	230	4.0	11	230	4.0
12	231	3.9	12	231	3.9
13	233	3.9	13	233	3.9
14	234	3.9	14	234	3.9
15	236	3.9	15	236	3.9
16	237	3.9	16	237	3.9
17	239	3.9	17	239	3.9
18	240	3.9	18	240	4.0
19	242	4.0	19	242	4.0
20	243	4.1	20	244	4.1
21	245	4.2	21	245	4.2
22	247	4.4	22	247	4.4
23	249	4.5	23	249	4.5
24	251	4.8	24	251	4.8
25	254	5.1	25	254	5.1
26	256♦	5.6	26	256♦	5.6
27	258♦	6.3	27	258♦	6.3
28	261♦	7.4	28	261♦	7.5
29	264♦	8.6	29	264♦	8.6
30	267♦		30	267♦	

Item d3 – The steps taken to maintain the security of the test

CASAS ascribes to all the rights and responsibilities of test administrators, proctors, and test takers as spelled out in the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 1999). Test security policy issues are discussed on an ongoing basis with the CASAS National Policy Council and National Consortium member state representatives at biannual meetings and special conference calls. CASAS, together with the National Consortium members, has developed, and updates as necessary, state and local assessment policy guidelines regarding how security concerns should be reported, the score appeal processes, and the rights and responsibilities of test administrators, proctors, and test takers. CASAS recommends that states incorporate these policy guidelines into their state and local-level assessment policies. Overall responsibility for test security policy rests with both the director of assessment development and the director of program development.

Test security is maintained throughout the life cycle of all CASAS testing, from development to administration and the scoring and reporting stages.

Item and Test Security during Development and Field Testing Process

The item and test development department is responsible for all aspects of the development and field-testing process. The item materials are kept secure at the CASAS offices and access is limited to authorized members of the item and test development department. During the field-test process, materials are sent to the test administrator who is instructed on procedures and policies to keep field-test materials secure. More information on test administration policies is provided below.

Upon completion of the field-testing, all test materials are returned to CASAS, and each test booklet is logged in and checked off to ensure that all booklets are accounted for. At CASAS offices all forms are kept in a secure location and access to items and test forms is strictly controlled and limited to members of the item and test development department, the research and development department, and in the case of items to be sent or received by CASAS, the shipping and receiving department.

CASAS Item Bank

The item bank for the ECS Reading series is organized to be a comprehensive source of information for the item and test developers. The database consists of easy-to-reference and up-to-date information on each item. Item C in this document describes the information contained in the CASAS item bank for the ECS Reading series.

CASAS policy is to have a selection of reserve items in the CASAS Reading item bank. These reserve items span the difficulty levels and content areas for each reading test series and provide a pipeline of available items.

These reserve items are available should specific items become compromised and it is determined that these items must be replaced. These items are also available if CASAS determines, through the continuous analysis of psychometric properties, that an item or item set does not remain reliable, valid, fair, or sensitive to demographic groups.

Access to the CASAS item bank is strictly controlled and the bank is stored on a secure file server location and access is limited to members of the item and test development department and the research and development department. These security controls eliminate unauthorized access.

Test Publication and Distribution

Detailed records are maintained by CASAS regarding the distribution of all exam materials. The responsibilities of test administrators are detailed below. During and after the publication process all electronic materials are stored on a secure file server. Access is limited to members of the item and test development department, research and development department, and in the case of items to be delivered or received by CASAS, the shipping and receiving department. As with the distribution of field-testing materials, the distribution of all test materials is strictly controlled and all testing material inventory must be reconciled and accounted for.
This chain-of-custody process in place specifies the responsible CASAS staff at each step of the development, publication, and distribution process.

Security and Confidentiality of Examinee Data

All examinee field-test answer sheets are returned to CASAS where they are scored on site. All answer sheets and subsequent databases containing test information and results are stored in secure files.

Access to examinee data is strictly controlled and limited to the item and test development department and the research and development department. Before items are analyzed by members of the Research and Development Department, student-level identifying information is removed from the data files. When examinee data is analyzed as part of the process to determine the continued validity and reliability of test scores, all identifying variables are removed from the datasets and any summary reports. Test professionals who have access to examinee data and results must sign confidentiality agreements. When aggregate examinee results are supplied to outside parties, the permissible use of these results is communicated to these parties. Outside parties are educated on the proper interpretation of scores. In addition, possible incorrect uses of examinee information and scores are identified and communicated to outside parties using the scores or test results.

As described above, for ongoing test security of existing test forms, local agencies are instructed during required training on the procedures and processes they are mandated to follow. In addition to test security information covered during training, all agencies automatically receive test administration manuals that include required test security measures. The test administration manuals (TAMs) for all CASAS assessments contain information on test security as presented in Tables d3-1 and d3-2.

All CASAS software applications are encrypted including databases and program files. The software applications are password protected with the ability to set different permissions and access levels for individual users. All online data transfer and updates use HHTPS, a secure file transfer protocol that provides encryption and a secure channel over an insecure local network system.

Test Administrators Responsibilities

In accordance with Standard 13.10 of *The Standards of Educational and Psychological Testing* (AERA, APA, & NCME, 1999), the CASAS professional development department provides training and training materials to test administrators. When an agency places an order for CASAS assessments, the test coordinator must sign a Training and Test Use Agreement as presented in Table d3-2. The test coordinator must indicate who has been trained, date and location of training, and name of the CASAS certified trainer. This information is verified at the CASAS office by the customer service department before an order can be processed and shipped. If an agency has not completed training, that agency is provided with training options, and CASAS test materials are not shipped until the agency has satisfactorily met the training requirement. Table d3-1 below includes the information provided in the CASAS test administration manual.
A test administrator or proctor must be present at all times during any testing session. If there are more than 25 examinees, CASAS requires that a second additional proctor be present. During administration of the CASAS exams, the responsibility for maintaining test security is the responsibility of the test administrator or proctor. Proctors are trained to observe examinees to ensure that they are not using prohibited materials or devices. For example, proctors must be aware that small electronic devices such as cell phones, voice recorders, and personal digital assistants are not used to capture the items to which examinees are exposed. Proctors are instructed to verify examinee identity and communicate to examinees the importance of not sharing information regarding specific items with others.

Table d3-1 CASAS Test Security Policy from Test Administration Manual

CASAS publishes this test security policy to maintain the integrity of each of its assessments and to assist with the implementation of and adherence to the test security practices contained in this document. Administrators and testing personnel are responsible for following these practices and ensuring that agency staff are aware of and follow said practices.

It is the immediate legal responsibility of the agency director, principal, or other primary administrator to enforce securing testing materials *upon taking delivery of materials and at all times afterward.* Only testing personnel and others qualified as part of the testing process may have access to any testing materials.

Security of Testing Materials

All testing materials, including but not limited to computerized-testing versions of CASAS eTests, whether online or desktop, test booklets, CDs, answer sheets, and answer keys, must be kept *secure.*

No unauthorized personnel should be allowed access to CASAS eTests or to paper test booklets. Security procedures for computerized-testing and paper test booklets must be held to the same standard.

Test Administration

Testing personnel must remain in the testing room throughout an entire test session to ensure that students follow all testing rules. Examinees must sit three to five feet apart and refrain from talking during the testing session or seeking help from others in any way, including use of electronic devices.

Testing personnel must ensure that they follow all test administration directions and language as dictated in the appropriate CASAS Test Administration Manual.

> ***CASAS eTests*:** CASAS will occasionally embed unpublished test items into operational CASAS eTests in order to maintain and build its item bank. These items are not scored. The security of these items cannot be compromised and must be maintained in the same manner as all testing materials.
>
> ***Paper test booklets**:* Paper test booklets and related test support materials should be kept in locked storage at all times when not in use. Prior to distribution of test booklets, the test administrator must number each test booklet for tracking purposes. As examinees finish the test, they must put their answer sheet inside their test booklet and wait until the conclusion of the testing session. The administrator must ensure that each test booklet is returned before anyone leaves the testing facility.

Confidentiality of Tests and Test Items

No agency, school, or other entity may use any CASAS test or test item – published or unpublished – as a tool to prepare examinees for the testing process. CASAS tests may never serve as practice tests in any capacity or for any purpose. Test items may not be reviewed, discussed, or explained to anyone at any time.

> ***Paper test booklets:*** If test booklets have been marked in or torn, agencies should shred these test booklets. If an agency is transitioning to a new test series, CASAS requests that

agencies shred old test booklets and destroy related testing materials including CDs. It is never appropriate to retain test materials for use as a practice test or for instructional purposes.

No agency, school, or other testing entity may share or provide any testing materials to another agency or school. Agencies that make such requests should be advised to contact CASAS directly. Testing materials must remain at the testing site at all times.

Copyright Infringement
No test materials may be duplicated, photocopied, or reproduced in any manner. Federal copyright law prohibits unauthorized reproduction and use of copyrighted test materials. Reproducing test materials is a violation of federal copyright law.

Test Security Policy
Agency directors, principals, and other primary administrators need to maintain a specific test security policy that discusses the proper handling and use of test materials.

All testing personnel must sign the **Test Security Policy** statement below agreeing to uphold the security policies of the agency, school, or testing entity.

Should CASAS determine that any agency, school, or other testing entity has violated any provision of this test security policy or that testing materials have been compromised in any manner, purposely or otherwise, CASAS reserves the right to take appropriate action to rectify the violation of its test security policy.

Table d3-2 Agency Test Security Policy from Test Administration Manual

To protect the quality and standardization of CASAS assessments, I agree to:

1. Follow all test procedures as required in this Test Security Policy document.
2. Secure all CASAS test materials, whether paper-based or computer delivered, under lock and key except during testing sessions.
3. Ensure that before or after any test administration all test materials are secure and inaccessible to any non-testing personnel, examinees, or others not responsible for test administration.
4. Remain in the testing room at all times during the testing event and monitor all examinee activity as appropriate and in compliance with test security procedures.
5. Ensure that examinees sit at least three to five feet apart and do not talk or seek help from others during the testing event in any way, including use of electronic devices.
6. Refrain from assisting examinees with test answers on any test before or during the testing event.
7. Refrain from reviewing test questions with examinees after the testing event.
8. Ensure that agency staff members follow all specific testing procedures as stated in CASAS Test Administration Manuals.
9. Disallow use of any CASAS assessments as practice tests or as instructional tools.
10. Advise any agency, school, or testing entity to contact CASAS, and not my agency, with any inquiry about sharing or duplicating CASAS testing materials.
11. Refrain from duplicating or in any way reproducing any CASAS testing materials, including but not limited to test booklets, answer keys, answer sheets, CDs, and CASAS eTests.
12. Report any violation of this test security policy.

My signature on this document certifies that I have read the above policy, will follow all test administration directions as stated in my CASAS Test Administration Manual, and agree to abide by all test security procedures.

Signature	Position/Title	Date

Print Name

Detecting and Reporting Security Concerns

All users of CASAS tests are to have procedures in place for any instance where the security of an examination has, or is suspected of having been breached. As agreed to by CASAS and National Consortium members, all security concerns are to be reported to the local assessment coordinator. If a matter is not resolved, the concern is to be referred to the state assessment coordinator. State staff members are required to monitor WIA II funded programs on an annual basis to make sure test security procedures are being followed. All users of CASAS tests are provided contact information to report directly to CASAS any information related to the security of CASAS items and test forms, including the potential compromise of test items.

In addition, CASAS reviews aggregate test data on a yearly basis to examine potential security concerns including improper or fraudulent test usage. This includes improper use by test administrators and teachers. CASAS conducts a series of data integrity checks by which CASAS is able to help identify potential misuse. Training sessions and the ECS Reading Test Administration Manual (TAM) strongly emphasize the inappropriateness of improper test preparation including teaching to specific items. The manual states:

It is prohibited for any individual, school, program, or business enterprise to develop any workshop, training or instructional session or create any materials designed to teach or prepare students to answer specific questions that appear on any CASAS test.

CASAS has an item and test security monitoring group to monitor the potential for illegal sharing of CASAS test items or improper test preparation. This monitoring is done via internet searches, regular meetings with trainers and program specialists, meetings with the research and development department, and review of data integrity reports. Any suspicion of improper usage is addressed immediately through a meeting with CASAS executive management. The item and test security monitoring group and CASAS executive management team decide on the proper course of action. This may involve requesting the development of additional items and scheduling pilot studies and field-test studies, replacing or retiring compromised items or forms, requesting the analysis of data or other studies to determine the scope of the issue, and initiating appropriate action against parties using CASAS items or tests in an inappropriate manner.

CASAS Response to Security Concerns

As mentioned above, if a potential security concern is detected, the CASAS item and test security monitoring group meets with CASAS management. Based on the issue, the item and test development department and the research and development department will also be included in discussions to address the appropriate next steps in each of the following areas:

- What evidence has been obtained regarding the security concern?
- What is the extent/potential impact of the security concern?
- Potentially what communication is required to CASAS test users?

- Potentially what other communication is needed (media release, etc.?)
- What additional analyses need to be conducted regarding this concern?
- Based on the decisions made, what replenishing of the CASAS item bank may be necessary?

All communication from CASAS to CASAS test users is through the director of assessment development and the director of program development.

Test Taker Rights

All users of CASAS tests are to have the right to appeal a test score as described in Standard 8.13 in the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 1999). As agreed to by CASAS and National Consortium members, test score appeals are to be reported to the local assessment coordinator. If a matter is not resolved, the concern is to be referred to the state assessment coordinator. If a local agency contacts CASAS directly, the person is referred to their state assessment coordinator.

Other test taker rights also follow the guidelines outlined by the *Standards for Educational and Psychological Testing*:

- Examinees whose results are invalidated are informed of available means of appeal or recourse (Standard 8.13).
- CASAS arranges for rescoring of examinee scores upon request (Standard 11.10).
- Examinees are informed of CASAS retake and reporting policies (Standard 11.12).
- The purpose of the testing is explained to students – that there are no pass or fail scores, that pretests are to inform instruction, and that post-tests are to measure progress (Standard 8.2).
- Test results and score interpretations are shared with examinees in language that the examinee should reasonably be expected to understand (Standard 12.20).
- Examinees are offered up to three retest opportunities to succeed on equivalent forms of the ECS Reading assessments. CASAS guidelines state that the recommended interval between consecutive pre- and post-test administrations is between 70-100 hours (Standard 13.6)

Item Exposure Analysis

As part of periodic psychometric maintenance for assessment programs, CASAS evaluates the stability of item parameter estimates over time (Wendler & Walker, 2006). If item characteristics substantively change over time, it raises a potential threat to the validity of intended score use and interpretations. When these item parameter changes influence decisions about items or the scale, it is often called item parameter drift or scale drift (Yen & Fitzpatrick, 2006). As outlined in Standard 4.17 of *The Standards of Educational and Psychological Testing*, CASAS periodically checks the stability of the measurement scale and the respective scores on the scale. To evaluate item parameter drift, CASAS conducts two types of analyses. First, CASAS analyzes classical item statistics across all items contained in the item bank. Because classical test theory statistics are sample dependent, a second level of analyses occurs at the item level and relies on IRT principles to control for different abilities. Using IRT, specifically the Rasch model, differential item functioning (DIF) analyses are conducted using item performance from different testing periods as the reference and focal groups to examine if there are any statistically significant changes in item functioning over different testing periods.

(e) Match of the content to the NRS educational functioning levels (content validity). Documentation of the extent to which the items or tasks on the test cover the skills in the NRS educational functioning levels

Item e1 – Whether the items or tasks on the test require the types and levels of skills used to describe the NRS educational functioning levels

CASAS has developed a variety of documentation to provide evidence as to the comparability of test content to the types and levels of skills used to describe the NRS educational functioning levels.

Figure e1-1 presents the relationship between content standards and competencies. The CASAS assessment system links and aligns the following key elements: curriculum (including specified underlying basic skills content standards as well as competencies negotiated and agreed upon by at least an 80 percent consensus of a national consortium of states using CASAS), suggested instructional materials and guides aligned to assessments and indexed to competencies and task areas, and assessments aligned with the competencies and content standards, as well as instructional materials. This provides the base of information needed to support and reinforce the learning process. Assessment becomes an integral part of instruction and instruction becomes targeted to the identified needs of learners. Through this system, the progress of each student can be monitored so that the agency and the learner are aware of specific outcomes or goals attained.

Tables e1-1 through e1-3 directly compare the NRS Basic Reading and Writing and Functional and Workplace Skills Level Descriptors to the corresponding CASAS Reading/Writing and Employability Skill Level Descriptors.

Table e1-4 provides information on the content standards measured by the ECS Reading Assessments. Content standards, for ABE, ASE, and ESL programs are defined as clear statements about what learners should know and be able to do at specific points along an educational pathway. They are used together with CASAS Competencies to guide and focus instruction. Table e1-4 lists all the content standards addressed by the forms in the ECS Reading Assessments. The table lists the total number of items per ECS Reading form (data is provided for one form for each set of parallel forms) that address each content standard. In addition, the corresponding NRS educational functioning level for each content standard is identified for ESL, ABE, and ASE. For example, content standard R1.1 is: *Identify the letters of the English alphabet (upper and lower case).* This content standard includes skills associated with NRS ESL educational functioning levels 1 and 2 and NRS ABE educational functioning level 1.

R1.1 "Identify the letters of the alphabet" is typically taught and mastered at **NRS levels 1 and 2** in ESL and **NRS level 1** in ABE

		TEST FORMS ▶												ECS FORM 11	ECS FORM 12	ECS FORM 13	ECS FORM 14
		ESL						ABE				ASE					
	NRS LEVEL ▶	1	2	3	4	5	6	1	2	3	4	5	6				
	CASAS LEVEL ▶	A	A	A	B	B	C	D	A	B	B	C	D	E				
	Content Standards ▼																
R1	**Beginning literacy / phonics**																
R1.1	Identify the letters of the English alphabet (upper and lower case)	•	•						•						25	25			
R1.2	Recognize that letters make words and words make sentences	•							•						25	25			
R1.3	Read from left to right, top to bottom, front to back	•							•						25	25			

Contend standard R1.1 is assessed in 25 test items in ECS Form 11

Table e1-5 through e1-18 provides information on the specific competency addressed by each item on each form of the ECS Reading Assessments. Competencies specifically identify the skills that learners will obtain and be measured on and are aligned to the content standards. They help form the basis of the CASAS integrated assessment and curriculum management system.

Figure e1-1 Underlying Basic Skills Content Standards

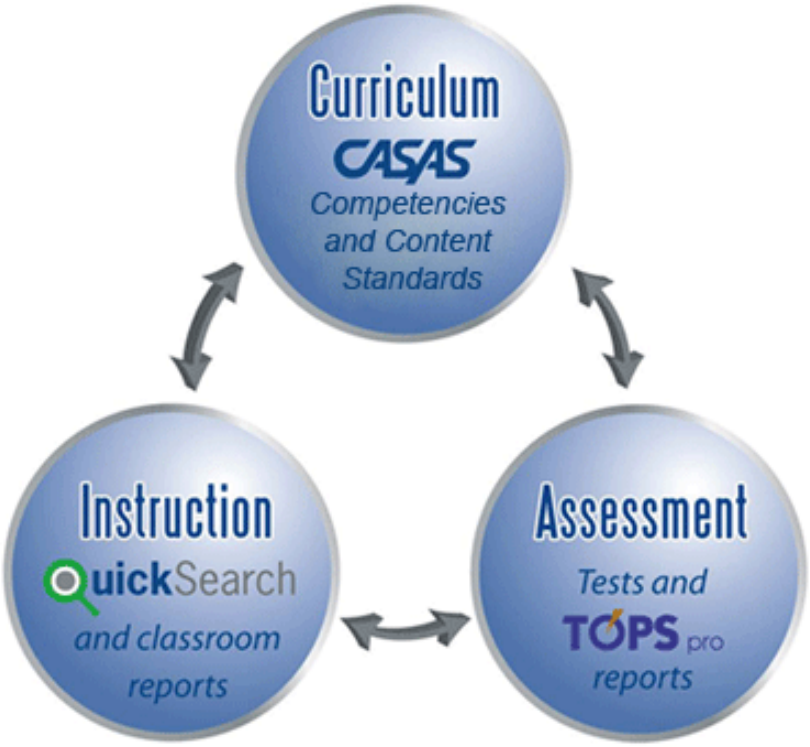


Table e1-1 Comparison of NRS Educational Functioning Level Descriptors and CASAS Level Descriptors for Reading – Adult Basic Education (ABE)

NRS Literacy Level	Basic Reading and writing (NRS)	Functional and Workplace Skills (NRS)	CASAS
Beginning ABE Literacy	Individual has no or minimal reading and writing skills. May have little or no comprehension of how print corresponds to spoken language and may have difficulty using a writing instrument. At the upper range of this level, individual can recognize, read, and write letters and numbers but has a limited understanding of connected prose and may need sight words and familiar words and phrases: may also be able to write simple sentences or phrases, including very simple messages. Can write basic personal information. Narrative writing is disorganized and unclear, inconsistently uses simple punctuation (e.g., periods, commas, question marks), and contains frequent errors in spelling.	Individual has little or no ability to read basic signs or maps and can provide limited personal information on simple forms. The individual can handle routine entry level jobs that require little or no basic written communication or computational skills and no knowledge of computers or other technology.	**Beginning Literacy/Pre-Beginning** Very limited ability to read or write. Persons at the upper end of this score range can read and write numbers and letters and simple words and phrases related to immediate needs. Can provide very basic personal identification in written form such as on job applications. Can handle routine entry-level jobs that require only basic written communication. **Employability**: Can handle routine entry-level jobs that involve only the most basic oral and written communication and in which tasks can be demonstrated and/or clarified orally.
Beginning Basic Education	Individual can read simple material on familiar subjects and comprehend simple and compound sentences in single or linked paragraphs containing a familiar vocabulary: can write simple notes and messages on familiar situations but lacks clarity and focus. Sentence structure lacks variety, but individual shows some control of basic grammar (e.g., present and past tense) and consistent use of punctuation (e.g., periods, capitalization).	Individual is able to read simple directions, signs, and maps, fill out simple forms requiring basic personal information, write phone messages, and make simple changes. There is minimal knowledge of and experience with using computers and related technology. The individual can handle basic entry level jobs that require minimal literacy skills; can recognize very short, explicit, pictorial texts (e.g., understands logos related to worker safety before using a piece of machinery); and can read want ads and complete simple job applications	**Beginning Basic Skills** **Reading/Writing:** Can read and interpret simple material on familiar topics. Can read and interpret simple directions, signs, maps, and simple menus. Can fill out simple forms requiring basic personal information; write a simple list or telephone message based on familiar situations. Can read and interpret simple sentences on familiar topics. **Employability**: Can handle entry-level jobs that involve some simple oral and written communication but in which tasks can also be demonstrated and/or clarified orally.

Table e1-1 Comparison of NRS Educational Functioning Level Descriptors and CASAS Level Descriptors for Reading – Adult Basic Education (ABE) (cont.)

NRS Literacy Level	Basic Reading and Writing (NRS)	Functional and Workplace Skills (NRS)	CASAS
Low Intermediate Basic Education	Individual can read text on familiar subjects that have a simple and clear underlying structure (e.g., clear main idea, chronological order); can use context to determine meaning; can interpret actions required in specific written directions; and write simple paragraphs with a main idea and supporting details on familiar topics (e.g., daily activities, personal issues) by recombining learned vocabulary and structures; and can self and peer edit for spelling and punctuation errors.	Individual is able to handle basic reading, writing, and computational tasks related to life roles, such as completing medical forms, order forms, or job applications; and can read simple charts, graphs, labels, and payroll stubs and simple authentic material if familiar with the topic. The individual can use simple computer programs and perform a sequence of routine tasks given direction using technology (e.g., fax machine, computer operation). The individual can qualify for entry-level jobs that require following basic written instructions and diagrams with assistance, such as oral clarification; can write a short report or message to fellow workers; and can read simple dials and scales and take routine measurements.	**Intermediate Basic Skills** **Reading/Writing:** Can handle basic reading and writing tasks related to life roles. Can read and interpret simplified and some authentic materials on familiar topics, follow basic written instructions and diagrams; can fill out basic medical information forms and basic job applications; follow basic oral and written instructions and diagrams. Can write messages or notes related to basic needs. **Employability**: Can handle jobs and/or training that involve following basic oral and written instructions and diagrams if they can be clarified orally.
High Intermediate Basic Education	Individual is able to read simple descriptions and narratives on familiar subjects or from which new vocabulary can be determined by context and can make some minimal inferences about familiar texts and compare and contrast information from such texts but not consistently. The individual can write simple narrative descriptions and short essays on familiar topics and has consistent use of basic punctuation but makes grammatical errors with complex structures.	Individual is able to handle basic life skills tasks such as graphs, charts, and labels and can follow multistep diagrams; can read authentic materials on familiar topics, such as simple employee handbooks and payroll stubs; can complete forms such as a job application and reconcile a bank statement. Can handle jobs that involve following simple written instructions and diagrams; can read procedural texts, where the information is supported by diagrams, to remedy a problem, such as locating a problem with a machine or carrying out repairs using a repair manual. The individual can learn or work with most basic computer software, such as using a word processor to produce own texts, and can follow simple instructions for using technology.	**Advanced Basic Skills** **Reading/Writing**: Can handle most routine reading and writing tasks related to their life roles; can fill out routine medical information forms and job applications. Can follow multi-step diagrams and written instructions; and write a simple accident or incident report. Can handle jobs and job training situations that involve following oral and simple written instructions and diagrams. Persons at the upper end of this score range are able to begin GED preparation. **Employability**: Can handle jobs and job training situations that involve following oral and simple written instructions and multi-step diagrams and limited public contact. Can read a simple employee handbook and make simple log entries

Table e1-2 Comparison of NRS Educational Functioning Level Descriptors and CASAS Level Descriptors for Reading – Adult Secondary Education (ASE)

NRS Literacy Level	Basic Reading and writing (NRS)	Functional and Workplace Skills (NRS)	CASAS
Low Adult Secondary Education	Individual can comprehend expository writing and identify spelling, punctuation, and grammatical errors; can comprehend a variety of materials such as periodicals and nontechnical journals on common topics; can comprehend library reference materials and compose multiparagraph essays; can listen to oral instructions and write an accurate synthesis of them; and can identify the main idea in reading selections and use a variety of context issues to determine meaning. Writing is organized and cohesive with few mechanical errors; can write using a complex sentence structure; and can write personal notes and letters that accurately reflect thoughts.	Individual is able or can learn to follow simple multistep directions and read common legal forms and manuals; can integrate information from texts, charts, and graphs; can create and use tables and graphs; can complete forms and applications and complete resumes; can perform jobs that require interpreting information from various sources and writing or explaining tasks to other workers; is proficient using computers and can use most common computer applications; can understand the impact of using different technologies; and can interpret the appropriate use of new software and technology.	**Adult Secondary** **Reading/Writing**: Can read and follow multi-step directions; read and interpret common legal forms and manuals; communicate personal opinion in written form; write an accident or incident report. Can integrate information from multiple texts, charts, and graphs as well as evaluate and organize information. Can perform tasks that involve oral and written instructions in both familiar and unfamiliar situations. Can fill out medical information forms and job applications. Can read and interpret non-simplified materials on everyday subjects; can interpret routine charts, graphs, and labels; **Employability**: Understands routine work-related conversations. Can handle work that involves following oral and simple written instructions and interact with the public. Can perform reading and writing tasks, such as most logs, reports, and forms, with reasonable accuracy to meet work needs.
High Adult Secondary Education	Individual can comprehend, explain, and analyze information from a variety of literacy works, including primary source materials and professional journals, and can use context cues and higher order processes to interpret meaning of written material. Writing is cohesive with clearly expressed ideas supported by relevant detail, and individual can use varied and complex sentence structures with few mechanical errors.	Individual is able to read technical information and complex manuals; can comprehend some college level books and apprenticeship manuals; can function in most job situations involving higher order thinking; can read text and explain a procedure about a complex and unfamiliar work procedure, such as operating a complex piece of machinery; can evaluate new work situations and processes; and can work productively and collaboratively in groups and serve as facilitator and reporter of group work. The individual is able to use common software and learn new software applications; can define the purpose of new technology and software and select appropriate technology; can adapt use of software or technology to new situations; and can instruct others, in written or oral form, on software and technology use.	**Advanced Adult Secondary** **Reading/Writing**: Can handle most reading and writing tasks related to life roles; can read and interpret most non-simplified materials; can interpret charts, graphs, and labels. With some assistance, persons at this level are able to interpret technical information, more complex manuals, and material safety data sheets (MSDS). Can comprehend some college textbooks and apprenticeship manuals. **Employability**: Can meet work demands with confidence, interact with the public, and follow written instructions in work manuals.

Table e1-3 Comparison of NRS Educational Functioning Level Descriptors and CASAS Level Descriptors for Reading– ESL

NRS Literacy Level	Basic Reading and Writing (NRS)	Functional and Workplace Skills (NRS)	CASAS
Beginning ESL Literacy	Individual has no or minimal reading or writing skills in any language. May have little or no comprehension of how print corresponds to spoken language and may have difficulty using a writing instrument.	Individual functions minimally or not at all in English and can communicate only through gestures or a few isolated words, such as name and other personal information; may recognize only common signs or symbols (e.g., stop sign, product logos); can handle only very routine entry-level jobs that do not require oral or written communication in English. There is no knowledge or use of computers or technology.	Reading/Writing: May not be literate in any language. Employability: Can handle very routine entry-level jobs that do not require oral or written communication in English and in which all tasks are easily demonstrated. Employment choices would be extremely limited.
Low Beginning ESL	Individual can read numbers and letters and some common sight words. May be able to sound out simple words. Can read and write some familiar words and phrases, but has a limited understanding of connected prose in English. Can write basic personal information (e.g., name, address, telephone number) and can complete simple forms that elicit this information.	Individual functions with difficulty in social situations and in situations related to immediate needs. Can provide limited personal information on simple forms, and can read very simple common forms of print found in the home and environment, such as product names. Can handle routine entry level jobs that require very simple written or oral English communication and in which job tasks can be demonstrated. May have limited knowledge and experience with computers.	Reading/Writing: Recognizes and writes letters and numbers and reads and understands common sight words. Can write own name and address. Employability: Can handle only routine entry-level jobs that do not require oral or written communication in English and in which all tasks are easily demonstrated.
High Beginning ESL	Individual can read most sight words, and many other common words. Can read familiar phrases and simple sentences but has a limited understanding of connected prose and may need frequent re-reading. Individual can write some simple sentences with limited vocabulary. Meaning may be unclear. Writing shows very little control of basic grammar, capitalization and punctuation and has many spelling errors.	Individual can function in some situations related to immediate needs and in familiar social situations. Can provide basic personal information on simple forms and recognizes simple common forms of print found in the home, workplace and community. Can handle routine entry level jobs requiring basic written or oral English communication and in which job tasks can be demonstrated. May have limited knowledge or experience using computers.	Reading/Writing: Reads and writes letters and numbers and a limited number of basic sight words and simple phrases related to immediate needs. Can write basic personal information on simplified forms. Employability: Can handle routine entry-level jobs that involve only the most basic oral or written communication in English and in which all tasks can be demonstrated.

Table e1-3 Comparison of NRS Educational Functioning Level Descriptors and CASAS Level Descriptors for Reading– ESL (cont.)

NRS Literacy Level	Basic Reading and Writing (NRS)	Functional and Workplace Skills (NRS)	CASAS
Low Intermediate ESL	Individual can read simple material on familiar subjects and comprehend simple and compound sentences in single or linked paragraphs containing a familiar vocabulary; can write simple notes and messages on familiar situations but lacks clarity and focus. Sentence structure lacks variety but shows some control of basic grammar (e.g., present and past tense) and consistent use of punctuation (e.g., periods, capitalization).	Individual can interpret simple directions and schedules, signs, and maps; can fill out simple forms but needs support on some documents that are not simplified; and can handle routine entry level jobs that involve some written or oral English communication but in which job tasks can be demonstrated. Individual can use simple computer programs and can perform a sequence of routine tasks given directions using technology (e.g., fax machine, computer).	Reading/Writing: Can read and interpret simple material on familiar topics. Able to read and interpret simple directions, schedules, signs, maps, and menus. Can fill out forms requiring basic personal information and write short, simple notes and messages based on familiar situations. Employability: Can handle entry-level jobs that involve some simple oral and written communication but in which tasks can also be demonstrated and/or clarified orally.
High Intermediate ESL	Individual can read text on familiar subjects that have a simple and clear underlying structure (e.g., clear main idea, chronological order); can use context to determine meaning; can interpret actions required in specific written directions; can write simple paragraphs with main idea and supporting details on familiar topics (e.g., daily activities, personal issues) by recombining learned vocabulary and structures; and can self and peer edit for spelling and punctuation errors.	Individual can meet basic survival and social needs, can follow some simple oral and written instruction, and has some ability to communicate on the telephone on familiar subjects; can write messages and notes related to basic needs; can complete basic medical forms and job applications; and can handle jobs that involve basic oral instructions and written communication in tasks that can be clarified orally. Individual can work with or learn basic computer software, such as word processing, and can follow simple instructions for using technology.	Reading/Writing: Can read and interpret simplified and some authentic material on familiar subjects. Can write messages or notes related to basic needs. Can fill out basic medical forms and job applications. Employability: Can handle jobs and/or training that involve following basic oral and written instructions and diagrams if they can be clarified orally.
Advanced ESL	Individual can read moderately complex text related to life roles and descriptions and narratives from authentic materials on familiar subjects. Uses context and word analysis skills to understand vocabulary, and uses multiple strategies to understand unfamiliar texts. Can make inferences, predictions, and compare and contrast information in familiar texts. Individual can write multi-paragraph text (e.g., organizes and develops ideas with clear introduction, body, and conclusion), using some complex grammar and a variety of sentence structures. Makes some grammar and spelling errors. Uses a range of vocabulary.	Individual can function independently to meet most survival needs and to use English in routine social and work situations. Can communicate on the telephone on familiar subjects. Understands radio and television on familiar topics. Can interpret routine charts, tables and graphs and can complete forms and handle work demands that require non-technical oral and written instructions and routine interaction with the public. Individual can use common software, learn new basic applications, and select the correct basic technology in familiar situations.	Reading/Writing: Can read and interpret simplified and some non-simplified materials on familiar topics. Can interpret simple charts, graphs, and labels; interpret a payroll stub; and complete a simple order form; fill out medical information forms and job applications. Can write short personal notes and letters and make simple log entries. Employability: Can handle jobs and job training situations that involve following oral and simple written instructions and multi-step diagrams and limited public contact. Can read a simple employee handbook. Persons at the upper end of this score range are able to begin GED preparation

Table e1-4 Reading Basic Skills Content Standards by Test Item for CASAS ECS Reading Assessments

		TEST FORMS▶																									
		ESL							ABE				ASE														
	NRS LEVEL▶	1	2	3	4	5	6		1	2	3	4	5	6													
	CASAS LEVEL▶	A	A	A	B	B	C	D	A	B	B	C	D	E													
	Content Standards▼														ECS FORM 11	ECS FORM 12	ECS FORM 13	ECS FORM 14	ECS FORM 114	WLS FORM 213	WLS FORM 214	ECS FORM 15	ECS FORM 16	ECS FORM 116	WLS FORM 215	WLS FORM 216	ECS FORM 17	ECS FORM 18
R1	**Beginning literacy / phonics**																										
R1.1	Identify the letters of the English alphabet (upper and lower case)	●	●						●						25	25											
R1.2	Recognize that letters make words and words make sentences	●							●						25	25											
R1.3	Read from left to right, top to bottom, front to back	●							●						25	25											
R1.4	Relate letters to sounds	●	●						●						25	25											
R1.5	Relate letters to a range of possible pronunciations, including recognizing common homonyms	●	●	●	●				●	●					25	25	34	34	34	34	34						
R1.6	Use common phonological patterns to sound out unfamiliar words (e.g., man/van)	●	●	●					●						24	25											
R2	**Vocabulary**																										
R2.1	Interpret common symbols (e.g., restroom signs, traffic signs; #, ►, ↑)	●	●						●						4	1				5	5						
R2.2	Read basic sight words (e.g., the, is)	●							●						25	25	34	34									
R2.3	Interpret common high-frequency words and phrases in everyday contexts (e.g., signs, ads, labels)	●							●						4	25	13	14		34	34						
R2.4	Use capitalization as a clue to interpret words (e.g., names, place names, other proper nouns)														8	25											
R2.5	Interpret contractions		●	●	●				●	●					3	1				4	2						
R2.6	Interpret basic abbreviations (e.g., Mr., apt., lb.)		●	●	●				●	●					6	6	1		6	7	3						
R2.7	Interpret abbreviations in specialized				●	●				●	●									3	2						

		TEST FORMS▶																											
		ESL							ABE				ASE																
	NRS LEVEL▶	1	2	3	4	5	6		1	2	3	4	5	6															
	CASAS LEVEL▶	A	A	A	B	B	C	D	A	B	B	C	D	E															
	Content Standards▼														ECS FORM 11	ECS FORM 12	ECS FORM 13	ECS FORM 14	ECS FORM 114	WLS FORM 213	WLS FORM 214	ECS FORM 15	ECS FORM 16	ECS FORM 116	WLS FORM 215	WLS FORM 216	ECS FORM 17	ECS FORM 18
	contexts (e.g., tsp., bnfts.)																												
R2.8	Interpret meaning from word formations (e.g., verb endings, plurals, possessives, comparative forms)		●	●	●	●			●	●	●				4	8	1	1	13	11									
R2.9	Interpret common prefixes and suffixes to determine the meaning of words (e.g., un-happy, work-er)			●	●	●			●	●	●				1					3									
R2.10	Interpret less common prefixes and suffixes to determine the meaning of words (e.g., impossible, anti-war, employee)					●	●				●	●									2	10	17	2	1	3			
R2.11	Interpret familiar words used in a new context (e.g., enter a room, enter data on a computer)				●					●							5		4		2								
R2.12	Interpret specialized vocabulary in context (e.g., consumer, work, field of interest)						●	●				●	●	●								19	12	11	22	20	17	20	
R3	**General reading comprehension**																												
R3.1	Interpret common punctuation and sentence-writing conventions (e.g., capitalized first word)	●	●	●					●						25	25	34	34											
R3.2	Read and understand simple sentences that contain familiar vocabulary		●	●	●				●	●					25	25	34	34		34	34								
R3.3	Read and understand simple texts on familiar topics (e.g., short narratives, basic consumer materials)			●	●				●	●					2		3	2		6	4								
R3.4	Read and understand moderately complex texts (e.g., general informational materials, common workplace materials)				●	●				●	●						7	14		2	2								
R3.5	Read and understand complex texts (e.g., newspaper and magazine articles, technical materials, literature)						●	●				●	●	●								6			3	4			
R3.6	Interpret simple written instructions		●	●	●				●	●					2	10	5	5	4	3	1								

		TEST FORMS▶																									
		ESL							ABE				ASE														
	NRS LEVEL▶	1	2	3	4	5	6		1	2	3	4	5	6													
	CASAS LEVEL▶	A	A	A	B	B	C	D	A	B	B	C	D	E													
	Content Standards▼														ECS FORM 11	ECS FORM 12	ECS FORM 13	ECS FORM 14	ECS FORM 114	WLS FORM 213	WLS FORM 214	ECS FORM 15	ECS FORM 16	ECS FORM 116	WLS FORM 215	WLS FORM 216	ECS FORM 17	ECS FORM 18
R3.7	Interpret detailed instructions (e.g., workplace procedures, operating instructions, consumer materials)					●	●	●			●	●	●	●					4	5	6		9	10	21	20	20	19
R3.8	Interpret basic sentence structure and grammar (e.g., statements, questions, negatives; adjectives modifying nouns)		●	●	●				●	●					25	25	32	34	34	34	34							
R3.9	Interpret complex sentence structure and grammar (e.g., relative clauses, perfect tenses)					●	●	●			●	●	●	●			7	2	4	6	6	4			2	2	9	4
R3.10	Follow pronoun references within a text (e.g., Ms. Smith… she; This is important.)		●	●	●				●	●							5	5	5	5	4							
R3.11	Make connections between related information across different sections of a text					●	●	●			●	●	●	●						2	2	5	5	1			3	8
R3.12	Use supporting illustrations to interpret text	●	●	●					●						7													
R3.13	Use contextual clues to determine the meaning of words and phrases (e.g., Save $10 on your next purchase.)				●	●			●	●	●						6		2									
R3.14	Interpret signal words as clues to the organization and content of a text (e.g., first… then; however; it's important that…)			●	●	●	●	●	●	●	●	●	●	●			1		4	7	6	5	8	3	2	2	9	2
R3.15	Interpret idioms and collocations from context				●	●	●	●		●	●						1		1									
R3.16	Interpret figurative meanings of words from context (e.g., flooded with calls)						●	●				●	●	●														
R3.17	Interpret the connotative meaning of a word (e.g., inexpensive vs. cheap)					●	●				●	●																
R3.18	Interpret analogies in familiar contexts						●	●				●	●	●														
R3.19	Interpret meaning of metaphors and similes in context							●					●	●														

		TEST FORMS▶												ECS FORM 11	ECS FORM 12	ECS FORM 13	ECS FORM 14	ECS FORM 114	WLS FORM 213	WLS FORM 214	ECS FORM 15	ECS FORM 16	ECS FORM 116	WLS FORM 215	WLS FORM 216	ECS FORM 17	ECS FORM 18
		ESL							ABE				ASE															
	NRS LEVEL▶	1	2	3	4	5	6		1	2	3	4	5	6														
	CASAS LEVEL▶	A	A	A	B	B	C	D	A	B	B	C	D	E														
	Content Standards▼																											
R4	**Text in format**																											
R4.1	Read numbers	●	●						●						20	13												
R4.2	Read clock times	●							●						4	5												
R4.3	Read dates	●	●	●					●							2												
R4.4	Read money amounts	●	●						●						3	1												
R4.5	Read simple handwriting		●	●	●				●	●					1	1		15	3	2	4							
R4.6	Interpret simple forms (e.g., appointment sign-in sheet, class registration)		●	●	●	●			●	●	●						4	4	4	5	9	15						
R4.7	Interpret complex forms (e.g., rental, insurance, pay statements)					●	●	●			●	●	●	●						2	4	6	2		3	2		
R4.8	Interpret information in charts and tables (e.g., bus schedules)		●	●	●				●	●					9					7	8							
R4.9	Interpret maps, diagrams, and graphs			●	●	●	●	●	●	●	●	●	●	●	2	2	3	9	4	2	2	3	1	2	5	3	6	6
R4.10	Interpret written materials using formatting clues (e.g., headings, captions, bullets, print features such as bold)		●	●	●	●	●		●	●	●	●			14	12	19	29	34	24	20	34	38	38	20	19		
R5	**Reference materials**															2												
R5.1	Find a word or number in an alphabetical, numeric, or other ordered listing (e.g., telephone directory, list of part numbers)		●	●					●																			
R5.2	Locate information using an index or table of contents (e.g., of a book, manual, computer application help feature)				●	●	●			●	●	●					2			1	1	3	4	2				
R5.3	Locate information organized in groups or categories (e.g., in a department directory, catalog, on a web page)			●	●	●	●		●	●	●	●										2		8	1	1		
R5.4	Use a picture dictionary	●	●						●																			

		TEST FORMS▶																										
		ESL							ABE				ASE															
	NRS LEVEL▶	1	2	3	4	5	6		1	2	3	4	5	6														
	CASAS LEVEL▶	A	A	A	B	B	C	D	A	B	B	C	D	E														
	Content Standards▼														ECS FORM 11	ECS FORM 12	ECS FORM 13	ECS FORM 14	ECS FORM 114	WLS FORM 213	WLS FORM 214	ECS FORM 15	ECS FORM 16	ECS FORM 116	WLS FORM 215	WLS FORM 216	ECS FORM 17	ECS FORM 18
R5.5	Use a simplified dictionary or glossary		●	●	●				●	●							2	3										
R5.6	Use a standard dictionary to distinguish between multiple meanings of a word					●	●	●			●	●	●	●														
R5.7	Use reference tools such as a print or online encyclopedia							●					●	●														
R6	**Reading strategies**																											
R6.1	Predict the content of a text from title, pictures, type of material		●	●	●	●			●	●	●				25	25	34	34	34	15	11							
R6.2	Scan simple text (e.g., ads, schedules, forms, paragraphs) to find specific information		●	●	●	●			●	●	●					4	12	31	34	25	27							
R6.3	Scan complex or extended text (e.g., web pages, documents, narratives) to find specific information					●	●	●			●	●	●	●			10	3		2	2	12	16	13			14	24
R6.4	Skim simple text for general meaning				●	●				●	●										1							
R6.5	Skim complex text for general meaning or to determine subject matter or organization					●	●	●			●	●	●	●														
R6.6	Use appropriate reading strategy (e.g., skimming, scanning, predicting, inferring) to understand content of unfamiliar material or specialized information				●	●	●	●		●	●	●	●	●			3		2	23	25	26	23	21	36	30	30	24
R6.7	Increase reading fluency (accuracy, speed)				●	●	●	●	●	●	●	●	●	●														
R7	**Reading and thinking skills**																											
R7.1	Identify the main idea of a simple paragraph			●					●																			
R7.2	Identify the main idea of a multi-paragraph text				●	●	●	●		●	●	●	●	●					1						2	2	1	
R7.3	Identify supporting points or details for a statement, position or argument on a familiar topic						●	●				●	●	●								7		12			8	

		TEST FORMS▶																										
		ESL							ABE				ASE															
	NRS LEVEL▶	1	2	3	4	5	6		1	2	3	4	5	6														
	CASAS LEVEL▶	A	A	A	B	B	C	D	A	B	B	C	D	E														
	Content Standards▼														ECS FORM 11	ECS FORM 12	ECS FORM 13	ECS FORM 14	ECS FORM 114	WLS FORM 213	WLS FORM 214	ECS FORM 15	ECS FORM 16	ECS FORM 116	WLS FORM 215	WLS FORM 216	ECS FORM 17	ECS FORM 18
R7.4	Determine the sequence of events in a simple narrative		●	●	●				●	●										1	1						1	
R7.5	Determine the sequence of events in a complex narrative					●	●	●			●	●	●	●						1	1							
R7.6	Paraphrase information					●	●	●			●	●	●	●			2			5	1	6	8	4	10	8	2	1
R7.7	Summarize a text					●	●	●			●	●	●	●									1		1		1	4
R7.8	Make inferences and draw conclusions from simple text			●	●	●			●	●	●						2		1	3								
R7.9	Make inferences and draw conclusions from complex text						●	●				●	●	●								9					14	9
R7.10	Differentiate fact from opinion in a written text					●	●				●	●																
R7.11	Identify the writer, audience, and purpose of a text						●	●				●	●	●														
R7.12	Determine a writer's point of view							●					●	●														
R7.13	Compare related information from various sources (e.g., consumer ads)			●	●	●	●	●	●	●	●	●	●	●														
R7.14	Verify and clarify facts in written information (e.g., advertising claims)						●	●				●	●	●														

Table e1-5 ECS Reading Form 11 Competencies

Item	Comp.	The learner will demonstrate the ability to:
1.	2.3.1-5	Interpret clock time
2.	1.1.5-5	Interpret temperatures
3.	2.2.2-4	Recognize and use signs related to transportation
4.	4.1.2-1	Follow procedures for applying for a job, including interpreting and completing job applications, résumés, and letters of application
5.	1.1.6-4	Count, convert, and use coins and currency, and recognize symbols such as ($) and (.)
6.	7.4.6-2	Use indexes and tables of contents
7.	7.4.6-2	"
8.	4.2.1-2	Interpret wages, wage deductions, benefits, and timekeeping forms
9.	4.2.1-2	"
10.	2.5.4-4	Read, interpret, and follow directions found on public signs and building directories
11.	2.5.4-4	"
12.	2.2.1-2	Ask for, give, follow, or clarify directions
13.	2.2.1-2	"
14.	2.3.2-2	Identify the months of the year and the days of the week
15.	4.2.1-2	Interpret wages, wage deductions, benefits, and timekeeping forms
16.	4.2.1-2	"
17.	4.1.2-1	Follow procedures for applying for a job, including interpreting and completing job applications, résumés, and letters of application
18.	4.1.3-4	Identify and use sources of information about job opportunities such as job descriptions, job ads, and announcements, and about the workforce and job market
19.	4.1.3-4	"
20.	4.1.6-3	Interpret general work-related vocabulary
21.	4.1.6-3	"
22.	2.2.4-2	Interpret transportation schedules and fares
23.	2.2.4-2	"
24.	3.4.1-3	Interpret product label directions and safety warnings
25.	3.4.1-3	"

Table e1-6 ECS Reading Form 12 Competencies

Item	Comp.	The learner will demonstrate the ability to:
1.	2.3.1-5	Interpret clock time
2.	2.2.2-4	Recognize and use signs related to transportation
3.	2.2.4-4	Interpret transportation schedules and fares
4.	2.5.4-4	Read, interpret, and follow directions found on public signs and building directories
5.	2.1.1-4	Use the telephone directory and related publications to locate information
6.	7.4.6-2	Use indexes and tables of contents
7.	7.4.6-2	"
8.	1.8.2-1	Interpret the procedures and forms associated with banking services, including writing checks
9.	2.5.4-4	Read, interpret, and follow directions found on signs and directories
10.	4.2.1-2	Interpret wages, wage deductions, benefits, and timekeeping forms
11.	4.2.1-2	"
12.	3.3.1-3	Identify and use necessary medications
13.	2.3.2-2	Identify the months of the year and the days of the week
14.	2.5.4-4	Read, interpret, and follow directions found on public signs and building directories
15.	2.2.1-2	Ask for, give, follow, or clarify directions
16.	2.2.1-2	"
17.	4.1.3-4	Identify and use sources of information about job opportunities such as job descriptions, job ads, and announcements, and about the workforce and job market
18.	4.1.3-4	"
19.	4.1.2-1	Follow procedures for applying for a job, including interpreting and completing job applications, résumés, and letters of application
20.	3.4.1-3	Interpret product label directions and safety warnings
21.	3.4.1-3	"
22.	4.3.1-4	Interpret safety signs found in the workplace
23.	4.3.1-4	"
24.	4.3.3-3	Identify safe work procedures and common safety equipment, including wearing safe work attire
25.	4.3.3-3	"

Table e1-7 ECS Reading Form 13 Competencies

Item	Comp.	The learner will demonstrate the ability to:
1.	4.3.1-4	Interpret safety signs found in the workplace
2.	4.3.1-4	"
3.	4.1.3-4	Identify and use sources of information about job opportunities such as job descriptions, job ads, and announcements, and about the workforce and job market
4.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
5.	4.4.3-2	"
6.	4.4.3-2	"
7.	4.1.2-1	Follow procedures for applying for a job, including interpreting and completing job applications, résumés, and letters of application
8.	4.1.2-1	"
9.	7.4.5-2	Use reference materials, such as dictionaries and encyclopedias
10.	7.4.5-2	"
11.	2.5.5-1	Locate and use educational services in the community, including interpreting and writing school-related communications
12.	2.5.5-1	"
13.	4.3.1-4	Interpret safety signs found in the workplace
14.	4.3.1-4	"
15.	4.1.3-3	Identify and use sources of information about job opportunities such as job descriptions, job ads, and announcements, and about the workforce and job market
16.	4.1.3-3	"
17.	4.2.3-3	Interpret employment contracts and union agreements
18.	4.2.3-3	"
19.	4.3.2-3	Interpret work safety manuals and related information
20.	4.3.2-3	"
21.	4.3.2-3	"
22.	4.3.4-3	Report unsafe working conditions and work-related accidents, injuries, and damages
23.	4.3.4-3	"
24.	4.3.4-3	"
25.	4.1.3-4	Identify and use sources of information about job opportunities such as job descriptions, job ads, and announcements, and about the workforce and job market
26.	4.1.3-4	"
27.	4.1.3-4	"
28.	4.2.4-2	Interpret employee handbooks, personnel policies, and job manuals
29.	4.2.4-2	"
30.	4.2.4-3	"
31.	4.1.2-3	Follow procedures for applying for a job, including interpreting and completing job applications, résumés, and letters of application
32.	4.1.2-3	"
33.	3.4.3-3	Interpret procedures for simple first aid
34.	3.4.3-3	"

Table e1-8 ECS Reading Form 14 Competencies

Item	Comp.u	The learner will demonstrate the ability to:
1.	3.4.1-3	Interpret product label directions and safety warnings
2.	4.2.1-2	Interpret wages, wage deductions, benefits, and timekeeping forms
3.	4.2.1-2	"
4.	4.3.1-4	Interpret safety signs found in the workplace
5.	4.3.1-4	"
6.	4.1.5-3	Identify procedures involved in interviewing for a job, such as arranging for an interview, acting and dressing appropriately, and selecting appropriate questions and responses
7.	4.1.5-3	"
8.	4.1.5-3	"
9.	4.3.3-3	Identify safe work procedures and common safety equipment, including wearing safe work attire
10.	4.3.3-3	"
11.	4.3.3-3	"
12.	4.4.3-4	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
13.	3.4.1-3	Interpret product label directions and safety warnings
14.	3.4.1-3	"
15.	3.4.1-3	"
16.	3.4.3-3	Interpret procedures for simple first aid
17.	3.4.3-3	"
18.	7.4.5-2	Use reference materials, such as dictionaries and encyclopedias
19.	7.4.5-2	"
20.	7.4.5-2	"
21.	4.1.6-3	Interpret general work-related vocabulary
22.	4.1.6-3	"
23.	2.5.5-3	Locate and use educational services in the community, including interpreting and writing school-related communications
24.	2.5.5-3	"
25.	4.2.3-3	Interpret employment contracts and union agreements
26.	4.2.3-3	"
27.	4.1.2-1	Follow procedures for applying for a job, including interpreting and completing job applications, résumés, and letters of application
28.	4.1.2-1	"
29.	4.1.2-1	"
30.	4.1.2-1	"
31.	4.1.3-3	Identify and use sources of information about job opportunities such as job descriptions, job ads, and announcements, and about the workforce and job market
32.	4.1.3-3	"
33.	4.1.4-3	Identify and use information about training opportunities
34.	4.1.4-3	"

Table e1-9 ECS Reading Form 114 Competencies

Item	Competency	Learner will demonstrate the ability to:
1.	4.1.3-4	Identify and use sources of information about job opportunities such as job descriptions, job ads, and announcements, and about the workforce and job market
2.	4.1.3-4	"
3.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
4.	4.4.3-2	"
5.	4.1.2-2	Follow procedures for applying for a job, including interpreting and completing job applications, résumés, and letters of application
6.	4.1.2-2	"
7.	4.3.4-1	Report unsafe working conditions and work- related accidents, injuries, and damages
8.	4.3.4-1	"
9.	4.3.4-1	"
10.	3.4.1-3	Interpret product label directions and safety warnings
11.	3.4.1-3	"
12.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
13.	4.4.3-2	"
14.	2.1.7-1	Take and interpret telephone messages, leave messages on answering machines, and interpret recorded messages
15.	2.1.7-1	"
16.	2.1.7-1	"
17.	4.4.4-2	Interpret job responsibilities and performance reviews
18.	4.4.4-2	"
19.	4.6.2-1	Interpret and write work-related correspondence, including notes, memos, and letters
20.	4.6.2-1	"
21.	2.5.5-1	Locate and use educational services in the community, including interpreting and writing school-related communications
22.	2.5.5-1	"
23.	2.5.5-1	"
24.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, and letters
25.	4.6.2-3	"
26.	4.6.2-3	"
27.	4.3.3-4	Identify safe work procedures and common safety equipment, including wearing safe work attire
28.	4.3.3-4	"
29.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, and letters
30.	4.6.2-3	"
31.	4.5.7-2	Demonstrate ability to identify and resolve problems with machines and to follow proper maintenance procedures
32.	4.5.7-2	"
33.	3.4.2-3	Identify safety measures that can prevent accidents and injuries
34.	3.4.2-3	"

Table e1-10 ECS Reading Form 213 Competencies

Item	Competency	The learner will demonstrate the ability to:
1.	0.2.1-4	Respond appropriately to common personal information questions
	1.1.4	Select, compute, or interpret appropriate standard measurement for length, width, perimeter, area, volume, height, or weight
	1.9.2	Identify driving regulations and procedures to obtain a driver's license
2.	4.2.1-2	Interpret wages, wage deductions, benefits, and timekeeping forms
3.	4.2.1-2	Interpret wages, wage deductions, benefits, and timekeeping forms
4.	4.3.1-4	Interpret safety signs found in the workplace
5.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	1.1.3	Interpret maps and graphs
	3.1.3	Identify and utilize appropriate health care services and facilities, including interacting with providers
6.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	7.2.1	Identify and paraphrase pertinent information
7.	3.2.3-1	Interpret information associated with medical, dental, or life insurance
	0.2.2	Complete a personal information form
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
8.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
9.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
10.	4.5.7-2	Demonstrate ability to identify and resolve problems with machines and to follow proper maintenance procedures
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
11.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	3.1.2	Identify information necessary to make or keep medical and dental appointments
	2.3.2	Identify the months of the year and the days of the week
12.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	1.1.3	Interpret maps and graphs
	2.3.2	Identify the months of the year and the days of the week
13.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.7.4	Identify, secure, evaluate, process, and/or store information needed to perform tasks or keep records
14.	4.6.2-1	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
15.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
16.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	2.3.1	Interpret clock time
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships
17.	2.1.7-1	Take and interpret telephone messages, leave messages on answering machines, and interpret recorded messages
	4.6.2	Interpret and write work-related correspondence, including notes, memos,

Item	Competency	The learner will demonstrate the ability to:
		letters, and e-mail
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	2.3.1	Interpret clock time
18.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
19.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
20.	4.3.4-1	Report unsafe working conditions and work-related accidents, injuries, and damages
	3.1.1	Describe symptoms of illness, including identifying parts of the body; interpret doctor's directions
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
21.	4.4.4-2	Interpret job responsibilities and performance reviews
22.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	4.3.4	Report unsafe working conditions and work-related accidents, injuries, and damages
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships
23.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	4.3.4	Report unsafe working conditions and work-related accidents, injuries, and damages
24.	4.2.1-2	Interpret wages, wage deductions, benefits, and timekeeping forms
	2.3.2	Identify the months of the year and the days of the week
25.	4.2.1-2	Interpret wages, wage deductions, benefits, and timekeeping forms
	1.1.6	Count, convert, and use coins and currency, and recognize symbols such as ($) and (.)
26.	4.3.3-4	Identify safe work procedures and common safety equipment, including wearing safe work attire
	3.4.1	Interpret product label directions and safety warnings
	3.4.2	Identify safety measures that can prevent accidents and injuries
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
27.	4.4.5-3	Identify job training needs and set learning goals
	4.4.1	Identify appropriate behavior, attire, attitudes, and social interaction, and other factors that affect job retention and advancement
28.	4.4.5-3	Identify job training needs and set learning goals
29.	3.4.1-4	Interpret product label directions and safety warnings
	4.3.3	Identify safe work procedures and common safety equipment, including wearing safe work attire
30.	3.4.1-4	Interpret product label directions and safety warnings
	4.3.3	Identify safe work procedures and common safety equipment, including wearing safe work attire
31.	4.5.7-3	Demonstrate ability to identify and resolve problems with machines and to follow proper maintenance procedures
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.

Item	Competency	The learner will demonstrate the ability to:
32.	4.5.7-3	Demonstrate ability to identify and resolve problems with machines and to follow proper maintenance procedures
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
33.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.5	Identify job training needs and set learning goals
34.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.5	Identify job training needs and set learning goals

Table e1-11 ECS Reading Form 214 Competencies

Item	Competency	The learner will demonstrate the ability to:
1.	4.4.3-4	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	0.2.1	Respond appropriately to common personal information questions
	2.3.2	Identify the months of the year and the days of the week
2.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	1.1.6	Count, convert, and use coins and currency, and recognize symbols such as ($) and (.)
3.	3.2.3-1	Interpret information associated with medical, dental, or life insurance
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
4.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	1.1.3	Interpret maps and graphs
	3.1.3	Identify and utilize appropriate health care services and facilities, including interacting with providers
5.	4.2.1-2	Interpret wages, wage deductions, benefits, and timekeeping forms
6.	4.3.1-4	Interpret safety signs found in the workplace
7.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	2.3.2	Identify the months of the year and the days of the week
	3.1.2	Identify information necessary to make or keep medical and dental appointments
8.	4.3.3-3	Identify safe work procedures and common safety equipment, including wearing safe work attire
	4.3.2	Interpret work safety manuals and related information
9.	4.3.4-1	Report unsafe working conditions and work-related accidents, injuries, and damages
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
10.	4.3.4-1	Report unsafe working conditions and work-related accidents, injuries, and damages
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	2.3.2	Identify the months of the year and the days of the week
11.	1.9.6-2	Interpret information related to automobile maintenance
	4.5.7	Demonstrate ability to identify and resolve problems with machines and to follow proper maintenance procedures
	4.3.2	Interpret work safety manuals and related information
12.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
13.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	4.3.3	Identify safe work procedures and common safety equipment, including wearing safe work attire
14.	4.4.4-2	Interpret job responsibilities and performance reviews
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
15.	2.1.7-1	Take and interpret telephone messages, leave messages on answering machines, and interpret recorded messages
	4.6.2	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and

Item	Competency	The learner will demonstrate the ability to:
		record information on forms, charts, checklists, etc.
	2.3.1	Interpret clock time
16.	2.1.7-1	Take and interpret telephone messages, leave messages on answering machines, and interpret recorded messages
	4.6.2	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	7.2.1	Identify and paraphrase pertinent information
17.	3.4.1-4	Interpret product label directions and safety warnings
	4.3.3	Identify safe work procedures and common safety equipment, including wearing safe work attire
18.	3.4.1-4	Interpret product label directions and safety warnings
	4.3.3	Identify safe work procedures and common safety equipment, including wearing safe work attire
19.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.1.8	Identify common occupations and the skills and education required for them
20.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	2.3.1	Interpret clock time
	2.3.2	Identify the months of the year and the days of the week
21.	4.6.2-1	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
22.	4.3.3-4	Identify safe work procedures and common safety equipment, including wearing safe work attire
	3.4.1	Interpret product label directions and safety warnings
	3.4.2	Identify safety measures that can prevent accidents and injuries
23.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.7.4	Identify, secure, evaluate, process, and/or store information needed to perform tasks or keep records
24.	4.2.1-2	Interpret wages, wage deductions, benefits, and timekeeping forms
	7.2.3	Make comparisons, differentiating among, sorting, and classifying items, information, or ideas
25.	4.2.1-2	Interpret wages, wage deductions, benefits, and timekeeping forms
	1.1.6	Count, convert, and use coins and currency, and recognize symbols such as ($) and (.)
26.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	1.1.3	Interpret maps and graphs
27.	4.4.5-3	Identify job training needs and set learning goals
	4.4.2	Identify appropriate skills and education for keeping a job and getting a promotion
28.	4.4.5-3	Identify job training needs and set learning goals
	7.2.1	Identify and paraphrase pertinent information
29.	4.5.7-3	Demonstrate ability to identify and resolve problems with machines and to follow proper maintenance procedures
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
30.	4.5.7-3	Demonstrate ability to identify and resolve problems with machines and to follow proper maintenance procedures
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and

Item	Competency	The learner will demonstrate the ability to:
		record information on forms, charts, checklists, etc.
31.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	7.2.1	Identify and paraphrase pertinent information
32.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	7.2.1	Identify and paraphrase pertinent information
33.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.5	Identify job training needs and set learning goals
34.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.5	Identify job training needs and set learning goals

Table e1-12 ECS Reading Form 15 Competencies

Item	Comp.	The learner will demonstrate the ability to:
1.	4.1.3-4	Identify and use sources of information about job opportunities such as job descriptions, job ads, and announcements, and about the workforce and job market
2.	4.1.3-4	"
3.	4.1.2-3	Follow procedures for applying for a job, including interpreting and completing job applications, résumés, and letters of application
4.	4.1.2-3	"
5.	4.1.2-3	"
6.	1.9.4-2	Interpret maps related to driving
7.	1.9.4-2	"
8.	4.2.3-3	Interpret employment contracts and union agreements
9.	4.2.3-3	"
10.	4.1.8-2	Identify common occupations and the skills and education required for them
11.	4.1.8-2	"
12.	4.1.8-2	"
13.	4.4.4-2	Interpret job responsibilities and performance reviews
14.	4.4.4-2	"
15.	4.1.5-3	Identify procedures involved in interviewing for a job, such as arranging for an interview, acting and dressing appropriately, and selecting appropriate questions and responses
16.	4.1.5-3	"
17.	4.1.4-3	Identify and use information about training opportunities
18.	4.1.4-3	"
19.	3.4.3-3	Interpret procedures for simple first aid
20.	3.4.3-3	"
21.	4.1.2-1	Follow procedures for applying for a job, including interpreting and completing job applications, résumés, and letters of application
22.	4.1.2-1	"
23.	3.1.1-2	Describe symptoms of illness, including identifying parts of the body; interpret doctor's directions
24.	3.1.1-2	"
25.	2.5.5-2	Locate and use educational services in the community, including interpreting and writing school-related communications
26.	2.5.5-2	"
27.	2.5.5-2	"
28.	4.1.3-3	Identify and use sources of information about job opportunities such as job descriptions, job ads, and announcements, and about the workforce and job market
29.	4.1.3-3	"
30.	4.1.2-1	Follow procedures for applying for a job, including interpreting and completing job applications, résumés, and letters of application
31.	4.1.2-1	"
32.	4.2.1-3	Interpret wages, wage deductions, benefits, and timekeeping forms
33.	4.2.1-3	"
34.	4.4.3-4	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
35.	4.4.3-4	"
36.	4.4.3-1	"
37.	4.1.8-3	Identify common occupations and the skills and education required for them
38.	4.1.8-3	"

Table e1-13 ECS Reading Form 16 Competencies

Item	Comp.	The learner will demonstrate the ability to:
1.	4.3.3-4	Identify safe work procedures and common safety equipment, including wearing safe work attire
2.	4.3.3-4	"
3.	4.1.3-3	Identify and use sources of information about job opportunities such as job descriptions, job ads, and announcements, and about the workforce and job market
4.	4.1.3-3	"
5.	4.1.2-3	Follow procedures for applying for a job, including interpreting and completing job applications, résumés, and letters of application
6.	4.1.2-3	"
7.	3.4.3-3	Interpret procedures for simple first aid
8.	3.4.3-3	"
9.	4.1.2-3	Follow procedures for applying for a job, including interpreting and completing job applications, résumés, and letters of application
10.	4.1.2-3	"
11.	4.2.4-2	Interpret employee handbooks, personnel policies, and job manuals
12.	4.2.4-2	"
13.	4.1.5-3	Identify procedures involved in interviewing for a job, such as arranging for an interview, acting and dressing appropriately, and selecting appropriate questions and responses
14.	4.1.5-3	"
15.	4.4.4-2	Interpret job responsibilities and performance reviews
16.	4.4.4-2	"
17.	5.4.1-1	Interpret income tax forms
18.	5.4.1-1	"
19.	5.4.1-1	"
20.	4.2.3-3	Interpret employment contracts and union agreements
21.	4.2.3-3	"
22.	4.4.3-4	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
23.	4.4.3-4	"
24.	4.1.4-3	Identify and use information about training opportunities
25.	4.1.4-3	"
26.	4.2.4-3	Interpret employee handbooks, personnel policies, and job manuals
27.	4.2.4-3	"
28.	3.1.1-2	Describe symptoms of illness, including identifying parts of the body; interpret doctor's directions
29.	3.1.1-2	"
30.	4.2.1-3	Interpret wages, wage deductions, benefits, and timekeeping forms
31.	4.2.1-3	"
32.	4.4.3-1	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
33.	4.4.3-1	"
34.	1.9.4-2	Interpret maps related to driving
35.	3.2.3-2	Interpret information associated with medical, dental, or life insurance
36.	3.2.3-2	"
37.	3.2.3-2	"
38.	4.4.2-2	Identify appropriate skills and education for keeping a job and getting a promotion

Table e1-14 ECS Reading Form 116 Competencies

Item	Competency	Learner will demonstrate the ability to:
1.	3.1.3-2	Identify and utilize appropriate health care services and facilities, including interacting with providers
2.	3.1.3-2	"
3.	4.2.1-1	Interpret wages, wage deductions, benefits, and timekeeping forms
4.	4.2.1-1	"
5.	4.2.4-3	Interpret employee handbooks, personnel policies, and job manuals
6.	4.2.4-3	"
7.	4.2.4-3	"
8.	1.8.2-1	Interpret the procedures and forms associated with banking services, including writing checks
9.	2.2.5-2	Use maps relating to travel needs
10.	2.2.5-2	"
11.	4.3.2-3	Interpret work safety manuals and related information
12.	4.3.2-3	"
13.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
14.	4.4.3-2	"
15.	4.4.3-2	"
16.	4.5.5-3	Demonstrate basic computer skills and use of common software programs, including reading or interpreting computer-generated printouts
17.	4.5.5-3	"
18.	4.5.5-2	"
19.	4.1.2-1	Follow procedures for applying for a job, including interpreting and completing job applications, résumés, and letters of application
20.	4.1.2-1	"
21.	4.1.4-3	Identify and use information about training opportunities
22.	4.1.4-3	"
23.	4.1.5-3	Identify procedures involved in interviewing for a job, such as arranging for an interview, acting and dressing appropriately, and selecting appropriate questions and responses
24.	4.1.5-3	"
25.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
26.	4.4.3-2	"
27.	4.8.1-3	Demonstrate ability to work cooperatively with others as a member of a team, contributing to team efforts, maximizing the strengths of team members, promoting effective group interaction, and taking personal responsibility for accomplishing goals
28.	4.8.1-3	"
29.	4.8.1-3	"
30.	4.1.2-3	Follow procedures for applying for a job, including interpreting and completing job applications, résumés, and letters of application
31.	4.1.2-3	"
32.	4.1.2-3	"
33.	4.5.6-3	Demonstrate ability to select, set up and use tools and machines in order to accomplish a task, while operating within a technological system
34.	4.5.6-3	"
35.	4.5.6-3	"
36.	4.8.3-3	Demonstrate effective communication skills in working with customers and clients
37.	4.8.3-3	"
38.	4.8.3-3	"

Table e1-15 ECS Reading Form 215 Competencies

Item	Competency	The learner will demonstrate the ability to:
1.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships
2.	4.3.2-3	Interpret work safety manuals and related information
3.	4.3.2-3	Interpret work safety manuals and related information
	7.2.1	Identify and paraphrase pertinent information
4.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	4.6.5	Select and analyze work-related information for a given purpose and communicate it to others orally or in writing
5.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	4.6.5	Select and analyze work-related information for a given purpose and communicate it to others orally or in writing
6.	4.6.5-3	Select and analyze work-related information for a given purpose and communicate it to others orally or in writing
7.	4.6.5-3	Select and analyze work-related information for a given purpose and communicate it to others orally or in writing
8.	4.4.4-3	Interpret job responsibilities and performance reviews
9.	4.4.4-3	Interpret job responsibilities and performance reviews
10.	4.6.2-1	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
11.	4.3.3-3	Identify safe work procedures and common safety equipment, including wearing safe work attire
	4.3.2	Interpret work safety manuals and related information
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
12.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.5.3	Demonstrate ability to use a filing system or other ordered system (e.g., coded or numbered)
	4.8.3	Demonstrate effective communication skills in working with customers and clients
13.	4.4.3-1	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	2.1.7	Take and interpret telephone messages, leave messages on answering machines, and interpret recorded messages
	4.6.2	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
14.	4.7.2-3	Identify or demonstrate effective management of material resources, including acquisition, storage, and distribution
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
15.	4.7.2-3	Identify or demonstrate effective management of material resources, including acquisition, storage, and distribution
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships
16.	3.4.2-3	Identify safety measures that can prevent accidents and injuries
	4.3.2	Interpret work safety manuals and related information

Item	Competency	The learner will demonstrate the ability to:
17.	1.9.6-2	Interpret information related to automobile maintenance
	4.5.7	Demonstrate ability to identify and resolve problems with machines and to follow proper maintenance procedures
	4.3.2	Interpret work safety manuals and related information
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
18.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	4.6.1	Follow, clarify, give, or provide feedback to instructions; give and respond appropriately to criticism
	4.4.6	Interpret work specifications and quality standards
19.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	4.6.1	Follow, clarify, give, or provide feedback to instructions; give and respond appropriately to criticism
	4.4.6	Interpret work specifications and quality standards
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
20.	4.7.2-2	Identify or demonstrate effective management of material resources, including acquisition, storage, and distribution
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	7.2.3	Make comparisons, differentiating among, sorting, and classifying items, information, or ideas
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
21.	4.7.2-3	Identify or demonstrate effective management of material resources, including acquisition, storage, and distribution
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	7.2.1	Identify and paraphrase pertinent information
22.	4.4.6-3	Interpret work specifications and quality standards
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.5.1	Identify common tools, equipment, machines, and materials required for one's job
	7.2.2	Analyze a situation, statement, or process, identifying component elements
23.	4.4.6-3	Interpret work specifications and quality standards
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.5.1	Identify common tools, equipment, machines, and materials required for one's job
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships
24.	4.4.6-3	Interpret work specifications and quality standards
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.8	Interpret job-related technical information, such as from service manuals and training classes
25.	4.4.6-3	Interpret work specifications and quality standards
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.8	Interpret job-related technical information, such as from service manuals

Item	Competency	The learner will demonstrate the ability to:
		and training classes
26.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	1.1.3	Interpret maps and graphs
	4.4.6	Interpret work specifications and quality standards
27.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	4.6.4	Report progress on activities, status of assigned tasks, and problems and other situations affecting job completion
28.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	4.6.4	Report progress on activities, status of assigned tasks, and problems and other situations affecting job completion
29.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.6	Interpret work specifications and quality standards
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships
	4.4.5	Identify job training needs and set learning goals
30.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.6	Interpret work specifications and quality standards
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships
	4.4.5	Identify job training needs and set learning goals
31.	1.9.4-2	Interpret maps related to driving
	2.2.5	Use maps relating to travel needs
	2.2.1	Ask for, give, follow, or clarify directions
32.	4.4.3-5	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.8	Interpret job-related technical information, such as from service manuals and training classes
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships
33.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
34.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
35.	4.5.6-3	Demonstrate ability to select, set up and use tools and machines in order to accomplish a task, while operating within a technological system
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.8	Interpret job-related technical information, such as from service manuals and training classes
36.	4.5.6-3	Demonstrate ability to select, set up and use tools and machines in order to accomplish a task, while operating within a technological system
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.8	Interpret job-related technical information, such as from service manuals and training classes

Table e1-16 ECS Reading Form 216 Competencies

Item	Competency	The learner will demonstrate the ability to:
1.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
2.	4.3.3-3	Identify safe work procedures and common safety equipment, including wearing safe work attire
	4.6.5	Select and analyze work-related information for a given purpose and communicate it to others orally or in writing
3.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
4.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
5.	4.3.1-4	Interpret safety signs found in the workplace
6.	4.7.2-2	Identify or demonstrate effective management of material resources, including acquisition, storage, and distribution
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	7.2.3	Make comparisons, differentiating among, sorting, and classifying items, information, or ideas
7.	4.7.2-2	Identify or demonstrate effective management of material resources, including acquisition, storage, and distribution
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
8.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	1.1.3	Interpret maps and graphs
	4.4.6	Interpret work specifications and quality standards
9.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	4.6.1	Follow, clarify, give, or provide feedback to instructions; give and respond appropriately to criticism
	4.4.6	Interpret work specifications and quality standards
10.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	4.6.1	Follow, clarify, give, or provide feedback to instructions; give and respond appropriately to criticism
	4.4.6	Interpret work specifications and quality standards
11.	3.4.2-3	Identify safety measures that can prevent accidents and injuries
	4.3.2	Interpret work safety manuals and related information
12.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
	4.6.4	Report progress on activities, status of assigned tasks, and problems and other situations affecting job completion
13.	4.4.3-2	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.5.3	Demonstrate ability to use a filing system or other ordered system (e.g., coded or numbered)
	4.8.3	Demonstrate effective communication skills in working with customers and clients

Item	Competency	The learner will demonstrate the ability to:
14.	4.7.2-3	Identify or demonstrate effective management of material resources, including acquisition, storage, and distribution
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships
15.	4.7.2-3	Identify or demonstrate effective management of material resources, including acquisition, storage, and distribution
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
16.	4.4.4-3	Interpret job responsibilities and performance reviews
17.	4.4.4-3	Interpret job responsibilities and performance reviews
	4.4.2	Identify appropriate skills and education for keeping a job and getting a promotion
18.	1.9.6-2	Interpret information related to automobile maintenance
	4.5.7	Demonstrate ability to identify and resolve problems with machines and to follow proper maintenance procedures
	4.3.2	Interpret work safety manuals and related information
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
19.	4.4.6-3	Interpret work specifications and quality standards
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.5.1	Identify common tools, equipment, machines, and materials required for one's job
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships
20.	4.4.6-3	Interpret work specifications and quality standards
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.5.1	Identify common tools, equipment, machines, and materials required for one's job
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
21.	4.2.1-3	Interpret wages, wage deductions, benefits, and timekeeping forms
	3.2.3	Interpret information associated with medical, dental, or life insurance
22.	4.2.1-3	Interpret wages, wage deductions, benefits, and timekeeping forms
	3.2.3	Interpret information associated with medical, dental, or life insurance
23.	4.3.3-3	Identify safe work procedures and common safety equipment, including wearing safe work attire
	4.3.1	Interpret safety signs found in the workplace
24.	4.3.3-3	Identify safe work procedures and common safety equipment, including wearing safe work attire
	4.3.1	Interpret safety signs found in the workplace
25.	1.9.4-2	Interpret maps related to driving
	2.2.5	Use maps relating to travel needs
	2.2.1	Ask for, give, follow, or clarify directions
26.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.5.1	Identify common tools, equipment, machines, and materials required for one's job
	4.5.7	Demonstrate ability to identify and resolve problems with machines and to follow proper maintenance procedures

Item	Competency	The learner will demonstrate the ability to:
27.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.5.1	Identify common tools, equipment, machines, and materials required for one's job
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
28.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.6	Interpret work specifications and quality standards
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships
	4.4.5	Identify job training needs and set learning goals
29.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.6	Interpret work specifications and quality standards
	4.4.5	Identify job training needs and set learning goals
30.	4.4.3-1	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	2.1.7	Take and interpret telephone messages, leave messages on answering machines, and interpret recorded messages
	4.6.2	Interpret and write work-related correspondence, including notes, memos, letters, and e-mail
31.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.6	Interpret work specifications and quality standards
32.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.6	Interpret work specifications and quality standards
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships
33.	4.4.6-3	Interpret work specifications and quality standards
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.8	Interpret job-related technical information, such as from service manuals and training classes
34.	4.4.6-3	Interpret work specifications and quality standards
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.8	Interpret job-related technical information, such as from service manuals and training classes
35.	4.5.6-3	Demonstrate ability to select, set up and use tools and machines in order to accomplish a task, while operating within a technological system
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.8	Interpret job-related technical information, such as from service manuals and training classes
36.	4.5.6-3	Demonstrate ability to select, set up and use tools and machines in order to accomplish a task, while operating within a technological system
	4.4.3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	4.4.8	Interpret job-related technical information, such as from service manuals and training classes

Table e1-17 ECS Reading Form 17 Competencies

Item	Comp.	The learner will demonstrate the ability to:
1.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
2.	4.6.4-3	Report progress on activities, status of assigned tasks, and problems and other situations affecting job completion
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
3.	4.6.4-3	Report progress on activities, status of assigned tasks, and problems and other situations affecting job completion
	7.2.5	Evaluate a situation, statement, or process, assembling information and providing evidence, making judgments, examining assumptions, and identifying contradictions
4.	4.6.4-3	Report progress on activities, status of assigned tasks, and problems and other situations affecting job completion
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
5.	4.2.1-3	Interpret wages, wage deductions, benefits, and timekeeping forms
6.	4.2.1-3	"
7.	4.2.1-3	"
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
8.	4.3.2-2	Interpret work safety manuals and related information
9.	4.3.2-2	"
10.	4.3.2-2	"
11.	2.5.9-2	Identify child care services in the community
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
12.	2.5.9-2	Identify child care services in the community
13.	4.6.4-3	Report progress on activities, status of assigned tasks, and problems and other situations affecting job completion
	7.2.5	Evaluate a situation, statement, or process, assembling information and providing evidence, making judgments, examining assumptions, and identifying contradictions
14.	4.6.4-3	Report progress on activities, status of assigned tasks, and problems and other situations affecting job completion
	7.3.1	Identify a problem and its possible causes
15.	4.6.4-3	Report progress on activities, status of assigned tasks, and problems and other situations affecting job completion
	7.3.2	Devise and implement a solution to an identified problem
16.	4.5.7-2	Demonstrate ability to identify and resolve problems with machines and to follow proper maintenance procedures
	7.4.8	Interpret visual representations, such as symbols, blueprints, flowcharts, and schematics
17.	4.5.7-2	Demonstrate ability to identify and resolve problems with machines and to follow proper

		maintenance procedures
	7.4.8	Interpret visual representations, such as symbols, blueprints, flowcharts, and schematics
18.	4.5.7-2	Demonstrate ability to identify and resolve problems with machines and to follow proper maintenance procedures
	7.4.8	Interpret visual representations, such as symbols, blueprints, flowcharts, and schematics
19.	4.5.6-3	Demonstrate ability to select, set up and use tools and machines in order to accomplish a task, while operating within a technological system
20.	4.5.6-3	"
	7.2.1	Identify and paraphrase pertinent information
21.	4.5.6-3	Demonstrate ability to select, set up and use tools and machines in order to accomplish a task, while operating within a technological system
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships
22.	4.5.6-3	Demonstrate ability to select, set up and use tools and machines in order to accomplish a task, while operating within a technological system
	7.2.3	Make comparisons, differentiating among, sorting, and classifying items, information, or ideas
23.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
24.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
25.	4.4.3-3	"
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
26.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
27.	4.3.2-2	Interpret work safety manuals and related information
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
28.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, and letters
29.	4.6.2-3	"
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships
30.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, and letters
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships

Table e1-18 ECS Reading Form 18 Competencies

Item	Comp.	The learner will demonstrate the ability to:
1.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
2.	4.6.4-3	Report progress on activities, status of assigned tasks, and problems and other situations affecting job completion
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships
3.	4.6.4-3	Report progress on activities, status of assigned tasks, and problems and other situations affecting job completion
	7.2.5	Evaluate a situation, statement, or process, assembling information and providing evidence, making judgments, examining assumptions, and identifying contradictions
4.	4.6.4-3	Report progress on activities, status of assigned tasks, and problems and other situations affecting job completion
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
5.	4.2.1-3	Interpret wages, wage deductions, benefits, and timekeeping forms
6.	4.2.1-3	"
7.	4.2.1-3	"
8.	4.3.2-2	Interpret work safety manuals and related information
9.	4.3.2-2	"
10.	4.3.2-2	"
11.	4.6.4-3	Report progress on activities, status of assigned tasks, and problems and other situations affecting job completion
	7.2.5	Evaluate a situation, statement, or process, assembling information and providing evidence, making judgments, examining assumptions, and identifying contradictions
12.	4.6.4-3	Report progress on activities, status of assigned tasks, and problems and other situations affecting job completion
	7.3.1	Identify a problem and its possible causes
13.	4.6.4-3	Report progress on activities, status of assigned tasks, and problems and other situations affecting job completion
	7.3.2	Devise and implement a solution to an identified problem
14.	4.5.7-2	Demonstrate ability to identify and resolve problems with machines and to follow maintenance procedures
	7.4.8	Interpret visual representations, such as symbols, blueprints, flowcharts, and schematics
15.	4.5.7-2	Demonstrate ability to identify and resolve problems with machines and to follow proper maintenance procedures
	7.4.8	Interpret visual representations, such as symbols, blueprints, flowcharts, and schematics
16.	4.5.7-2	Demonstrate ability to identify and resolve problems with machines and to follow proper maintenance procedures
	7.4.8	Interpret visual representations, such as symbols, blueprints, flowcharts, and schematics
17.	4.5.6-3	Demonstrate ability to select, set up and use tools and machines in order to accomplish a task, while operating within a technological system
18.	4.5.6-3	"

	7.2.1	Identify and paraphrase pertinent information
19.	4.5.6-3	Demonstrate ability to select, set up and use tools and machines in order to accomplish a task, while operating within a technological system
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships
20.	4.5.6-3	Demonstrate ability to select, set up and use tools and machines in order to accomplish a task, while operating within a technological system
	7.2.3	Make comparisons, differentiating among, sorting, and classifying items, information, or ideas
21.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
22.	4.4.3-3	"
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
23.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
24.	4.4.3-3	Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.
	7.2.2	Analyze a situation, statement, or process, identifying component elements and causal and part/whole relationships
25.	4.6.2-3	Interpret and write work-related correspondence, including notes, memos, and letters
26.	4.6.2-3	"
27.	4.6.2-3	"
28.	4.3.2-2	Interpret work safety manuals and related information
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary
29.	2.5.9-2	Identify child care services in the community
30.	2.5.9-2	"
	7.2.4	Identify or make inferences through inductive and deductive reasoning to hypothesize, predict, conclude, and synthesize; distinguish fact from opinion, and determine what is mandatory and what is discretionary

Item e2 – Whether the items or tasks measure skills that are not associated with the NRS educational functioning levels

All items in the ECS Reading Assessments measure skills that are associated with the NRS educational functioning levels. The ECS Reading Assessments do not measure competencies or skills that are not tied to the NRS educational functioning levels for ABE and ESL adults.

Item e3 – Whether aspects of a particular NRS educational functioning level are not covered by any of the items or tasks

The items that comprise the assessments in the ECS Reading Assessments measure skills that span the continuum within and across each of the NRS educational functioning levels.

Item e4 – The procedures used to establish the content validity of the test

Reading as measured in the ECS Reading Assessments is in functional contexts commonly encountered in employment related settings. The competencies – or the content – selected to measure reading was determined by conducting a statewide survey of California business and industry, workforce developers and trainers, and adult educators preparing learners for employment. They identified and prioritized a subset of the CASAS Competencies as being critical and important for jobs that do not require postsecondary degrees. This set of priority competencies provided the content framework for the ECS reading pre- and post-tests. The competencies included on the ten ECS Reading test forms are listed in Tables e1-5 through e1-14.

The competencies – or the content – selected to measure reading in the WLS series was determined by results collected over a 12-year period from the Workforce Learning System (WLS) Basic Skills Analysis process used in hundreds of businesses in many states. CASAS summarized the WLS competencies – a subset of the CASAS Competencies – identified by a broad section of industries as being critical and important basic skills for jobs that do not require postsecondary degrees. These results confirmed what other national initiatives also identified as critical work-related basic skills needed for success in today's job market. This set of priority competencies provided the content framework for the WLS reading pre- and post-tests. The competencies included on the WLS Reading test forms appear in Tables e1-15 through e1-18.

Content validity of the ECS Reading assessments were established through panels of educational specialists who provided assurance that the test items developed for each specific set of tests accurately assessed reading skills in the context of the identified competencies.

CASAS test items are based on the application of functional language or math skills in realistic life-skill or workplace contexts. Every item addresses one or more competency. For example:

A reading item assessing competency 4.3.3 *Interpret safe work procedures, safety manuals, and related information such as ergonomic requirements*, might involve reading a memo on safe work practices for child-care workers or following written procedures for safely operating a gas furnace. According to their content these items would also address 4.6.2 *Interpret and write work-related correspondence, including notes, memos, letters, and e-mail* and 4.4.3 *Interpret job-related signs, charts, diagrams, forms, and procedures, and record information on forms, charts, checklists, etc.*, and perhaps other competencies. Test items also are presented in a variety of task types:

- Forms
- Charts, maps, consumer billings, matrices, graphs or tables
- Articles, paragraphs, sentences, directions, manuals
- Signs, price tags, advertisements or product labels
- Measurement scales or diagrams

Item e5 – The number of subject matter experts who provided judgments linking the items or tasks to the NRS educational functioning levels and their qualifications for doing so, particularly their familiarity with adult education and the NRS educational functioning levels

At the request of the CASAS National Consortium - representing approximately 30 states - CASAS developed reading basic skills content standards as a formal part of the CASAS system. This National Consortium project was coordinated with the assistance of a thirteen-state technical workgroup comprised of reading subject matter experts. The initial process included a review of existing state adult education content standards for California, New York, Massachusetts, Arizona, Maryland, and Florida, as well as a review of a variety of other national and state standards documents. The National Consortium Technical Workgroup used this information as a basis to begin development and pilot testing of the CASAS Basic Skills Content Standards. These standards were then correlated to CASAS performance levels, the WIA II National Reporting System levels, and aligned to CASAS assessments. Several states extensively field-tested the content standards to ensure they were complete and that they were aligned with CASAS and NRS levels. These basic skills content standards assist adult education instructors identify the underlying basic skills embedded in employment related life skill competencies to strengthen teaching and learning.

(f)– Match of scores to the NRS educational functioning levels. Documentation of the adequacy of the procedure used to translate the performance of an examinee on a particular test to an estimate of the examinee's standing with respect to the NRS educational functioning levels

Item f1 – The standard-setting procedures used to establish cut scores for transforming raw or scale scores on test into estimates of an examinee's NRS educational functioning level

The initial goal of CASAS since the 1980s was to develop a adult competency measurement scale that would assist adult educators in describing the functional performance capabilities and levels of their learners. The adult competency measurement scale to be developed needed to be sensitive to the learning accomplishment of learners enrolled in the various levels of ABE, ASE, and ESL classes. Learners used in the development of the initial scale were enrolled in classes that were supported in part by federal adult education act funding — currently WIA Title II. It was decided by a group of California adult education practitioners, and later verified by national leaders and state directors of adult education, that item content and presentation formats should reflect the content and competencies underlying both the Adult Performance Level Study (1974) and the California High School Proficiency Examination (1975) that measured the attainment of basic skills in a functional life skills context. These item types later were expanded to include employment-related contexts and measured, in addition to reading and math, listening and writing.

The strategy was to create items and to field-test them on adult education learners who could successfully handle common, noncomplex reading and math in a life skills context. Learners enrolled at the intermediate levels of adult education were chosen as examinees for the initial field-testing and linking of items to a common adult competencies measurement scale. The Rasch IRT scaling procedure was chosen to facilitate the concurrent calibration and the vertical equating of the field-tested items. Using these scaling procedures, easier and more difficult items were added to extend the adult competencies measurement scale both lower and higher. A reporting scale was developed that was distinct from other K-12 and college entrance educational scales by centering the CASAS scale with a mean of 200 with a standard deviation of 10 scale points.

The content and competencies were analyzed for the items forming the typical CASAS scale score ranges of adult (theta) ability values from below 170 to 240 and above and were found to compare favorably with the findings from other national studies, including the Student Performance Level Study conducted by the Center for Applied Linguistics (CAL, 1984). These scale ranges were then used to describe and level instruction while providing a reporting mechanism for programs and states adopting CASAS throughout the nation for their adult education and literacy learners.

In the mid-1990s, with the development and establishment of the National Reporting System (NRS), these CASAS scale score ranges were reviewed and modified to fit the

current NRS educational functioning levels used to report the performance of learners enrolled in adult education and literacy programs supported in part by federal funding under WIA Title II. These new scale ranges were presented to the United States Department of Education – Adult Education by Patricia Rickard to Ronald Pugsley (personal communication, April 5, 1996).

On each parallel test form pairing in the ECS Reading Assessment Series, the accurate range of scale scores covering more than one NRS educational functioning level is identified. The conditional standard error (CSEM) for all NRS cut scores is less than 5.6.

Standard Setting Cut Score Study

In February and March 2008, CASAS conducted formal performance standard setting studies as part of its process to periodically review and continuously validate all CASAS assessments. The goal was to use a test-centered judgment based standard setting procedure to re-examine and provide evidence of the relationship between CASAS scale scores and the NRS Educational Functioning Levels.

While performance level cut scores are the result of a subjective judgment process by subject matter experts (SMEs) and are impossible to prove as correct (ETS, 2004), performance level cut score validation studies provide useful information if conducted using a carefully followed procedural design with expert SMEs.

Separate performance level standard setting studies were conducted for each skill area or "modality" – reading, math, and listening. The results of the standard setting process for the reading modality are included in Tables f1-1 and f1-2. The cut scores and scale were reviewed for consistency with the reporting and analytical guidelines and standards established in the ETS Standards for Quality and Fairness (ETS, 2002).

A group of demographically diverse SMEs in adult education within each specific skill area were convened to identify the performance level descriptors and cut scores which separate each of the NRS Educational Functioning Levels. From the panelists who were invited to participate for each skill area, two similar but independent panels were formed, with different panel leaders/facilitators, so that the results from each panel could be compared for consistency.

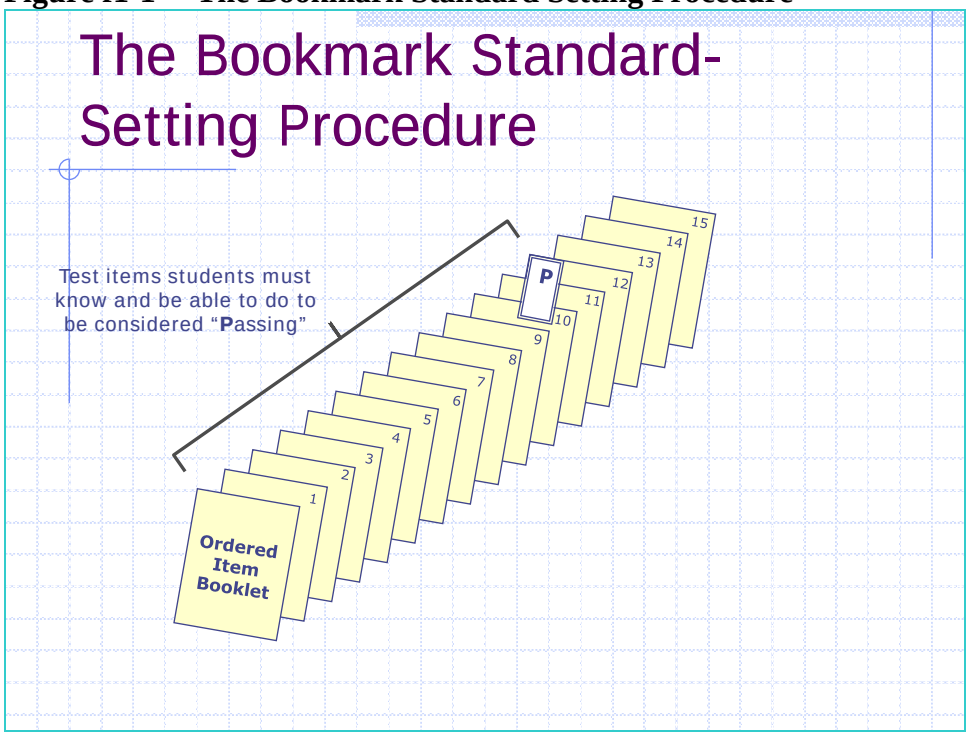
Panels consisted of four to six adult education experts with two separate panels for each modality (reading, math, and listening). Selection of panelists was based on their individual relevant adult education expertise and their ability to devote uninterrupted time to the study. Each panel was conducted remotely over a consecutive two-day period. Panelists included experienced teachers, professional development specialists and adult education administrators from a variety of backgrounds, including the local agency level and state education departments. On the reading panel participants' adult education experience ranged from 14 – 20 years, leading to a qualified group of SMEs. There were nine states represented in the two reading panels, seven states in the listening panels, and six states in the math panels, encompassing 15 states in all four continental US time zones (CA, CO, CT, DC, FL, IA, KS, MD, MI, MN, NC, OH, OR, RI, VA). A list of the

panelists and their relevant experience is included in Table f2i-1 and f2i-2. A survey of panelists conducted at the end of the study found that they were generally satisfied with the way that the study was conducted, including clear explanations, facilitation procedures and materials, and adequate time to process and discuss their responses.

The Bookmark standard setting method, a common technique for setting multiple performance standard setting cut points for tests that use Item Response Theory (IRT), was chosen to allow for SMEs to identify the cut scores that they deemed appropriate for each of the NRS Functioning Levels. This method was possible and appropriate for the CASAS assessments due to the availability of extensive IRT data on each test question.

The bookmark standard setting method is displayed visually in Figures f1-1 and f1-2 (Maryland State Department of Education, 2004).

Figure f1-1 The Bookmark Standard Setting Procedure



The implementation of the Bookmark method follows the general guidelines outlined in *A Primer on Setting Cut Scores on Tests of Educational Achievement* (ETS, 2004). Judgment experts were provided Ordered Item Booklets (OIBs) which included actual multiple-choice test items in order of difficulty from easiest to most difficult. All items in the odd-numbered parallel test forms were included from the ECS reading series in order to adequately represent the entire content, task areas, and difficulty range of the tests in the ECS reading series. Items from other ECS reading test forms were also included to expand the number of items at the existing CASAS defined NRS cut scores. There were a total of 385 items in the Reading OIB.

Figure f1-2 The Bookmark Standard Setting Procedure (cont.)

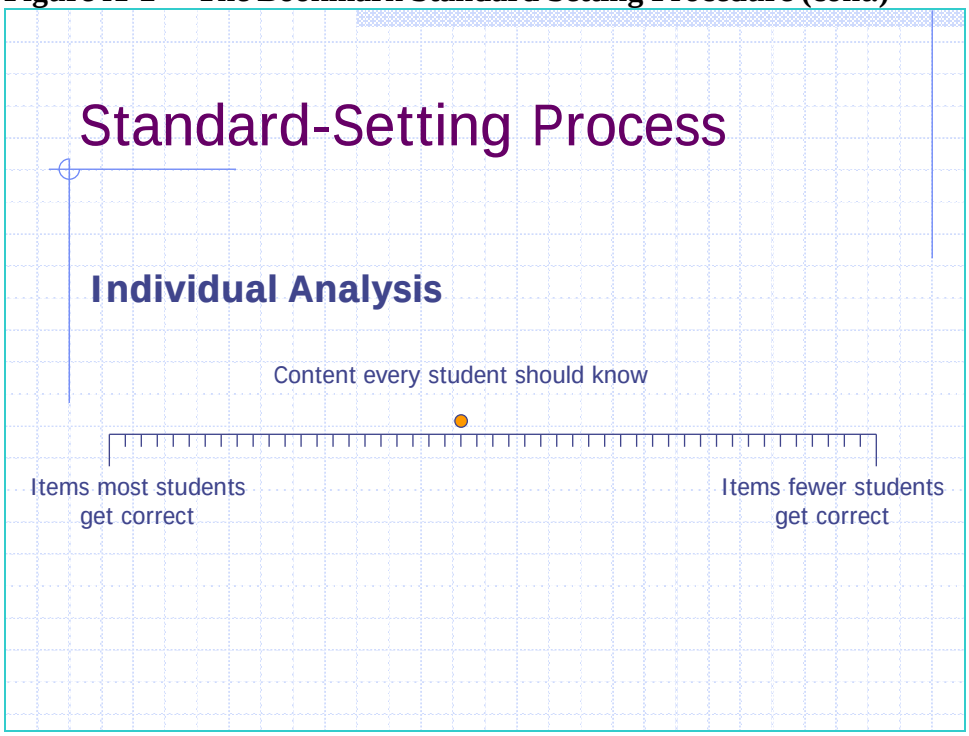
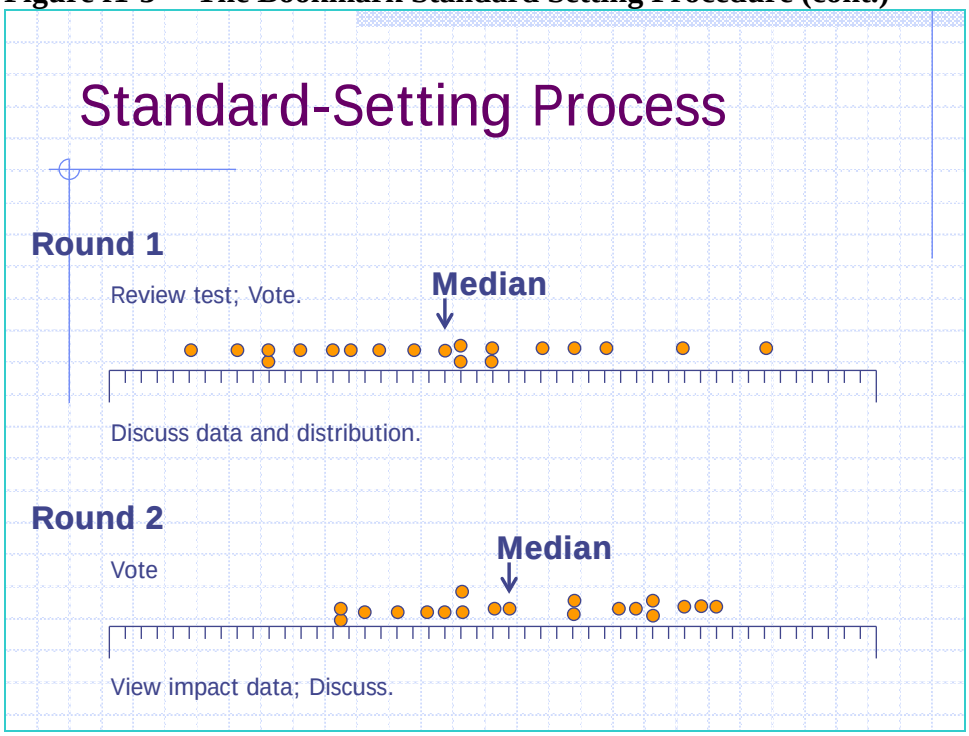


Figure f1-3 The Bookmark Standard Setting Procedure (cont.)



The SMEs were provided information on the content standards, performance level descriptors, a bookmark recording form and the ordered item booklets described above including item type, item directions, and the correct answer for each question, in addition to the display/prompt, stem and distracters.

The panel leader began each panel with an explanation of the purpose of the study and the bookmark standard setting procedure and process. The panel leader also led the panelists through a detailed examination of the NRS Educational Functioning Level descriptors for each level, focusing on the descriptors that were relevant for each panel's work. The Reading panel reviewed the descriptor language related to reading from the "Basic Reading and Writing" and the "Functional and Workplace Skills" columns for both ABE and ESL.

Three rounds of bookmark placements were conducted for each modality (reading, math and listening). For each judgment round, the SMEs, working individually and independently, were asked to place a bookmark between the most difficult question that borderline or minimally competent examinees would be likely to answer correctly at least 50 percent of the time, and the easiest question that they would not be likely to answer correctly at least 50 percent of the time at the border or transition between NRS Educational Functioning Levels. Thus, the Bookmark response probability or RP value for these studies was RP50. The panel members then reconvened to discuss their individual bookmark placements for each round. Feedback was provided to the SME panelists regarding the high, low and median bookmark placements.

Between the second and third rounds, the panelists were provided with impact data from three states contained in two summary tables. The first table contained the percentage of students placed in each NRS level using the current CASAS cut points for California, Oregon and Iowa, as well as aggregate data for the three states. The second table contained the percentage of students placed in each NRS level using the standard setting panel group median Round 2 bookmark recommendations if they were implemented. The panelists were then able to compare results from the two sets of performance levels (percent of examinees from existing NRS levels from three states and the percent of examinees at the NRS levels using the standard setting panel performance levels). By examining the changes in percentages of students that would be placed in each NRS level using the standard setting panel recommendations, they could see the effects or impacts of their individual and group panel median bookmark recommendations. The panelists could see if they did in fact believe, for example, that 20 percent of students should be enrolled in Low Adult Secondary Education, as compared to 10 percent using the current NRS performance levels for the three states.

The impact data provided another perspective for panelists to consider in making adjustments to their bookmarks if they perceived important differences between their knowledge and understanding of this student population and the effects of their existing Round 2 bookmark placements. During this process, the panelists were not provided with the related CASAS scale scores. Panelists discussed the ramifications of the impact data, and then had an opportunity to revise or maintain their bookmarks for the last judgment round.

Once the panels concluded their work, the results were examined comparing the current NRS cut points and the recommendations from the two independent standard setting panels for each of the three modalities (reading, math and listening).

Results of the existing NRS cut score levels and the results from the two independent panels of SME judges for ABE Reading and ESL Reading are summarized below in Tables f1-1 and f1-2. Note the high degree of consistency between the three performance level cut scores from the existing CASAS NRS cut scores and the recommended performance level cut scores recommended by the independent panels from the standard setting study. Evidence regarding the agreement between the judgments of the independent panels of SMEs is presented in item f2ii and Tables f2ii-1 and f2ii-2.

Table f1-1 Standard Setting Cut Score Study Results – ABE Reading

CASAS Reading Level Validation Study -- ABE

NRS ABE Educational Functioning Levels	CASAS Cut Score	Panel 1 Cut Score	Panel 2 Cut Score
Beg. ABE Literacy	200 and below	200 and below	203 and below
Beg. Basic Ed.	201	201	204
Low Int. Basic	211	210	212
High Int. Basic	221	219	220
Low Adult Secondary	236	230	231
High Adult Sec	246	240	238

Table f1-2 Standard Setting Cut Score Study Results – ESL Reading

CASAS Reading Level Validation Study -- ESL

NRS ESL Educational Functioning Levels	CASAS Cut Score	Panel 1 Cut Score	Panel 2 Cut Score
Beg. ESL Literacy	180 and below	180 and below	187 and below
Low Beg ESL	181	181	188
High Beg. ESL	191	193	198
Low Int. ESL	201	201	204
High Int. ESL	211	210	212
Adv. ESL	221	219	220
Exit from Advanced ESL	236	230	231

Standard setting is a judgment based process which provides valuable advisory information to be reviewed and considered by the standard setting policy body. In the final stage of the standard setting process, CASAS reviewed the panels' recommendations in the light of other research and policy considerations. For all NRS instructional levels except for advanced levels, the results of the performance standard setting study confirmed the validity of the current CASAS NRS cut scores for the Educational Functioning Levels. At the advanced level, additional score validity studies

are recommended. Current studies cited in this technical manual, including the CASAS/GED Study, the CASAS WorkKeys Study, and the CASAS/CAHSEE Study all indicate that the current cut scores at the advanced levels are appropriate.

Item f2 – Judgment-based procedures

(f2i) The number of subject-matter experts who provided judgments, and their qualifications

Table f2i-1 Standard Setting Cut Score Study – Panelist Information

Modality	Number of Panelists	States Represented	Experience in Adult Education (Range in Years)
Reading Panel 1	6	CA (2), CO, CT, DC, OR	16 - 26
Reading Panel 2	5	CA, CO, NC, RI, VA	14 -28

Table f2i-2 Standard Setting Cut Score Study – Detailed Panelist Information

Modality	Panel Leader & Dates	Participants-Title
Reading Panel 1	Feb. 27 -28, 2008	**Panelist #1a**, OR- Director of Skills Development, Tillamook Bay CC **Panelist #1b,** CT-Site Coordinator Northeast Adult Ed., EASTCONN **Panelist #1c**, CO- Director, Northern Colorado Professional Development Resource Center **Panelist #1d**, DC-Director of Professional Development, Adult and Family Ed., Office of the State Superintendent of Ed. **Panelist #1e,** CA- Program Specialist, CASAS **Panelist #1f**, CA- Program Specialist, CASAS
Reading Panel 2	March 3 – 4, 2008	**Panelist #2a,** ESL Division Director, Colorado Mountain College **Panelist #2b**, CA-Resource TSA, Sweetwater Union High School District **Panelist #2c**, RI- Director of Accountability, Rhode Island RAL **Panelist #2d**, VA- ESL Instructor, **Panelist #2e**, NC-ESL Coordinator, Isothermal CC

(f2ii) – Evidence of the extent to which the judgments of subject matter experts agree

Tables f2ii-1 and f2ii-2 expand on the results presented in Tables f1-1 and f2-1. These tables provide evidence of the extent to which the judgments of the SMEs were in agreement. To guide in the interpretation of the table, the column headings can be defined as follows:

Panel One Difference/Panel Two Difference – reports the difference between the cut score arrived at by each panel compared to the current CASAS Cut Score. Positive values indicate that the standard setting panel cut score means were above the current CASAS NRS Level Cut Score. Negative values indicate that the standard setting panel cut score means were below the current CASAS NRS Level Cut Score.

Panel One Standard Dev/Panel Two Standard Dev – reports the standard deviation of the individual panel members cut scores.

Mean Difference – reports the mean difference of the cut scores arrived at by the two panels compared to the current CASAS cut score.

Table f2ii-1 Standard Setting Cut Score Study SMEs Agreement - ABE

NRS ABE Educational Functioning Levels	CASAS Cut Score	Panel One Difference	Panel One Standard Error	Panel Two Difference	Panel Two Standard Error	Mean Difference
Beg. ABE Literacy	200 and below					
Beg. Basic Ed.	201	1	0.49	3	0.45	2
Low Int. Basic	211	-1	0.82	1	0.00	0
High Int. Basic	221	-2	0.26	-1	0.93	-1.5
Low Adult Secondary	236	-6	0.17	-5	0.60	-5.5
High Adult Sec	246	-6	0.17	-8	0.40	-7

Table f2ii-2 Standard Setting Cut Score Study SMEs Agreement - ESL

NRS ESL Educational Functioning Levels	CASAS Cut Score	Panel One Difference	Panel One Standard Dev.	Panel Two Difference	Panel Two Standard Dev.	Mean Difference
Beg. ESL Literacy	180 and below					
Low Beg ESL	181	0	0.17	7	0.00	3.5
High Beg. ESL	191	2	0.00	7	0.20	4.5
Low Int. ESL	201	1	0.49	3	0.45	2
High Int. ESL	211	-1	0.82	1	0.00	0
Adv. ESL	221	-2	0.26	-1	0.93	-1.5
Exit from Adv. ESL	236	-6	0.17	-5	0.60	-5.5

Item f3 – The standard error of each cut score, and how it was established

Table f3-1 shows the relationship of CASAS levels to NRS educational functioning levels (EFL) for ABE and ASE. For example, an ABE student who scores 208 on an ECS Reading test is classified into CASAS level B and NRS Beginning Basic Education.

Table f3-1 Relationship of CASAS levels to NRS for ABE and ASE

NRS Educational functioning levels		CASAS Level	Reading Scale Score Ranges
1	Beginning ABE Literacy	A	200 and below
2	Beginning Basic Education	B	201-210
3	Low Intermediate Basic Education	B	211-220
4	High Intermediate Basic Education	C	221-235
5	Low Adult Secondary Education	D	236-245
6	High Adult Secondary Education	E	246 and above

Table f3-2 provides the conditional standard error (CSEM) for each ECS Reading scale score that is a cut point for an ABE and ASE NRS educational functioning level by form. For example, if an examinee is administered Form 13 and achieves a scale score of 200, the cut score associated between CASAS levels A and B and NRS educational functioning levels Beginning ABE Literacy and Beginning Basic Education, the CSEM is 3.7. This means that at the 68 percent confidence level the true scale score at a scale score of 200 falls within the range of 196.3 and 203.7. The recommended scale score range for each form is highlighted. This range corresponds to scores with a CSEM less than 5.6.

Table f3-2 ECS Reading Forms — CASAS NRS Functional Instructional Cut Score Points and CSEM for ABE and ASE

		Level A				Level B									
		Form 11		Form 12		Form 13		Form 14		Form 114		Form 213		Form 214	
	NRS Scale Score Cut Points	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM
Beginning ABE Literacy	180	180	4.7	180	4.7										
	190	190	4.5	190	4.6	191	4.4	191	4.4	191	4.4	191	4.4	191	4.4
	200	199	4.9	199	4.9	200	3.7	201	3.7	200	3.7	200	3.7	200	3.7
Beginning Basic Education	210					210	3.7	210	3.7	210	3.7	209	3.7	209	3.7
Low Intermediate Basic Education	220					220	4.4	221	4.4	220	4.4	220	4.4	220	4.4
High Intermediate Basic	235														
Low Adult Secondary Education	245														
High Adult Secondary Education	246+														

Table f3-2 ECS Reading Forms — CASAS NRS Functional Instructional Cut Score Points and CSEM for ABE and ASE (cont.)

		Level C										Level D			
		Form 15		Form 16		Form 116		Form 215		Form 216		Form 17		Form 18	
	NRS Scale Score Cut Points	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM
Beginning ABE Literacy	200	199	4.9	200	4.9	201	4.6	200	4.9	200	4.9				
Beginning Basic Education	210	209	3.7	210	3.7	209	3.6	210	3.9	210	3.9				
Low Intermediate Basic Education	220	220	3.4	221	3.4	220	3.4	220	3.5	220	3.5	220	4.7	221	4.7
High Intermediate Basic Education	235	235	4.3	236	4.3	234	4.2	236	4.4	234	4.2	234	3.9	234	3.9
Low Adult Secondary Education	245											245	4.2	245	4.2
High Adult Secondary Education	246+														

Table f3-3 shows the CASAS relationship to NRS educational functioning levels for ESL. For example, an ESL student who scores 217 on an ECS Reading test is classified into CASAS level B and NRS High Intermediate ESL. See Table f3-4 for the conditional standard error of measurement (CSEM) for each CASAS cut scale score corresponding to the NRS educational functioning levels for ESL.

Table f3-3 Relationship of CASAS levels to NRS for ESL

	NRS Educational functioning levels	CASAS Level	Reading Scale Score Ranges
1	Beginning ESL Literacy	A	180 and below
2	Low Beginning ESL	A	181-190
3	High Beginning ESL	A	191-200
4	Low Intermediate ESL	B	201-210
5	High Intermediate ESL	B	211-220
6	Low Advanced ESL	C	221-235

For a description of the calibration process and calculating scale scores, please refer to Item d2.

Table f3-4 provides the CSEM for each ECS Reading scale score that is a cut point for an ESL NRS educational functioning level by form. For example, if an examinee is administered Form 13 and achieves a scale score of 220, the cut score associated between CASAS levels B and C and NRS educational functioning level High Intermediate ESL and Low Advanced ESL, the CSEM is 4.4. This means that at the 68 percent confidence level the true scale score at a scale score of 220 falls within the range of 215.6 and 224.4. The recommended scale score range for each form is highlighted. This range corresponds to scores with a CSEM less than 5.6.

Table f3-4 CASAS NRS Functional Instructional Cut Score Points and CSEM for ESL

NRS Scale Score Cut Points		Level A				Level B									
		Form 11		Form 12		Form 13		Form 14		Form 114		Form 213		Form 214	
		Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM
Beginning ESL Literacy	180	180	4.7	180	4.7										
Low Beginning ESL	190	190	4.5	190	4.6	191	4.4	191	4.4	191	4.4	191	4.4	191	4.4
High Beginning ESL	200	199	4.9	199	4.9	200	3.7	201	3.7	200	3.7	200	3.7	200	3.7
Low Intermediate ESL	210					210	3.7	210	3.7	210	3.7	209	3.7	209	3.7
High Intermediate ESL	220					220	4.4	221	4.4	220	4.4	220	4.4	220	4.4
Advanced ESL	235														

Table f3-4 CASAS NRS Functional Instructional Cut Score Points and CSEM for ESL (cont.)

		Level C										Level D			
		Form 15		Form 16		Form 116		Form 215		Form 216		Form 17		Form 18	
	NRS Scale Score Cut Points	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM	Scale Score	CSEM
Beginning ESL Literacy	180														
Low Beginning ESL	190														
High Beginning ESL	200	199	4.9	200	4.9	201	4.6	200	4.9	200	4.9				
Low Intermediate ESL	210	209	3.7	210	3.7	209	3.6	210	3.9	210	3.9				
High Intermediate ESL	220	220	3.4	221	3.4	220	3.4	220	3.5	220	3.5	220	4.7	221	4.7
Advanced ESL	235	235	4.3	236	4.3	234	4.2	236	4.4	234	4.2	234	3.9	234	3.9

(g) Reliability. Documentation of the degree of consistency in performance across different forms of the test in the absence of any external interventions

Item g1 – The correlation between raw (or scale) scores across alternate forms of the test or, in the case of computerized adaptive tests, across alternate administrations of the test

The parallel forms that comprise the ECS Reading Assessments are constructed so that the two forms can be used independently of each other and are considered equivalent measures.

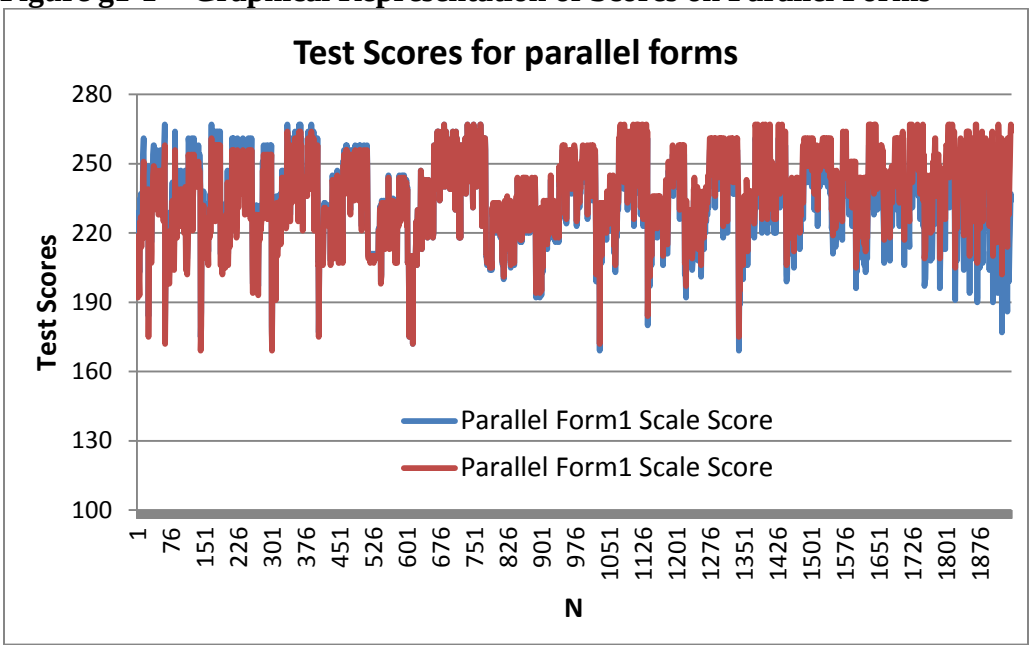
The items within the parallel forms contain comparable content to reflect the same construct. Examinees with similar ability taking the parallel forms of the tests should show comparable performance. The correlations listed in Table g1-1 are estimates of parallel reliability of scores between the two alternative forms taken by the same examinees. The data below shows the correlations of scores across alternate forms of the test in the ECS Reading Assessments. Examinees who tested with the parallel forms at a maximum interval of ten days and scored within the accurate range of each test form are included in the analysis. The overall test score correlation of the 1,946 examinees who tested with the parallel forms are .79 i.e. over 62 percent of the variation in performance on one parallel form of the test can be accounted for by scores on the other parallel form of the test. Nearly 88 percent of the 1,946 examinees had a test score correlation of .93 excluding the 12 percent outliers. From the correlations, ranging from .75 to .88, a significant amount (56.93– 77.4 percent) of the variation in performance on one parallel form of the test can be accounted for by scores on the other parallel form of the test.

Table g1-1 Correlations between Parallel Forms

Reading Level				Parallel Forms
A	Correlation	0.88	0.94	11R-12R
N=119	% of N	100.0	95.0	
B	Correlation	0.80	0.91	13R-14R
N=204	% of Data	100.0	91.2	
C	Correlation	0.75	0.87	15R-16R
N=549	% of N	100.0	85.1	
D	Correlation	0.79	0.89	17R-18R
N=1,074	% of N	100.0	87.4	
All Data	Correlation	0.79	0.89	All parallel forms
N=1,946	% of N	100.0	87.7	

Figure g1-1 shows the examinees' score on the parallel form 1 in comparison to form 2.

Figure g1-1 Graphical Representation of Scores on Parallel Forms



Item g2 – The adequacy of the research design leading to the estimates of the reliability of the test

The empirical analyses listed in items g1 and g2 involved the collaboration of psychometric and data collection experts in the field of adult education. A detailed summary of the results of each study is included in Item g1.

The research designs for the parallel forms correlation and classification consistency studies each focused on the proper selection of the study population to ensure representation of the adult education population being served. Item g2i details the size of the population associated with the research designs, and g2ii presents the demographic characteristics of the population studied.

In the analyses presented in Item g1, CASAS used examinee data submitted by agencies that provide adult education services under WIA Title I and WIA Title II. CASAS is responsible for the collection and aggregation of these submissions via the TOPSpro™ (Tracking of Programs and Learners) software. The data collection process follows strict guidelines to ensure accuracy and uniformity. This begins with the training process for test administrators and scorers (See Item i4) and continues as the data – received by CASAS on a quarterly basis – is then subject to rigorous data quality checks.

The research designs for each study take into consideration and can be described by five "elements" of research design: observations or measures, treatment or programs, groups, assignment to group, and time (Trochim, 2006). The layout design for the empirical data analyses generally follows the example outlined in Table g2-1 and Figure g2-1.

Table g2-1 Research Design Summary for Parallel Forms Correlation Analysis

Observations/Measures:

The first measure is the test score for examinees who took a test during a given program year(s). The second measure is the score on the parallel test form given to examinees within five days of the date that they took the first test.

Treatment or Programs:

There is the possibility of instruction between the two tests; however, the study is designed to limit this as much as possible by allowing a maximum of only five days between the two tests.

Groups:

The data is grouped into four subgroups: examinees taking CASAS level A, B, C, and D test forms.

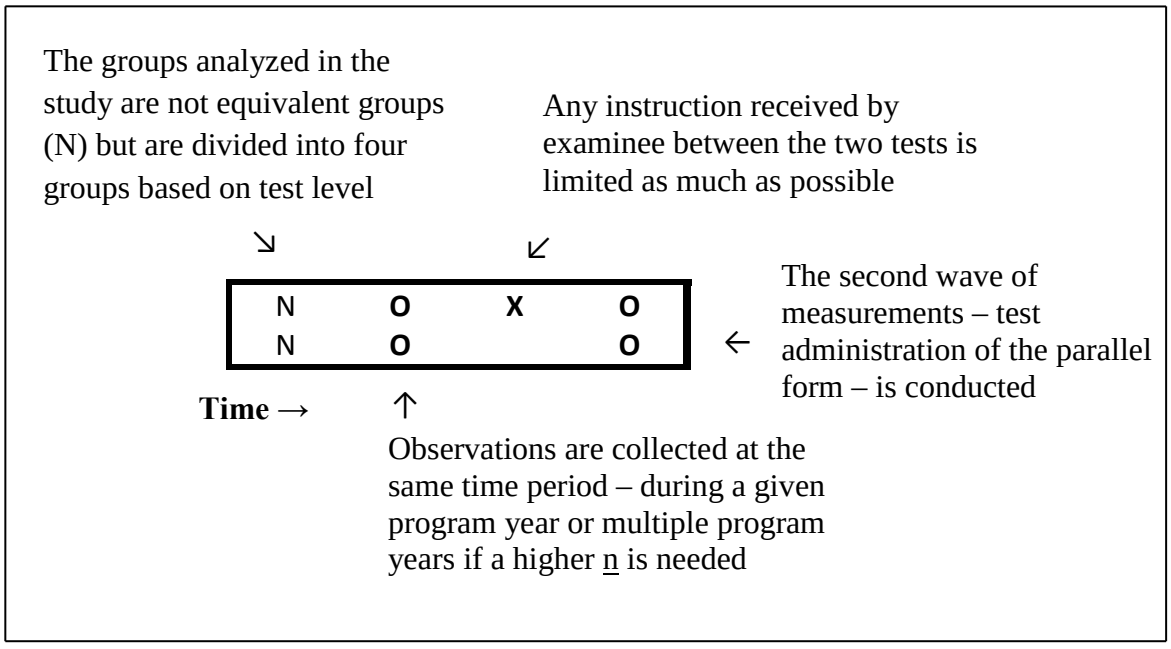
Assignment of Groups:

The four groups are not equivalent (N) and are assigned form levels.

Time:

Time moves from left to right in Figure g2-1 showing that once the groups are identified, the learning gains (difference between test one and test two) are then calculated and analyzed.

Figure g2-1 Research Design Notation for Parallel Forms Correlation Analysis



In addition, when conducting analyses such as those included in Item g1, psychometric experts review all data to determine if further controls are necessary based on the specific data analysis. For the purpose of these analyses, any exams with scores that did not fall in the accurate range with a

CSEM less than 5.6 (see Item d2) were eliminated. The access to this robust dataset from a complete population of examinees, collected based on the strict standards and procedures that CASAS follows, allows for a high level of confidence in the results.

CASAS continually conducts research related to reliability of ECS Reading Assessments. CASAS regularly updates analyses, such as the Parallel Form Reliability and Classification Consistency, as part of its continuous reliability measures to ensure that the assessments remain reliable over time. The analysis presented in Item g1 are from 2005-06 program year data.

(g2i) The size of the samples;

Table g2i-1 includes the sample sizes for the Parallel Forms and Classification Consistency analyses.

Table g2i-1 Sample Sizes for Reliability Analyses

Study	N
Parallel Forms	1,946

(g2ii) The similarity between the sample(s) used in the data collection and the adult education population

For comparison purposes, Table g2ii-1 includes the demographics characteristics for the Parallel Forms and Classification Consistency analyses.

Table g2ii-1 Demographic Characteristics for Reliability Analyses

Study	Examinees	Gender		Ethnicity				Years of Education		Language	
	N	Male	Female	White	Hispanic	Asian	Black	6 and below	7 and higher	English	Non English
Parallel Forms	1,946	193	1,753	699	630	35	495	97	1,846	186	1,760

(g2iii) The steps taken to ensure the motivation of the examinees

The correlation between parallel forms and classification consistency by NRS functioning level use actual aggregated student pre- and post-test data test data administered during the course of regular classroom instruction and assessment. Examinees who did not score in the accurate score ranges on both parallel forms were not included in the analysis.

Item g3 – Any other information explaining the methodology and procedures used to measure the reliability of the test

Table g3-1 shows the mean score, standard deviation, Item reliability, the KR-20 reliability and the empirical reliability for the ECS series. The Item reliability and the KR-20 estimates are produced by analyzing data using the Winstep software. The most popular estimator of raw-score reliability is the

Kuder-Richardson 20 (KR-20), a special case of Cronbach's Alpha. As a measure of internal consistency reliability, the KR-20 is the average inter-item correlation among items in the form.

Reliability means "reproducibility of relative measure location". "High reliability" (of persons or items) means that there is a high probability that persons (or items) estimated with high measures actually do have higher measures than persons (or items) estimated with low measures.

Table g3-1 Reliability Summary Statistics

ECS Reading Forms	No. of Items	N	Mean Scale Score	Standard Deviation	Alpha	KR-20	Items Reliability		Empirical Reliability (Bilog)
							Real	Model	
11 R	25	2,672	197.62	11.70	0.88	0.90	0.98	0.98	0.87
12 R	25	2,671	196.76	11.43	0.88	0.90	0.98	0.98	0.75
13 R	34	8,450	216.52	12.30	0.92	0.92	0.95	0.96	0.90
14R	34	9,158	216.08	12.00	0.91	0.91	0.96	0.96	0.86
114R	34	616	215.58	11.82	0.90	0.90	0.97	0.98	0.89
213	34	238	209.22	9.31	0.83	0.83	0.95	0.95	0.84
214	34	189	209.12	9.69	0.85	0.85	0.93	0.94	0.87
15 R	38	14,780	225.19	9.23	0.86	0.86	0.95	0.95	0.85
16 R	38	15,621	227.61	10.63	0.89	0.89	0.95	0.95	0.86
116R	38	1,623	227.25	9.73	0.86	0.86	0.99	0.99	0.84
17 R	30	10,548	242.63	10.74	0.85	0.86	0.96	0.96	0.85
18 R	30	10,557	243.13	11.12	0.86	0.87	0.96	0.97	0.79
215	36	211	226.36	10.22	0.86	0.86	0.93	0.94	0.86
216	36	164	227.31	10.25	0.86	0.86	0.91	0.92	0.86

During test (assessment) development CASAS checks for both, a high person (test) reliability and high item reliability making sure that the person sample have a large ability range and the test with a wide item difficulty range. Usually low item reliability is because the person sample size is too small to establish a reproducible item difficulty hierarchy. If you have anchored values, then it is the item reliability of the source from which the anchor values emanate which is crucial. Low item reliability means that your sample is not big enough to precisely locate the items on the latent variable (Linacre, J.M. 2003).

The empirical reliability estimates is outputted using the Bilog software (method 1). The empirical reliability in each sample is given by that value for the true score variance divided by the score variance. The score variance is just the variance of the maximum likelihood scores in the sample.

With Rasch IRT models the test information function, a sum of all the item information functions, is a useful tool in measuring the reliability of a test. In general, test information functions tend to look bell-shaped. A highly discriminating test would have a tall narrow information function which indicates that it contributes a large amount of information but over a narrow range. A less

discriminating test would have a flatter but wider information function which indicates that it provides less information but over a greater range. Figures g3-1 through g3-14 include test information functions for each of the ECS Reading forms. The test information functions for the parallel test forms in the ECS Reading Assessments are nearly identical in size, form, and structure showing a high degree of consistency between the parallel test forms. The peak of the test information functions is similar for the parallel test forms.

Figure g3-1 Test Information Function – Form 11

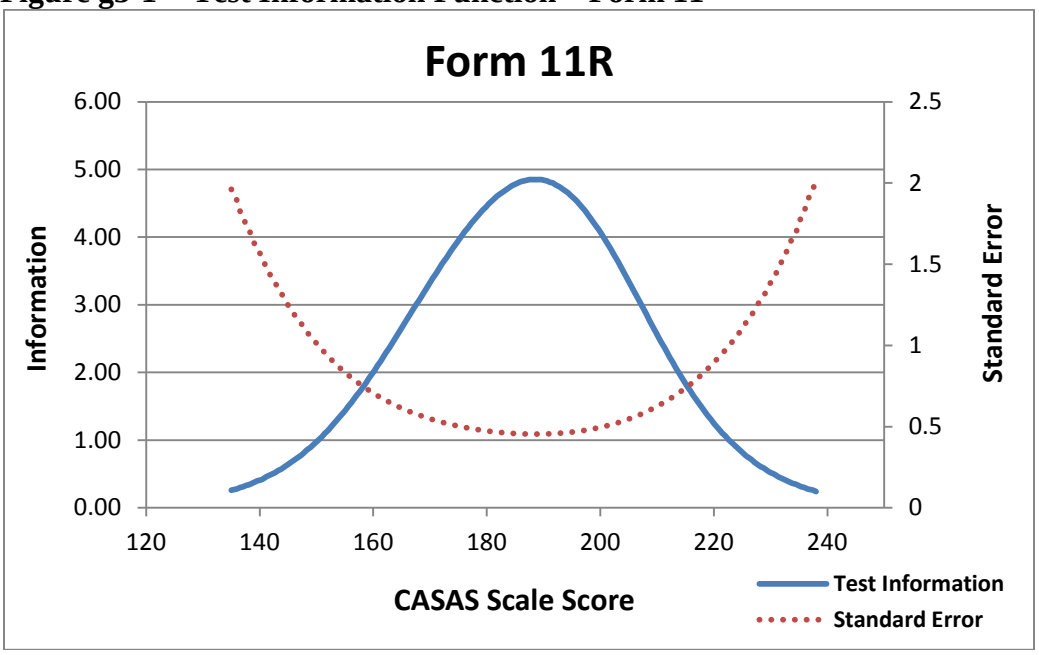


Figure g3-2 Test Information Function – Form 12

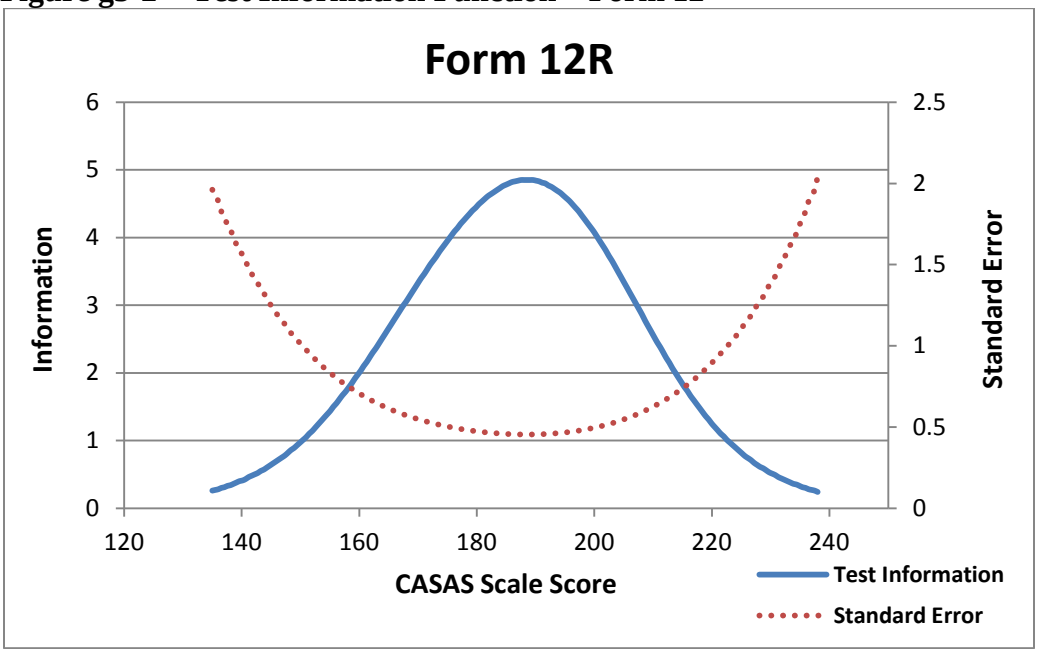


Figure g3-3 Test Information Function – Form 13

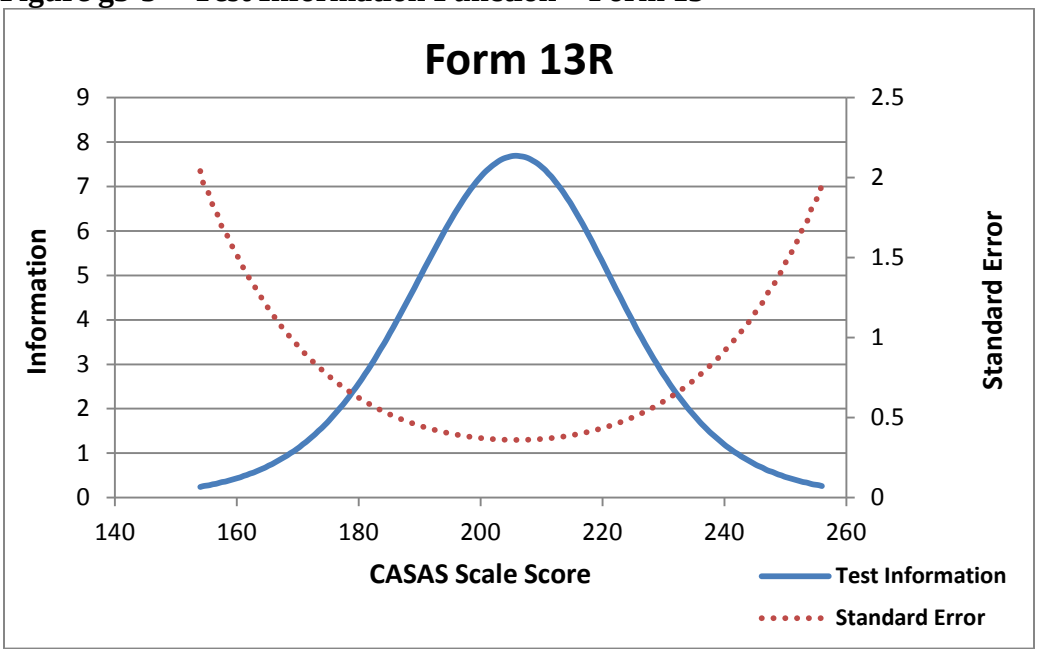


Figure g3-4 Test Information Function – Form 14

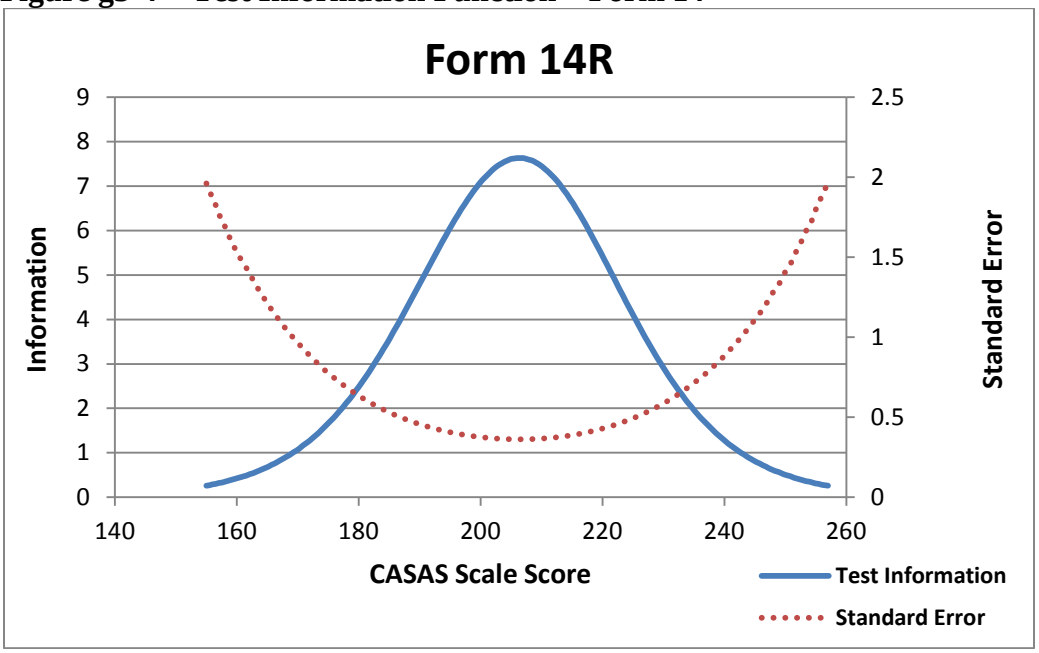


Figure g3-5 Test Information Function – Form 114

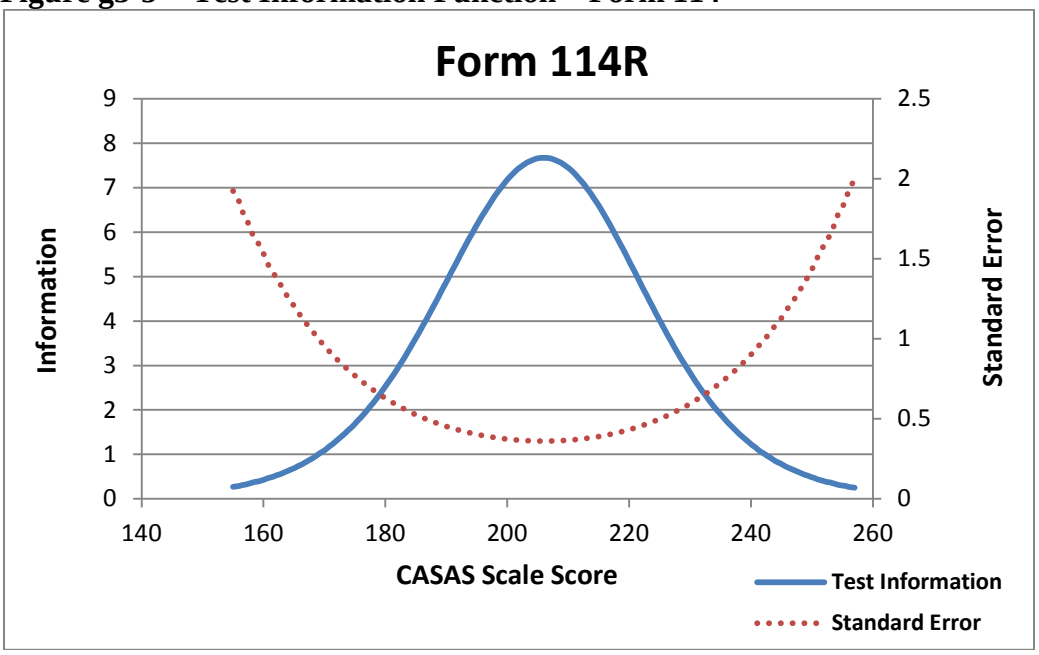


Figure g3-6 Test Information Function – Form 213

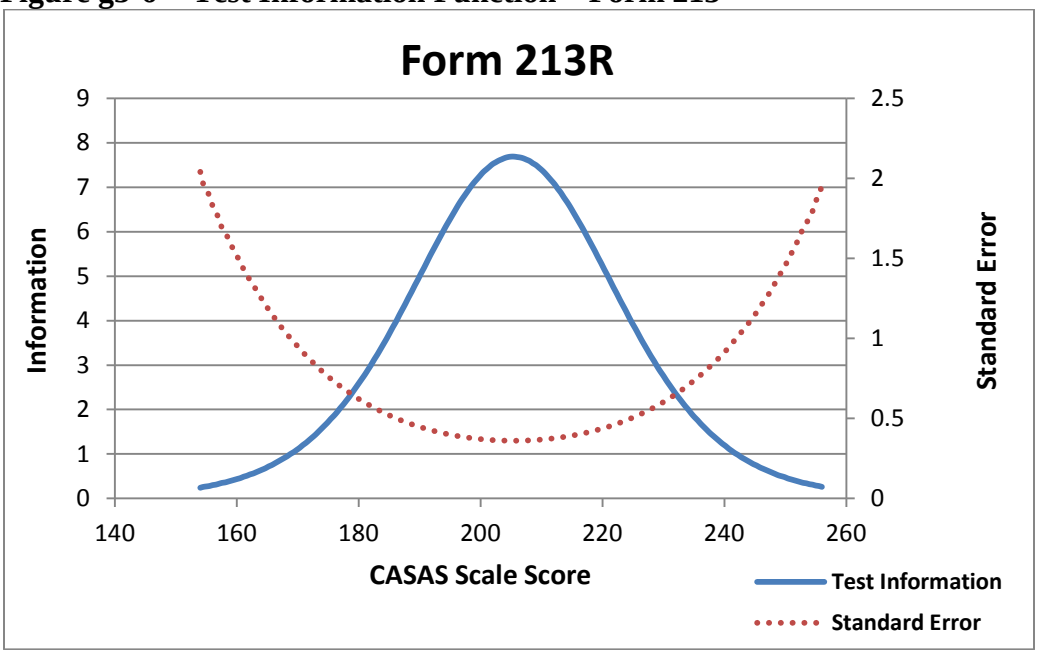


Figure g3-7 Test Information Function – Form 214

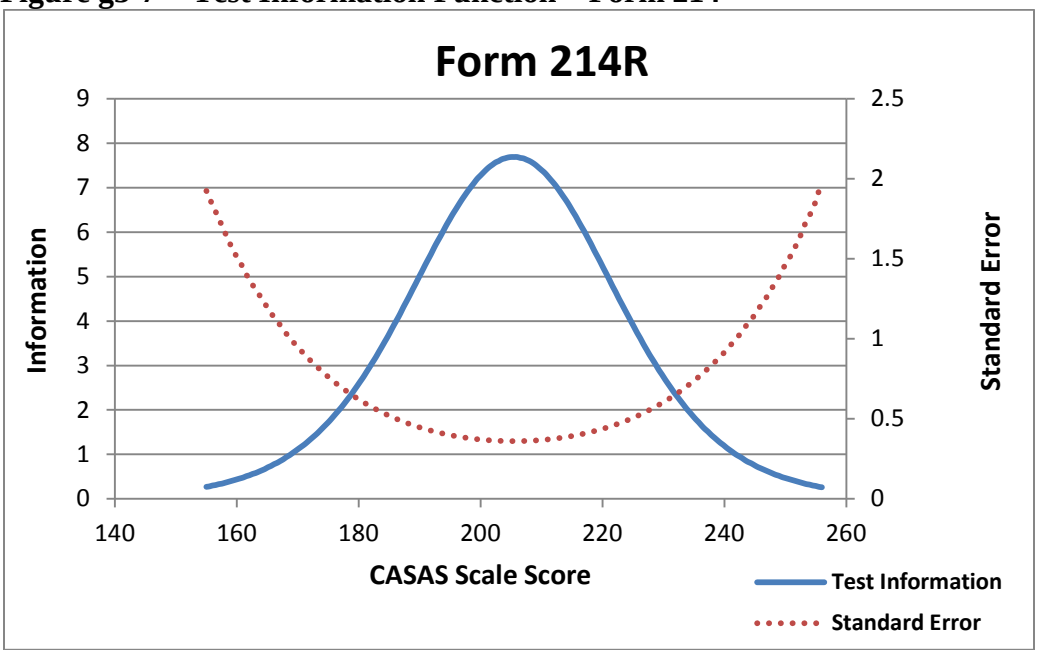


Figure g3-8 Test Information Function – Form 15

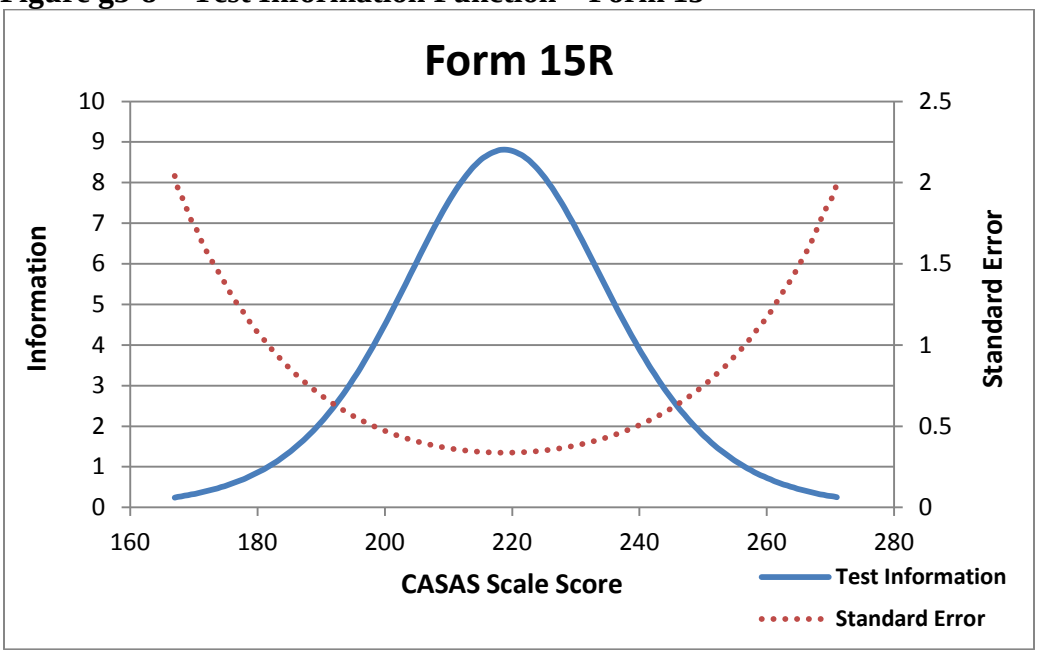


Figure g3-9 Test Information Function – Form 16

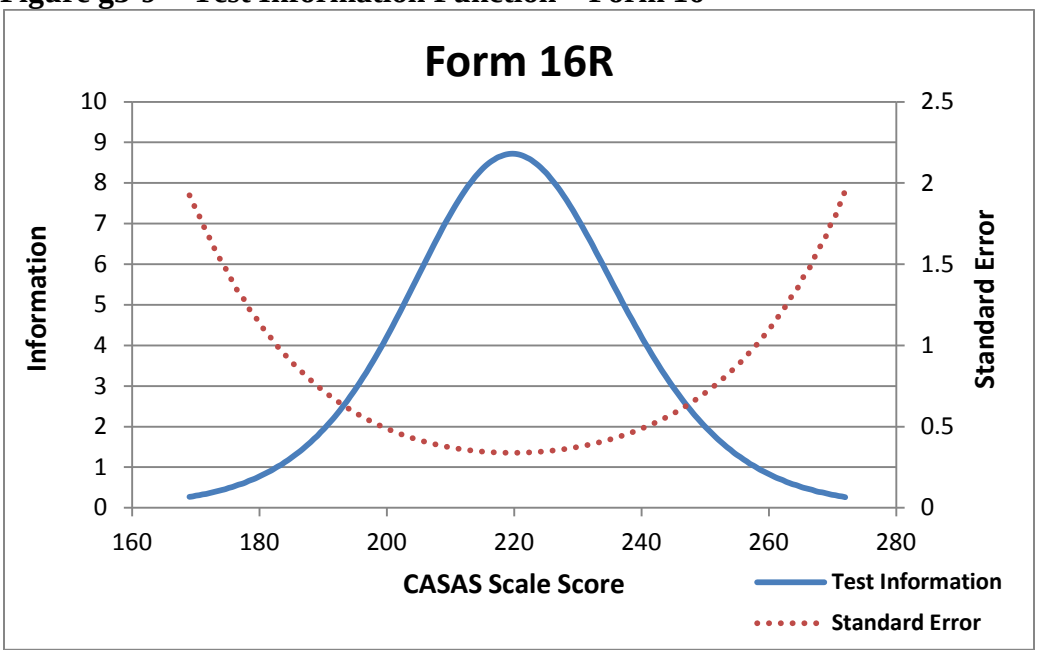


Figure g3-10 Test Information Function – Form 116

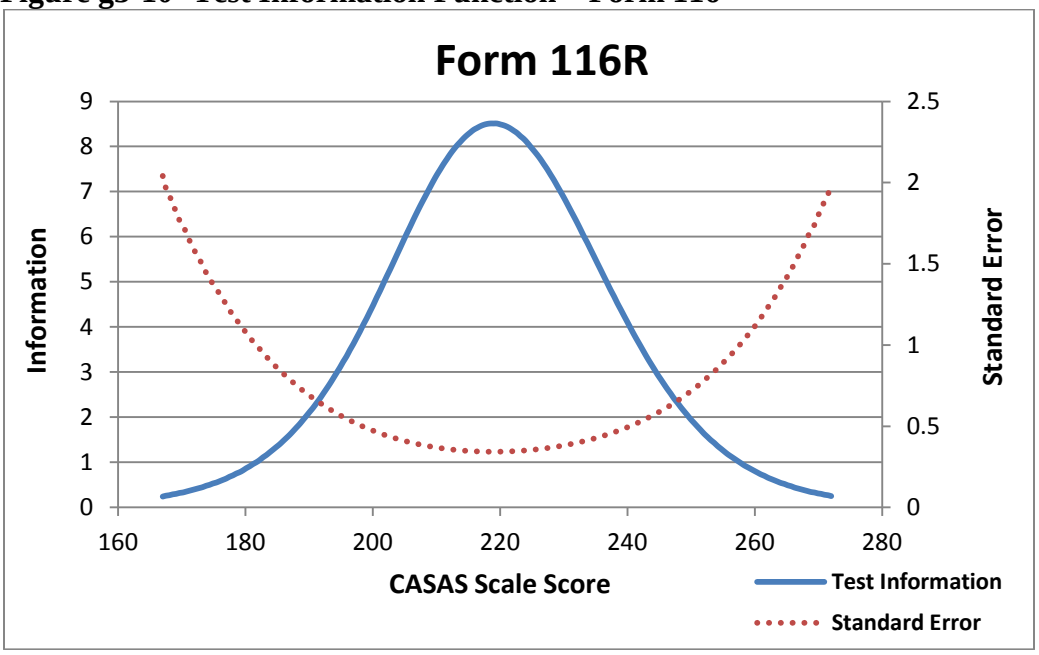


Figure g3-11 Test Information Function – Form 215

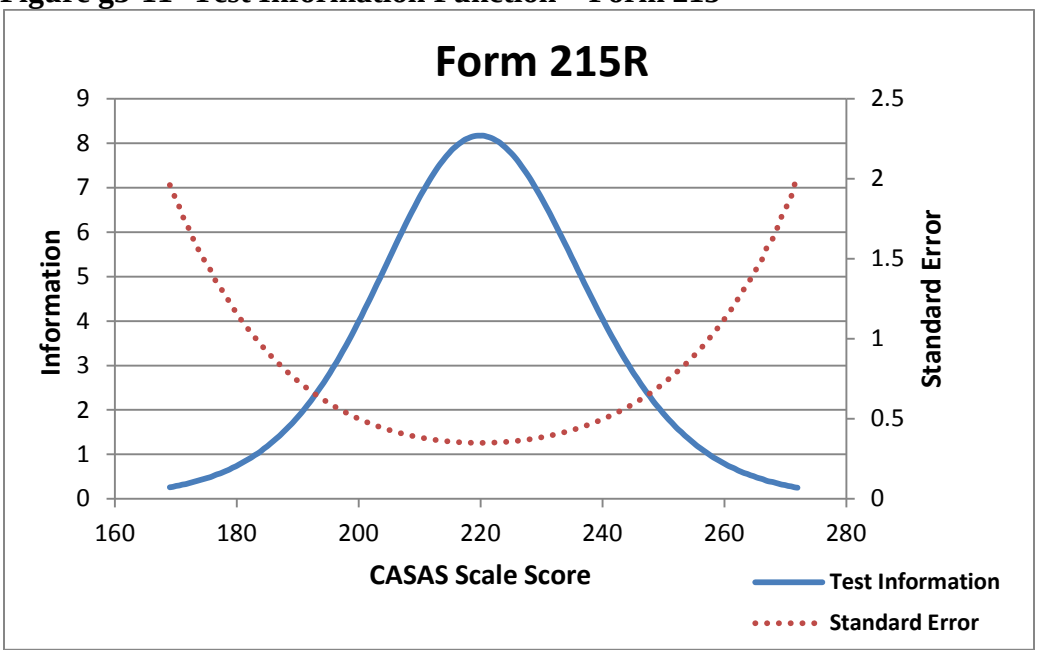


Figure g3-12 Test Information Function – Form 216

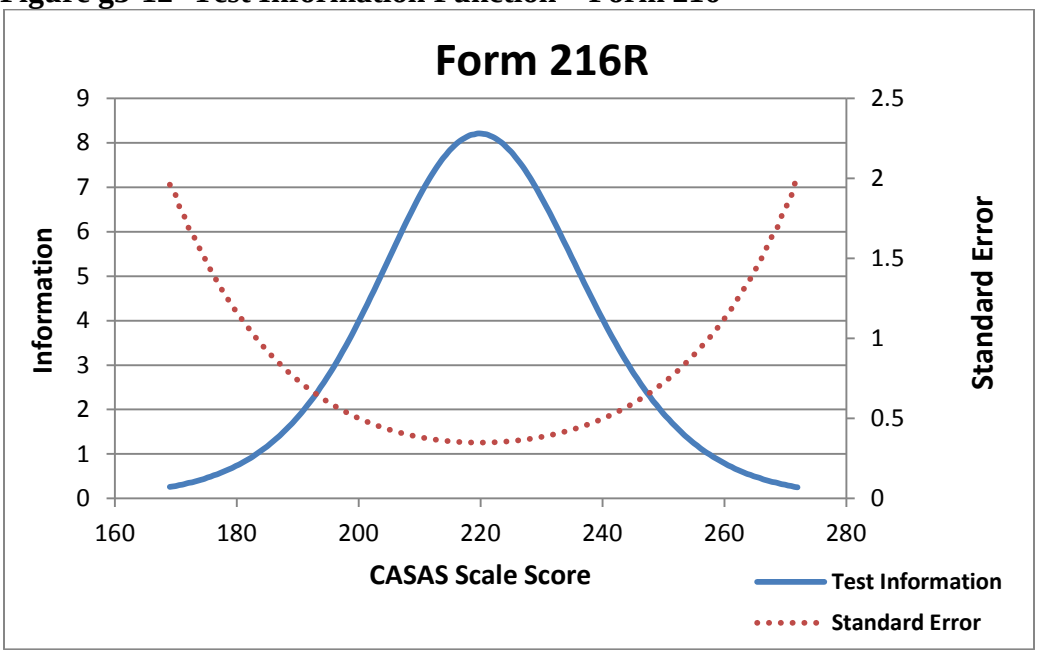


Figure g3-13 Test Information Function – Form 17

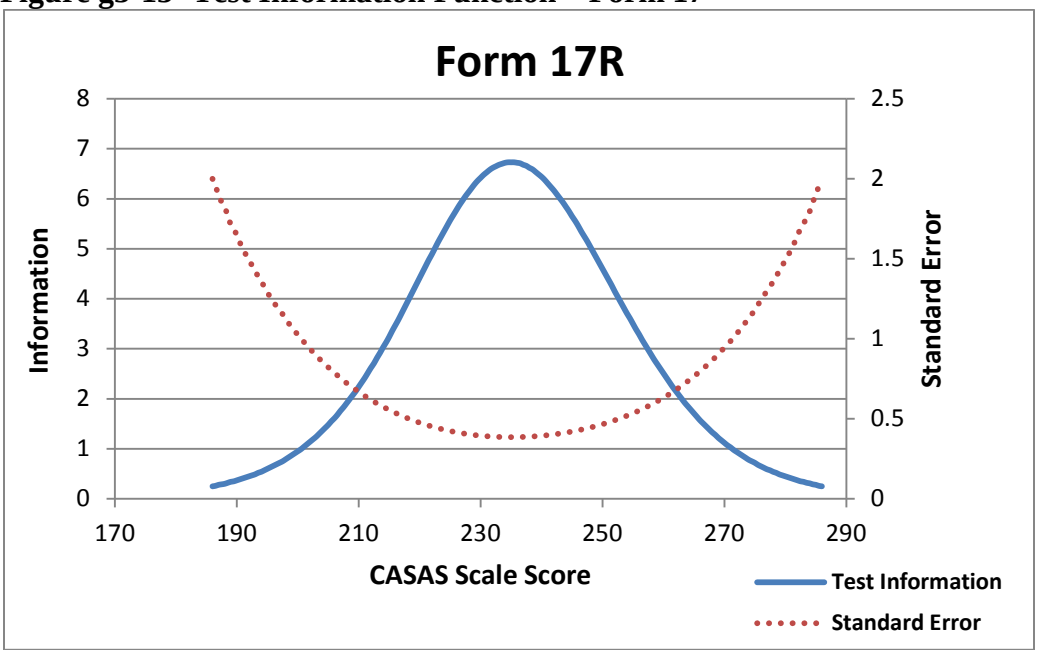
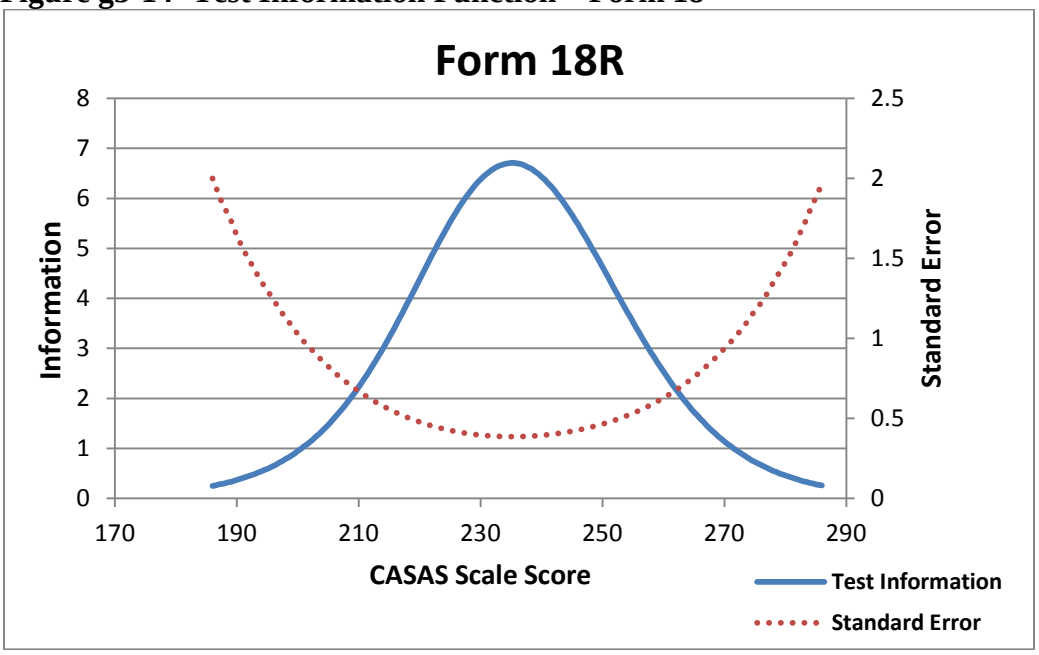


Figure g3-14 Test Information Function – Form 18



As part of the continuing reliability, CASAS is currently conducting Livingston's Coefficient of decision consistency. This is the proportion of score variance surrounding the cut score that is due to true score variance. The higher the value, the more reliable is the positioning of scores on one side or the other of the cut point.

$$K^2(X,T) = \frac{\sigma_x^{\,2}(KR20) + (\mu_x - n_i C)^2}{\sigma_x^{\,2} + (\mu_x - n_i C)^2}$$,where $KR20 = \alpha$, $\sigma_x^{\,2}$ = variance of test scores, μ_x =mean of test scores, and C=criterion level cut score for the test.

One computation for each relevant cut score. Either KR20 or alpha reliability can be used in the formula. The results of this analysis will be reported in the next edition of the technical manual.

(h) Construct Validity. Documentation of the appropriateness of a given test for measuring educational gain for the NRS, i.e., documentation that the test measures what it is intended to measure, including—

Item h1 – The extent to which the raw or scale scores and the educational functioning classifications associated with the test correlate (or agree) with scores or classifications associated with other tests designed or intended to assess educational gain in the same adult education population as the NRS

Relationship between CASAS and Student Performance Levels (SPL)

In the middle 1980s the Center for Applied Linguistics (CAL) convened a national group of experts in the field of teaching ESL to refugee adults to identify behavioral objectives related to standardization of student performance levels (SPLs). They provided general descriptions of adult refugee learners' language ability at a range of levels and a common reference standard for refugee programs nationwide. This group also served as a vehicle to facilitate understanding of a student's modality abilities within and between ESL programs. These performance levels, along with sufficient instructional contact hours, were generally described as necessary in order to move from one student performance level to the next.

The first draft of the CAL document was field-tested by seven Mainstream English Language Training (MELT) demonstration projects nationally. Two of the projects included in the field-test were also members of the CASAS Consortium, the San Diego Community College District and the San Francisco Community College District.

Each demonstration project assigned learners a performance level in two areas of language proficiency domains, language/oral communication and reading/writing. Individual SPL ratings were made by relating existing local program instructional levels to the SPL descriptions and then assigning SPLs to learners in the same instructional level.

Early studies that helped to develop the classification levels used by CASAS were developed with the San Diego Community College District during this same period. Data were collected from instructors in 46 ESL classrooms among four satellite locations, averaging 20 to 25 learners per class. Instructors were asked to identify the MELT level of each individual learner based on classroom performance in reading and listening comprehension. The results were matched to CASAS achievement scores to produce the criterion ranges described in Table h1-1.

Table h1-1 Relationship between CASAS and MELT

CASAS SCORES	MELT LEVEL	POSSIBLE PROGRAM PLACEMENT	MELT DESCRIPTION
165-180	I	ESL Pre-Literate Orientation	Functions minimally, if at all, in English.
181-190	II	ESL Beginning (Level 1)	Functions in a very limited way in situations related to immediate need.
191-200	III	ESL Beginning (Level 2)	Functions with some difficulty in situations related to immediate needs.
201-208	IV	ESL Intermediate (Level 1)	Can satisfy basic survival needs and a few very routine social demands.
209-215	V	ESL Intermediate (Level 2)	Can satisfy basic survival needs and some limited social demands.
216-224	VI	ESL Advanced (Level 1)	Can satisfy most survival needs and limited social demands.
225+	VII	ESL Advanced (Level 2)	Can satisfy survival needs and routine work and social demands.

The Basic English Skills Test (BEST) is an individually administered oral communication and literacy test that can be used to determine the SPL of adult refugees or immigrants. Each of the SPLs describes what a person at that proficiency level can do in terms of listening, speaking, reading, and writing. It also includes an overall statement of an individual's general language ability, including a description of the kind of employment a person would be able to handle based on assessed language performance.

In 1985 these SPL descriptions, along with the CASAS achievement scale, provided a sound basis for articulating instructional program levels. The relationship among the SPLs, the literacy items of BEST, and the CASAS reading tests are shown in
Table h1-2.

Table h1-2 Relationship among SPL Levels, BEST Scores, and CASAS Scores

SPL Levels	BEST scores	CASAS Scores
0	0 - 2	< 165
1	3 - 7	165 - 185
2	8 -21	186 - 190
3	22 - 35	191 - 200
4	36 - 46	201 - 208
5	47 - 53	209 - 216
6	54 - 65	217 - 223
7	> 65	224 - 231

During the late 1990s staff from the CAL and CASAS worked together to review and update the education level mapping between SPL and CASAS levels in order to ensure that the National Reporting System (NRS) skill level descriptors used for reporting learning gains to the U.S. Department of Education were accurate and reflected the most current information.

Relationship between CASAS and Other National Reference Scales

The relationship among CASAS levels and score ranges of the National Reporting System (NRS) levels, National Adult Literacy Survey (NALS) levels, Student Performance Levels (SPL), Work Keys levels, and years of schooling completed is provided in Table h1-3.

Table h1-3 Relationship among CASAS, NRS*, NALS, SPL***, Work Keys, and Years of School Completed**

CASAS Levels	CASAS Score Ranges	NRS Levels and Names for ABE	NRS Levels and Names for ESL	NALS Levels	SPL Levels	Work Keys Levels	Years of School Completed
A	180 and below		1 Beginning ESL Literacy	1	1	Below 3	1 to 2
A	181 – 190		2 Low Beginning ESL	1	2	Below 3	1 to 2
A	191 – 200	1 Beginning ABE Literacy	3 High Beginning ESL	1	3	Below 3	1 to 2
B	201 – 210	2 Beginning Basic Education	4 Low Intermediate ESL	1	4	Below 3	3 to 5
B	211 – 220	3 Low Intermediate Basic Education	5 High Intermediate ESL	1	5	Below 3	6 to 7
C	221 – 235	4 High Intermediate Basic Education	6 Advanced ESL	1/2	6	3	8 to 10
D	236 – 245	5 Low Adult Secondary Education		2/3	7	4	11 to 12
E	246 and above	6 High Adult Secondary Education		3	8	4	>12

* National Reporting System (WIA Title II)
** National Adult Literacy Survey
*** Student Performance Levels

Relationship between CASAS and GED 2002

The relationship of CASAS to the 2002 official GED Test was examined using data from California, Iowa, Oregon, Kansas, and Hawaii (n = 4,801). In this study CASAS reading and math scores along with official GED test results were collected from the participating states. All individuals had been administered the appropriate CASAS test form within six months of taking the GED test. The sample of adult learners in this study was restricted in range because of the fact that many agencies are reluctant to allow learners to take the GED until they are very likely to pass. However, a clear monotonic increasing relationship was found between CASAS reading scores and GED reading scores. Also, a similar relationship was found between CASAS reading scores and overall GED results averaged across the five test content areas. (Criteria for passing the GED is a minimum of 410 in each area and an average of at least 450 across the five areas). Results of this study appear in Tables h1-4 through h1-6. Table h1-4 shows the relationship between CASAS mean reading test scale scores and the GED reading scores. Table h1-5 shows the relationship between CASAS mean reading test scale scores and the GED total scores across the five content areas. Table h1-6 shows the relationship between CASAS mean reading test scale scores and the mean GED reading scores at each NRS educational functioning level as determined by score on a CASAS reading test.

Table h1-4 CASAS Reading Mean Test Scores Associated with GED Reading Score Ranges

GED Reading Score Range	CASAS Reading Test Mean	N	CASAS S.D.
≤400	234	530	9.90
401-425	237	282	8.93
426-449	238	380	10.76
450-476	239	671	9.54
477-494	240	523	10.64
495-510	242	403	10.14
511-524	243	247	11.09
525-540	244	247	9.69
541-556	244	211	9.33
557-576	244	101	8.39
577-600	244	308	9.82
601-638	246	263	9.77
≥639	247	635	9.79

Table h1-5 CASAS Reading Mean Test Scores Associated with GED Total Score Ranges

GED Total Score Range	CASAS Reading Test Mean	N	CASAS S.D.
≤425	231	205	9.40
426-449	235	264	8.83
450-476	237	449	9.35
477-494	239	403	9.01
495-540	242	322	9.23
511-524	243	286	10.36
525-540	244	304	10.01
541-556	245	276	10.03
557-576	246	277	9.91
577-600	247	233	10.51
601-638	248	247	9.51
≥639	250	197	10.93

Table h1-6 Mean Reading GED Scores by NRS Educational Functioning Level and CASAS Reading Scale Score Ranges

NRS Educational functioning levels		CASAS Reading Scale Score Ranges	GED Reading Score	
			N	Mean
1	Beginning ABE Literacy	200 and below	2	--
2	Beginning Basic Education	201-210	36	446
3	Low Intermediate Basic Education	211-220	116	443
4	High Intermediate Basic Education	221-235	1,220	471
5	Low Adult Secondary Education	236-245	1,676	508
6	High Adult Secondary Education	246 and above	1,751	557

CASAS-CAHSEE Readiness Exams

The field test results of the CAHSEE Readiness Test for the English Language Arts (ELA) is presented here as evidence of the strength of the construct of reading assessments and items in the CASAS item bank.

CASAS has developed an exam to assist WIA Title II adult education agencies in determining the readiness of their learners to take the California High School Exit Examination (CAHSEE). During the development process of this exam, CASAS field tested a readiness exam for the English Language Arts (ELA) sections of the CAHSEE. Participating adult education agencies administered the CAHSEE Readiness field tests to examinees one week prior to the CAHSEE exam. The ELA readiness field test was comprised of nearly an equal number of CASAS and CAHSEE questions.

At the end of the field test process, the database included 480 examinees who took both sections of the CAHSEE ELA Readiness Exam. Of these 480 examinees, 224 also took the actual CAHSEE. The results of the field test showed a correlation of .81 between the score on the field test items taken from CASAS reading tests and those that were practice items from the CAHSEE. These results indicate a strong internal correlation between the performance on the CASAS items and the CAHSEE practice items.

The correlation between the score on the CAHSEE Readiness Test and the actual CAHSEE was .78. This indicates a strong relationship between performance on the CASAS-CAHSEE Readiness ELA Exam as a whole and actual the CAHSEE scores achieved by the learners. These preliminary results are summarized in Table h1-7.

Table h1-7 CASAS-CAHSEE Readiness Preliminary Correlation Results

	Correlation	N
CASAS ELA Items and CAHSEE ELA Practice Items	0.81	480
CASAS ELA Items and Actual CAHSEE ELA Reading Score	0.78	224

UK NARIC Study

In 2008 the UK NARIC published a study titled *National and International Benchmarking of WDA Workplace Literacy and Numeracy Qualifications*. A portion of this study, which provides information on how the CASAS Levels compare with other international tests, is presented in this section. Although these tests measure a variety of populations that may extend beyond the populations served by the National Reporting System (NRS), CASAS deemed the comparisons from this study, although international in scope, as informative regarding the construct validity of CASAS assessments.

One purpose of the study was a level comparison of qualifications using the Common European Framework of Reference for Languages (CEFR) to other qualifications and measures. Excerpts of this portion of the study are reproduced and summarized below. Please note that this information is taken directly from the study; therefore, the reader will see the use of British English.

The comparisons include the following measures and qualifications:

- Singapore WP Literacy – An assessment system in place in Singapore to test workplace literacy in English.
- Cambridge International English Language Testing System (IELTS) – The IELTS qualification is designed to assess the language ability of candidates who need to study or work where English is the language of communication. IELTS is recognised by universities and employers in many countries, and is also recognised by professional bodies, immigration authorities and other government agencies. The IELTS qualification scores are often used to provide an indicator of the readiness of a candidate to enter higher education.
- The Business Language Testing Service (BULATS) – BULATS is a service for companies designed to help them find out the level of language skills among their staff, trainees or job applicants. The test assesses language skills which are needed for the workplace and for students and employees on language courses. A benchmarking process has been designed to help identify the needs of different clients.

BULATS is an examination based qualification benchmarked to the framework provided by CEFR. Competency statements, which are derived from the ALTE project relating statements of language competency to social, work and study based contexts, underpin achievement in the BULATS qualification. Consequently, performance in the examination is not seen in terms of pass or fail, but as a reflection of what an individual is able to do within the social, work or study contexts.

- Testing of English for International Communication (TOEIC) –The TOEIC test measures the listening and reading comprehension skills of non-native speakers of English and is designed for use by organisations working in an international market where English is the primary language of communication. In December 2006 TOEIC introduced Speaking and Writing examinations to complete the full complement of language skills tested. TOEIC scores are often used by organisations to make employment decisions about selection, assignment to overseas posts, promotion, training needs and training effectiveness.

- Testing of English as a Foreign Language (TOEFL) iBT – The main objective of the TOEFL Internet Based Test (iBT) qualification is very similar to that of the IELTS qualification: to indicate the level of English Language proficiency for the achievement of other ends. This is principally focussed towards demonstrating language proficiency as an entrance requirement into further education. TOEFL iBT, consequently, is regarded as an academic proficiency indicator, a purpose that differs significantly from the purposes of the WPL series. There are further similarities between the TOEFL and the IELTS qualifications in that they are both regarded as examination focussed qualifications.

- Comprehensive Adult Student Assessment System (CASAS) – CASAS focuses on teaching and assessing basic skills in contexts that are relevant and important to adult learners. CASAS is approved and validated by the U.S. Department of Education and the U.S. Department of Labour to assess both native and non-native speakers of English. The CASAS system is backed up by 25 years of research and development in adult assessment, instruction and evaluation.

The CASAS listening modality measures the following: recognizing vocabulary, understanding imperatives, instructions, and requests, interpreting grammatical structures, understanding conversations, comprehending informational and factual discourse, and making inferences.

Table h1-8 (Table 27 in the UK NARIC Study) provides comparisons between the above mentioned organizations using CEFR as a benchmarking framework. The comparison demonstrates that the WPL and CASAS programs broadly compare to levels A1 to B2 on the framework. It also demonstrates that WPL caters to a level of language proficiency below the lowest CEFR level A1. This highlights a strength of the literacy series that starts at Level 1 for people who are barely literate, whereas CEFR A1 describes people with a basic awareness of a second language.
In relation to TOEIC and TOEFL, the table shows an inconsistent distribution of the qualification grades. It also emphasizes that the TOEFL and TOEIC scores cover a narrower band of CEFR, suggesting limitations on the value of these scores. Furthermore, with the TOEIC qualification the table shows that near maximum scores are required for the result to be considered comparable to CEFR C1. BULATS and IELTS relate well across all levels of the CEFR

Table h1-8 Table 27 from UK NARIC Study – English Language Qualifications Level Comparisons

	WP Literacy	CASAS *	IELTS	BULATS	TOEIC				TOEFL iBT				
					Minimum scores				Minimum scores				
					Listening	Reading	Speaking	Writing	Overall	Listening	Reading	Speaking	Writing
					5-495	5-495	0-200	0-200	0-120	0-30	0-30	0-30	0-30
CEFR C2			8 - 9	90-100							29		
CEFR C1			7 - 8	75-89	490		200	200	110-120	26	28	28	28
CEFR B2	8	E	6 - 7	60-74	400	385	160	150	87-109	21	22	23	21
CEFR B1	7	D	5 - 6	40-59	275	275	120	120	57-86	13	8	19	17
	6	C											
CEFR A2	5	B	4 - 5	20-39	110	115	90	70				13	11
	4												
CEFR A1	3	A	3 - 4	0-19	60	60	50	30				8	
	2	A											
	1												

* For a summary of the NRS Educational Functioning Levels and their equivalence to CASAS levels, refer to Item f3 of this document.

Item h2 – The extent to which the raw or scale scores are related to other relevant variables, such as teacher evaluation, hours of instruction, or other measures that may be used to test performance

Teacher Evaluation Study

To provide additional external evidence of construct validity, CASAS conducted a concurrent validity study. The goal of this study was to determine the degree to which the placement of examinees into NRS Educational Functioning Levels based on independent teacher evaluations compared to scores achieved on the CASAS Reading assessments. The use of the teacher evaluations can be interpreted as an independent measure of students' abilities on the same construct measured by CASAS assessments.

For the purposes of this study, CASAS requested the participation of teachers across a variety of adult education classes. Special attention was taken to choose classes of all levels so that the sample population consisted of students who spanned all six of the NRS Educational Functioning Levels and from a variety of forms covering the Reading assessment series.

The study took place during the middle of the instructional year so that teachers would have sufficient knowledge of their students' ability. Also, the timing of the study was specifically chosen to coincide with a CASAS testing administration so that students would have recently taken a CASAS test and been placed into a corresponding NRS Educational Functioning Level. It was important that the teachers' judgments were proximate with the assessment, so the estimates of students' abilities were at similar times.

Teachers were educated on the descriptions of the NRS Educational Functioning Levels. In general, teachers' familiarity with these levels was very limited. Because of this limitation, CASAS researchers noted that more advanced training regarding the NRS Educational Functioning Levels might be beneficial for future studies.

Teachers were then asked to place each student into an NRS Educational Functioning Level based solely on their knowledge of students' abilities without consideration of construct irrelevant factors (e.g., motivation, behavior, attendance). If a teacher did not have sufficient contact with a student, they were asked not to evaluate that student. Teachers were specifically instructed to make their evaluation without seeing the score the student had recently achieved on their CASAS test or the corresponding NRS Educational Functioning Level in which this placed them. The goal was to receive teacher evaluations that were not influenced by, and therefore independent of, students' test scores.

The background and demographic information of the participating teachers is listed in Tables h2-1 through h2-5.

Table h2-1 Teacher Evaluation Study – Participating Teachers' Background

Title, Degree(s), Certification(s)	N	%
BA/BS	10	27.0
MA/MS	13	35.1
ESL Instructor	1	2.7
Teacher	3	8.1
Multiple Subject Teaching Credential	1	2.7
Adult Ed. Credential (Designated Subjects)	2	5.4
ABE/GED Instructor	1	2.7
Non-Credit Instructor	1	2.7
Special Education Credential	1	2.7
ABE Teacher, Multi Subject Certification w/Bilingual BCLAD & TESOL Certif.	1	2.7
No Response	3	8.1
Total	37	100.0

Table h2-2 Teacher Evaluation Study – Participating Teachers' Teaching Experience

Years Adult Education Teaching Experience	N	%
<5	7	18.9
5-10	10	27.0
11-15	6	16.2
16-20	6	16.2
21-25	2	5.4
26-30	3	8.1
No Response	3	8.1
Total	37	100.0

Table h2-3 Teacher Evaluation Study – Participating Teachers' Gender

Gender	N	%
Female	23	62.2
Male	10	27.0
No Response	4	10.8
Total	37	100.0

Table h2-4 Teacher Evaluation Study – Participating Teachers' Age

Age	N	%
< 35	4	10.8
35-45	9	24.3
46-59	14	37.8
60+	6	16.2
No Response	4	10.8
Total	37	100.0

Table h2-5 Teacher Evaluation Study – Participating Teachers' Race/Ethnicity

Race/Ethnicity	N	%
White (Not Hispanic or Latino)	23	62.2
Hispanic or Latino	5	13.5
Asian	2	5.4
Black or African American	4	10.8
No Response	3	8.1
Total	37	100.0

Tables h2-6 and h2-7 provide evidence of the agreement, defined as classification consistency, between NRS Educational Functioning Level placement by teachers and by CASAS test scores.

For future studies, CASAS is designing new training methods that will be used to ensure that teachers are adequately trained on the descriptions of each NRS Educational Functioning Level. This includes allotting more time to this process. In addition, we feel it is important to train teachers to be aware of a possible tendency to use construct irrelevant factors (e.g. behavior, attendance, effort) to evaluate student ability.

Table h2-6 provides the mean CASAS test scale scores by ABE/ASE NRS Level that was assigned through teacher evaluation. For example, for all ABE students that were assigned an NRS Level of Low Intermediate Basic Education by teachers, the mean CASAS test score was 214.1. These results suggest that the teachers, on average, were able to classify students into categories that were also differentiated by their observed scores.

Table h2-6 Mean CASAS Test Scale Scores by NRS Level Assigned via Teacher Evaluation (ABE/ASE)

NRS ABE/ASE Educational Functioning Level	Mean CASAS Test Score	N
Beginning ABE Literacy	--	1
Beginning Basic Education	192.8	13
Low Intermediate Basic Education	214.1	24
High Intermediate Basic Education	223.0	23
Low Adult Secondary Education	232.0	17
High Adult Secondary Education	--	1

Note. Mean scores less than 10 are not reported.

Table h2-7 provides the mean CASAS test scale scores by ESL NRS Level that was assigned through teacher evaluation. For example, for all ESL students that were assigned an NRS Level of High Beginning ESL by teachers, the mean CASAS test score was 208.2. Similar to the results observed in Table h2-7 above, the teachers were generally able to classify students into NRS levels that also demonstrated differences in their observed CASAS scores.

Table h2-7 Mean CASAS Test Scale Scores by NRS Level Assigned via Teacher Evaluation (ESL)

NRS ESL Educational Functioning Level	Mean CASAS Test Score	N
Beginning ESL Literacy	175.5	63
Low Beginning ESL	195.8	82
High Beginning ESL	208.2	38
Low Intermediate ESL	212.5	82
High Intermediate ESL	218.4	130
Low Advanced ESL	224.4	71

CASAS to Years of Schooling and Degree

A study addressing predictive validity issues was conducted in Iowa in 1996. This study, *A Workforce Basic Skills Norming Study of Iowa's JTPA and PROMISE JOBS Target Populations*, comprised 819 JTPA and/or PROMISE JOBS participants from 11 of the 15 community college programs. Data were collected using the ECS Appraisal Form 130 and analyzed to establish evidence of relationships to educational level and to develop accurate and reliable score cut-off points for various educational, certification, and career goals. Results showed a strong correlation between the ECS test scores and various

educational levels. Table h2-8 below shows the relationship between highest grade completed and ECS reading mean scores.

Table h2-8 Iowa Population Mean Scale Scores by Highest Grade Completed

Highest Grade Completed	Number	%	Reading
8 or less	97	12	229 *
9	107	13	233 ±
10	114	14	235 ±
11	118	15	237 *
12	288	35	241 *
13+	86	11	245

* Statistically significant different from subsequent level at the .05 level.
± Statistically significant difference from the second subsequent level at the .05 level

The results presented in Table h2-8 demonstrate that while CASAS scale scores are not precise equivalents for grade levels completed, there is a clear correlation between the two, and that CASAS scale scores in reading on the ECS Series do translate to higher grade levels completed. In Table h2-8 it is also worth noting that the majority of the differences between CASAS means for a grade level completion are significant. Therefore, in general, participants who have more years of schooling score higher in reading, indicating a predictive relationship between the test scores and grade level completion.

Table h2-9 Iowa Population Mean Scale Scores by Highest Degree Earned

Highest Degree Completed	Number	% of sample	Reading	Math
None	380	48	232	219
High School	239	30	240	226
GED	121	15	243	228
Vocational/Technical	21	3	246	233
AA/AS	13	1	248	234

Table h2-9 demonstrates the relationship between highest degree completed and ECS reading and math mean scale scores. The data show that higher reading and math scores translate to higher degree completion rates. The differences between the means for no degree and all other noted degrees were significant at the .05 level, and differences between a high school diploma and all higher degrees (including GED) were significant as well.

An additional study compared ECS reading scale scores across the 14 test forms for examinees having six or fewer years of schooling and those examinees having seven or more years.

Table h2-10 Mean Pre-Test Scores by Years of Education Completed

Forms	Years Group	N	Mean	Standard Deviation	t Value	SIG.
11R	6 or less	788	195.2	11.9	7.699	0.00
	7 or more	1,683	199.1	11.2		
12R	6 or less	981	195.1	11.5	7.02	0.00
	7 or more	1,474	198.4	11.0		
13R	6 or less	1,142	210.9	11.6	17.862	0.00
	7 or more	7,010	217.8	12.0		
14R	6 or less	1,552	209.6	10.7	24.669	0.00
	7 or more	7,269	217.6	11.4		
114R	6 or less	101	212.6	11.6	3.705	0.00
	7 or more	465	217.2	11.3		
213R	6 or less	123	208.3	9.1	1.515	0.13
	7 or more	114	210.4	9.6		
214R	6 or less	95	205.4	8.6	5.761	0.00
	7 or more	93	212.9	9.3		
15R	6 or less	863	221.7	8.4	11.908	0.00
	7 or more	12,741	225.5	9.2		
16R	6 or less	1,192	223.3	10.0	15.583	0.00
	7 or more	13,485	228.2	10.5		
116R	6 or less	213	223.9	8.5	5.446	0.00
	7 or more	1,359	227.8	9.8		
215R	6 or less	117	226.5	9.2	1.179	0.24
	7 or more	93	225.1	10.7		
216R	6 or less	95	226.1	9.4	1.858	0.65
	7 or more	69	229.0	11.1		
17R	6 or less	253	238.3	10.2	6.606	0.00
	7 or more	10,002	242.8	10.7		
18R	6 or less	465	237.1	10.4	12.746	0.00
	7 or more	9,779	243.0	11.1		

Results of t-test comparisons between the two groups were consistent with earlier studies. Examinees who have had seven or more years of schooling demonstrated higher scale scores when compared to those having six or fewer years of schooling. The t-value and significance values on these forms provide evidence that we can reject the null-hypothesis that the mean scores are similar and accept the hypothesis that the means are

different for the two education groups analyzed. Form 215R was the only exception; the mean score for examinees with six or fewer years of education was slightly higher (226.5 vs. 225.1 and t-value of 1.18). The results of the statistical analysis by test level are shown in Table h2-10.

CASAS to Hours of Instruction

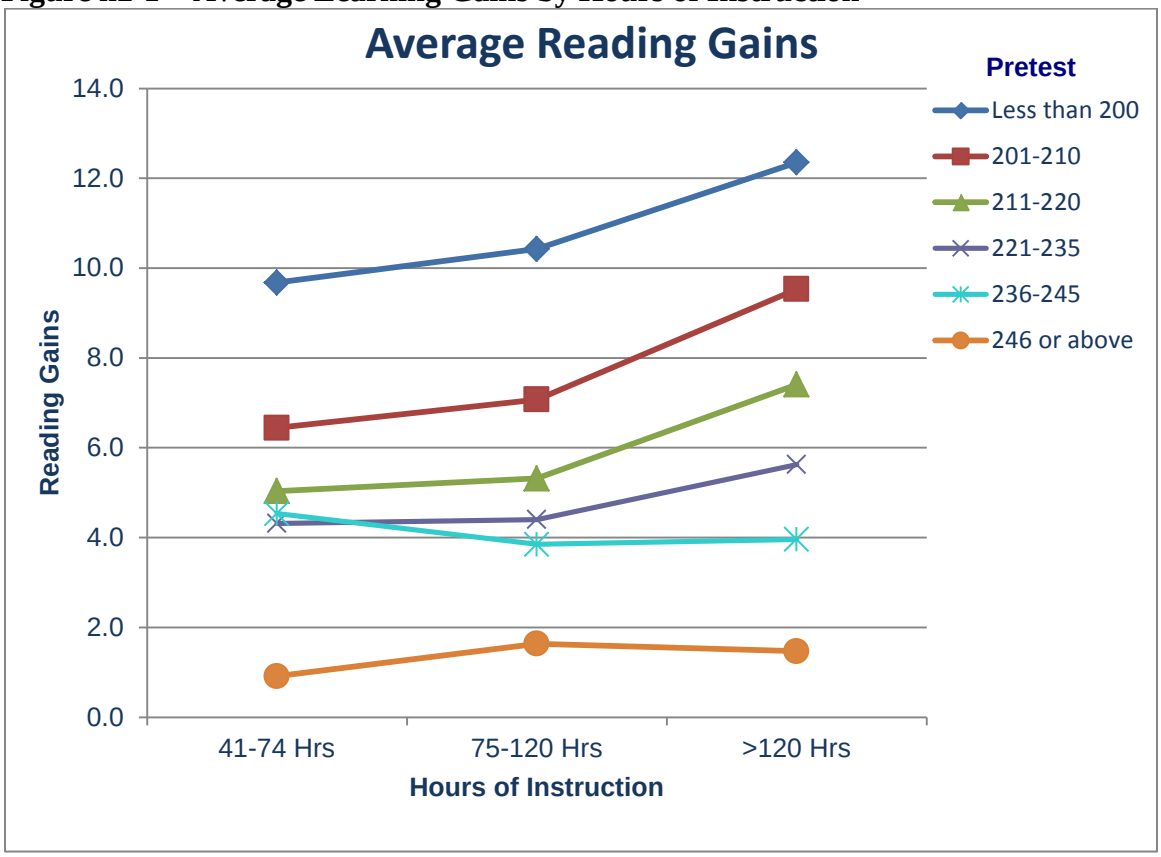
The study looked at the relationship between hours of instruction and learning gains. The data from this study represents three states: California, Iowa, and Oregon for the program year 2006-07. The data was collected for NRS Federal Table reporting purposes using TOPSpro software. There were 241,722 examinees with over forty hours of instruction who took a pre- and post-test using a CASAS reading assessment. The data represents all 12 NRS functioning levels. See Table h2-11.

Table h2-11 Study Population—Hours of Instruction and Learning Gains

	Learners with CASAS Reading Pre- and Post-test		
	Hours of Instruction		
Functioning Level	**41-74 Hrs.**	**75-120 Hrs.**	**>120 Hrs.**
ABE Beginning Literacy	377	365	1,880
ABE Beginning	596	711	2,192
ABE Intermediate Low	993	924	2,508
ABE Intermediate High	3,318	3,106	7,684
ASE Low	1,444	1,256	2,934
ASE High	878	651	1,715
ESL Beginning Literacy	1,503	1,682	3,535
ESL Beginning Low	3,001	3,448	7,435
ESL Beginning High	7,810	9,317	22,496
ESL Intermediate Low	13,121	16,922	44,706
ESL Intermediate High	5,601	7,693	24,213
ESL Advanced	5,091	7,386	23,230

Examinees who took a pretest and post-test on a CASAS reading assessment are grouped according to the hours of instruction: 41-74, 75-120, and above 121 hours. It is important to note that the study used the total hours of instruction within a program year as reported for the NRS Federal Tables for each student without consideration as to hours specifically devoted to reading instruction. Overall, Figure h2-1 shows a positive correlation between average gain and hours of instruction. The highest gains between pre- and post-test are seen at the lower levels. Additional research has shown that the positive relationship between hours of instruction and learning gains in the adult education program is mainly seen across instructional levels in the ESL program and does not always hold, especially at the high levels, in ABE and ASE programs. One hypothesis for this is that ESL classes often may have more structure and more consistent attendance patterns that are not completely captured by analyzing results by total hours of instruction. CASAS is conducting analyses to examine this relationship further.

Figure h2-1 Average Learning Gains by Hours of Instruction



Unidimensionality and Principal Components Factor Analysis

Fundamental to all IRT models is the notion that a test measures one and only construct. This is referred to as unidimensionality. The assumption is that the items in a test are homogenous and are measuring a single trait. One of the more common and early ways of testing this assumption was through criteria developed by Reckase (1979). Generally, these criteria related to the proportion of variance associated with the first eigenvalue and the ratio of the first to the second eigenvalue. The eigenvalue for a factor measures the variance in all the variables which is accounted for by that factor and the ratio of eigenvalues is the ratio of explanatory importance of the factors with respect to the variables. A factor with a low eigenvalue is contributing little to the explanation of variances in the variable. Thus, eigenvalues measure the amount of variance in the total sample accounted for by each factor. Eigenvalues are computed by summing the squared factor loadings (the correlation between the variable and the factor) for all the variables.

The procedure, proposed by Reckase, for assessing unidimensionality called for generating a tetrachoric inter-item correlation matrix and then conducting a principal components analysis to determine whether the first factor accounted for at least 20 percent of the total variance. See Table h2-12.

Table h2-12 Principal Components Factor Analysis

Form	Number of Items	Largest Eigenvalues 1	2	3	% of Variance First Factor	$\frac{\lambda^1}{\lambda^2}$
11R	24	7.58	1.93	1.10	31.58	3.92
12R	25	4.75	2.33	1.46	19.01	2.03
13R	34	9.92	1.78	1.17	29.18	5.57
14R	34	7.24	1.76	1.28	21.31	4.11
114R	34	8.41	1.59	1.42	25.00	5.28
213R	34	5.39	2.62	2.11	15.84	2.05
214R	34	6.37	2.41	1.95	18.74	2.64
15R	37	6.41	1.68	1.29	17.33	3.81
16R	38	6.88	1.45	1.15	18.11	4.74
116R	38	6.27	1.59	1.30	16.00	3.93
215R	36	6.69	1.72	1.62	8.60	3.88
216R	36	6.53	1.88	1.66	8.16	3.47
17R	30	6.13	1.37	1.11	20.46	4.47
18R	30	4.71	1.45	1.17	15.71	3.24

Results showed that the first principal component included the majority of the variance compared to the subsequent principal component extractions across the ECS Reading Forms. For example, for Form 11R, 31.6 percent of the variance can be accounted for by the first eigenvalue; and the first eigenvalue is much larger than the second eigenvalue (7.58 compared to 1.93 or a ratio of 3.92). These are indicators, among others, of an essentially unidimensional construct measurement.

Data from the combined math and reading forms were analyzed using principal components factor analysis. Each set of items was composed of both math and reading items in an adult life skills context. The math and reading item sets were also independently analyzed. Eigenvalues from each principal component were extracted from the data matrix and compared to determine the eigenvalue size and proportion of variance that was accounted for by each of the principal components.

The results also show that the percentage of variance accounted for by the first factor was greater for all forms when the reading and math items were analyzed separately than when they were treated as a single form. See Table h2-13 for information on the combined reading and math forms.

Table h2-13 Principal Components Analysis — Combined Forms

Form	No. of Items	Largest Eigenvalues 1	2	3	% of Variance of First Factor	λ^1 / λ^2
11	49	11.69	3.15	2.28	23.85	3.72
12	49	7.05	2.64	2.30	14.37	2.68
13	65	15.28	3.82	1.94	23.51	4.00
14	65	10.40	3.62	2.28	15.99	2.87
15	69	10.00	2.96	1.87	14.49	3.38
16	69	10.20	2.95	1.60	14.78	3.46
17	62	10.18	3.15	1.56	16.42	3.23
18	62	8.86	2.99	1.70	14.29	2.96

Item h3 – The adequacy of the research designs associated with these sources of evidence

The series of descriptive and empirical analyses listed in items h1 and h2 involved the collaboration of psychometric experts, subject matter experts, and data collection experts in the field of adult education. A detailed summary of the results of each study is included in items h1 and h2.

The research designs for each project focused on the proper selection of the study population to ensure adequate representation of the adult education population being served. Item h3i details the size of the study populations associated with the research designs, and Item h3ii presents the demographic characteristics of the study population. In the Relationships Between CASAS and MELT, Work Keys Study, and the CASAS-GED Correlation Study, multiple states participated in the studies, allowing for a broader representation of the entire adult education population.

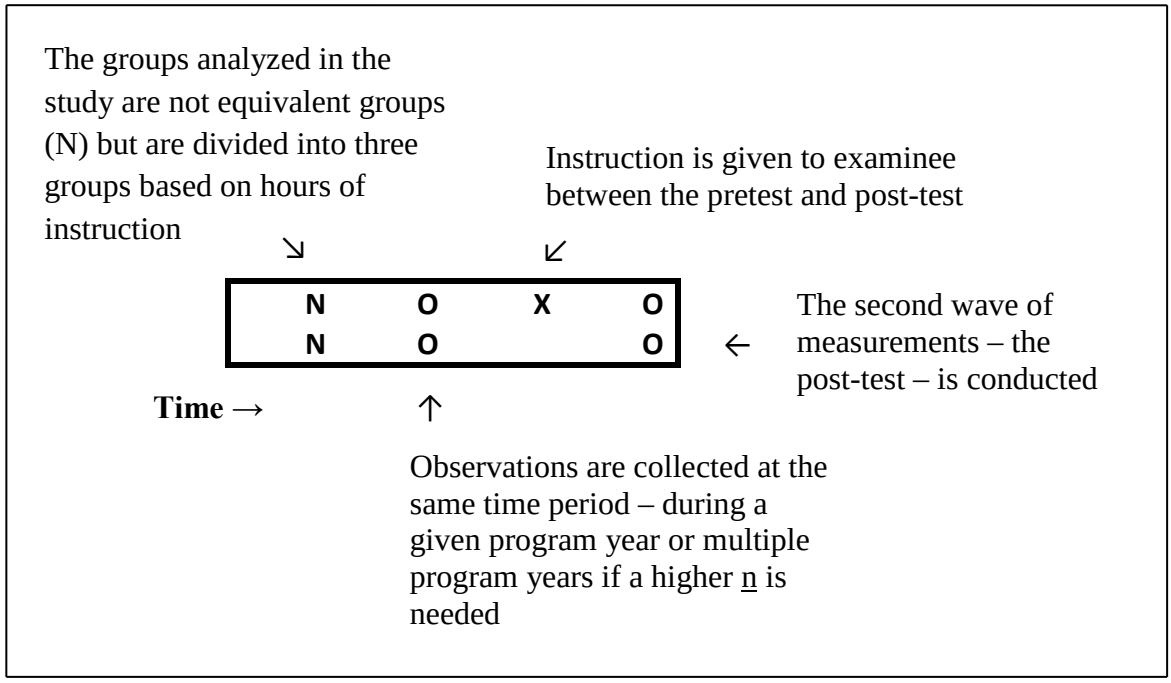
In the empirical analyses Mean Scale Scores by Years of Education, Mean Scale Scores by Hours of Instruction, and the Unidimensionallity and Principal Components Analysis, CASAS used data submitted by WIA Title II funded agencies from examinees, encompassing examinees in California during the 2004-05, 2005-06 and 2006-07 program years. CASAS is responsible for the collection and aggregation of these submissions via the TOPSpro™ (Tracking of Programs and Learners) software. The data collection process follows strict guidelines to ensure accuracy and uniformity. This begins with the training process on data collection requirements and techniques for test administrators and scorers, detailed in Item i4, and continues as the data received by CASAS is then subject to rigorous data quality checks. These data quality checks are based on the Data Quality Checklist published by the NRS. Examples include a comprehensive data dictionary provided to all local programs and the review of data on a quarterly basis using error checking functions that identify out-of-range values, anomalous, or missing data.

The research designs for each study take into consideration and can be described by five "elements" of research design: observations or measures, treatment or programs, groups, assignment to group, and time (Trochim, 2006). The layout design for the empirical data analyses generally follows the example outlined in Table h3-1 and Figure h3-1.

Table h3-1 Research Design Summary for Hours of Instruction by Learning Gains Analysis

Observations/Measures: The first measure is the pretest score for examinees who took a pretest during a given program year(s). The second measure is the post-test score for examinees given a post-test during the same program year(s). **Treatment or Programs:** The treatment is the instruction given between the pretest and post-test. **Groups:** The data is grouped into three subgroups: examinees with 41-74, 75-120, or 120+ hours of instruction between pre- and post-tests. **Assignment of Groups:** The two groups are not equivalent (N) and are assigned based on hours of instruction. **Time:** Time moves from left to right in Figure h3-1 showing that once the groups are identified, the mean learning gains are then calculated and analyzed.

Figure h3-1 Research Design Notation for Hours of Instruction by Learning Gains Analysis



Item and test form data is further reviewed by psychometric experts to determine if items and test forms conform to psychometric standards such as unidimensionality, inter-item consistency (KR 20), model fit, differential item functioning, standard errors of measurement, etc. When items do not appear to meet professional psychometric standards, they are reviewed again by psychometric and subject matter experts for possible elimination, revision, or retention of the items. After items are calibrated, reviewed, and included on test forms, a raw to scale score transformation is calculated and linked back to original scale. Only scale scores with a conditional standard error of measurement (CSEM) less than 5.6 are included in the accurate range of each test form (see Item d2).

In addition, when conducting analyses such as those included in Items h1 and h2, psychometric experts review all data to determine if further controls are necessary based on the specific data analysis. For the purpose of these analyses, any exams with scores that did not fall in the accurate range with a CSEM less than 5.6 (see Item d2) were eliminated. The access to this robust dataset from a complete population of examinees, collected based on strict standards and procedures that CASAS follows, allows for a high level of confidence in the results.

CASAS continues to conduct research related to construct validity. CASAS regularly updates analyses, such as the Mean Scale Scores by Years of Education, with current program year data and reviews its items and tests for item difficulty drift, bias, sensitivity, and current relevance. For analyses that are still in progress, such as the

CASAS-CAHSEE Readiness Study, additional data collection continues to further increase the reliability and validity of the results.

(h3i) The size of the samples

Table h3i-1 Construct Validity Research Studies Information

Study	Participants	Table
Teacher Evaluation Study	564 examinees and 37 teachers	h2-1 to h2-7
Relationships between CASAS and MELT	46 classrooms with 20-25 learners per class	h1-1
Relationship among SPL Levels, Best Scores, and CASAS Scores	810 learners	h1-2
Work Keys Study	494 learners from 27 sites across 8 states	h1-3
CASAS-GED Correlation Study	4,801 learners from five states	h1-4, h1-5, h1-6
CASAS-CAHSEE ELA Readiness Study	480 learners from 44 agencies (224 learners with actual CAHSEE scores)	h1-7
CASAS-IOWA Studies Examining Mean Scale Scores by Highest Degree Completed and Grade Level	774 learners	h2-8, h2-9
Mean Scale Scores by Years of Education	73,605 examinees	h2-10
Mean Scale Scores by Hours of Instruction	241,722 examinees	h2-11 and Figure h2-1
Unidimensionallity and Principal Components Analysis	77,498 examinees	h2-12, h2-13

(h3ii) The similarity between the sample(s) used in the data collection and the adult education population

As outlined in item h3i, several of the studies included participants from a wide variety of agencies and states to represent better the diversity of the adult education population.

For the Mean Scale Scores by Years of Education and the Unidimensionallity and Principal Components analyses, please refer to Table h3ii-1 reports overall demographic characteristics on the populations used in these analyses. The N may vary slightly when different controls are implemented, such as analyzing scores only in the accurate range and adding 2006-07 program year data to increase the sample size for specific forms. The demographic characteristics did not change significantly based on these additional controls.

Table h3ii-1 ECS and WLS Reading Examinee Information

ECS	No. of Items	Examinees	Gender		Ethnicity				Years of Education		Language	
Form	Reading	N	Male	Female	White	Hispanic	Asian	Black	6 and below	7 and higher	English	Non English
11	25	2,672	1,569	1,099	347	1,762	125	356	788	1,683	968	1,704
12	25	2,671	1,379	1,281	344	1,631	310	308	981	1,474	841	1,830
13	34	8,450	4,596	3,829	1,776	4,173	429	1,755	1,142	7,010	5,372	3,078
14	34	9,158	4,750	4,369	1,670	5,068	713	1,377	1,552	7,269	4,388	4,770
114	34	616	258	357	155	345	33	65	101	465	210	406
213	34	238	197	41	9	204	1	24	123	114	44	194
214	34	189	158	31	11	154	3	21	95	93	40	149
15	38	14,780	7,415	6,819	3,630	6,660	710	2,504	863	12,741	9,094	5,686
16	38	15,621	7,539	7,773	3,374	8,047	964	2,204	1,192	13,485	8,058	7,563
116	38	1,623	666	955	258	1,124	95	100	213	1,359	466	1,157
215	36	211	210	1	14	145	6	43	117	93	80	131
216	36	164	163	1	12	115	1	33	94	69	63	101
17	30	10,548	6,963	3,496	3,438	3,937	409	2,258	253	10,002	8,156	2,392
18	30	10,557	6,166	4,282	3,067	4,504	571	1,867	455	9,779	7,196	3,361
Total		77,498	42,029	34,334	18,105	37,869	4,370	12,915	7,969	65,636	44,976	32,522
%			54.2	44.3	23.4	48.9	5.6	16.7	10.3	84.7	58.0	42.0

(h3iii) The steps taken to ensure the motivation of the examinees

When field tests were administered, the test administration directions were provided and reviewed with participating agencies. Item 2 from the Field-test Administration Directions specifically states:

> Explain to learners that we are making a new reading test. Today we are going to find out how well the test works and if the questions are right for your level.

Prior to administration of the test forms, administrators emphasized to the examinees the importance of doing their best on the test and answering the questions to the best of their ability, but not to guess at answers just to finish the test. Test administrators explained to examinees the important role they play in the creation of a new test.

Other analyses, such as the CASAS-GED Correlation Study, the CASAS-IOWA Study Examining CASAS Scale Score and Grade Level, the CASAS-IOWA Study Examining

Mean Scale Scores by Highest Degree Completed, and the Mean Scale Scores by Years of Education Study were conducted as continuing validity studies and use actual aggregated student pre- and post-test data administered during the course of regular classroom instruction and assessment.

Item h4 – Other evidence demonstrating that the test measures gains in educational functioning resulting from adult education and not from other construct irrelevant variables such as practice effects

Additional construct-related analyses were needed to determine if the ECS Reading Assessments were adequately measuring only the intended construct.

Confirmatory Factor Analysis

The ECS Reading Assessments include both math and reading problem solving item scores. Data from the ECS Reading Assessments were analyzed using confirmatory factor analysis to determine if the combined reading and mathematics item scores were better fit with a one-factor model or a two factor model. The one-factor model hypothesized a single construct of adult life skills problem solving for the combined reading and math item scores. The two-factor model evaluated separate constructs for the reading and math item scores. Multiple statistical indicators of model fit were computed to measure the goodness of fit of the one- and two-factor models.

The Goodness of Fit Index (GFI) is a measure of the proportion of variance and covariance that the hypothesized model is able to explain, while the Adjusted Goodness of Fit Index (AGFI) considers the degrees of freedom in computing the measure. The Root Mean Square Residual (RMR) is an average of the residuals between observed and estimated input matrices. The Root Mean Square Error of Approximation (RMSEA) is a comparative fit measure that reflects the extent that the proposed model does not fit the data. In summary, for the GFI and AGFI, a higher index shows a better fit to the model. For the RMR and the RMSEA, a lower index shows a better fit to the model.

Table h4-1 provides results from the confirmatory factor analysis for the odd numbered forms in the ECS series. These results show that for the ECS Series the hypothesized two factor model (separate reading and math construct item score factors) has a consistent better fit to the empirical score data than the one-factor model (hypothesizing a common factor or construct for adult life skills problem solving but not differentiated into the reading and math groups).

Table h4-1 Confirmatory Factor Analyses

Form N Factors Reading and Math	GFI One	GFI Two	+/-	AGFI One	AGFI Two	+/-	RMR One	RMR Two	+/-	RMSEA One	RMSEA Two	+/-
11	.76	.86	+.10	.74	.89	+.15	.12	.08	-.04	.08	.09	+.01
13	.45	.68	+.23	.41	.66	+.25	.11	.07	-.04	.14	.09	-.05
15	.58	.81	+.33	.55	.80	+.25	.07	.05	-.02	.10	.06	-.04
17	.86	.90	+.04	.85	.90	+.05	.09	.08	-.01	.05	.04	-.01

Raw Score Correlation Analysis

To examine further evidence of construct validity, the correlation between ECS Reading and ECS Math scores was analyzed. The study group consisted of all examinees who took both an ECS Reading form and an ECS Math form from the same level (for example, a ECS Reading Form 11 and Math Form 11). Table h4-2 provides the mean raw combined score (the sum of the mean reading score and mean math score), the standard deviation, and the correlation between the math and reading raw scores. Of the eight correlations between the math and reading raw scores that were run for this analysis, only one was above .60. The results provide evidence that the math and reading adult life skill items were not measuring the same construct.

Table h4-2 Raw Score Correlation Analysis

ECS Forms	# of Reading Items	# of Math Items	N	Combined Math and Reading Mean Score	Combined Standard Deviation	Correlation
11	25	24	97	25.4	8.82	0.66
12	25	24	114	26.9	7.63	0.41
13	34	31	1,501	34.0	13.44	0.47
14	34	31	850	36.2	12.37	0.38
15	38	31	2,639	43.8	12.77	0.58
16	38	31	1,982	41.9	12.97	0.53
17	30	32	1,513	32.5	12.39	0.57
18	30	32	922	30.5	10.54	0.38

Parallel Form T-Test Analysis

Additional evidence of construct validity is provided from the results of the Parallel Form T-Test Analysis. For this analysis, the same group of examinees was used as in the Correlation between Parallel Forms Analysis reported under requirement g1. This dataset consisted of examinees who were assessed with each of two parallel forms within a

specified time period. The purpose of this analysis was to determine if the mean scores achieved by these examinees on each of the two parallel forms were significantly different.

For the purpose of this analysis, the parallel form administrations were divided into two random groups, so that the test-taking patterns were comprehensive and did not always measure the same administration pattern (for example, to ensure that the first comparison group did not always reflect examinees taking Form 11 and the second group did not always reflect examinees taking Form 12).

The results, comparing the mean scale scores, show low t-values. This provides evidence that we can accept the null hypothesis that the mean scores on parallel test forms at each CASAS test level are not significantly different. These results appear in Table h4-3.

Table h4-3 Parallel Forms T-Test Results

CASAS Test Level	Mean Group 1	Mean Group 2	N	T-Value	Sig.
A	200.5	200.6	61	-0.275	0.785
B	221.4	221.0	114	0.794	0.429
C	232.5	232.9	196	-0.771	0.442
D	247.4	246.5	97	1.449	0.151

(i) Other Information

Item i1 – A description of the manner in which test administration time was determined, and an analysis of the speededness of the test

Test Administration Times

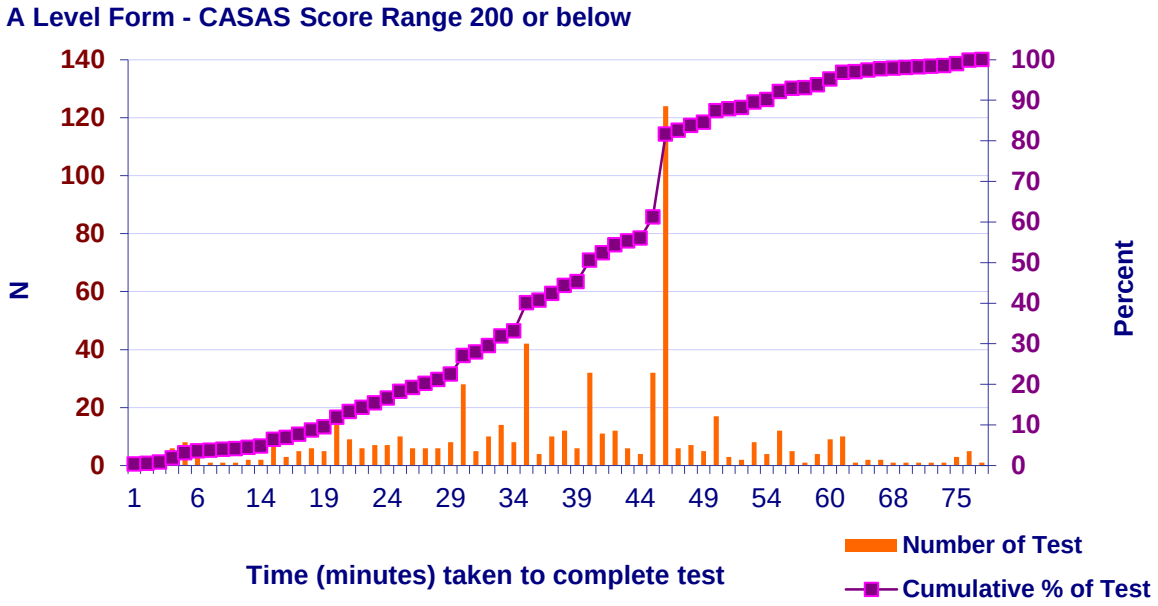
There is no time limit for the ECS Reading Assessments, but most examinees finish within one hour. From October to December 2007, CASAS conducted a study to analyze the relationship between test-taking time and student performance. Participating test administrators volunteered to record the amount of time examinees took to complete their assessments by writing the beginning and ending times and then recording the total test-taking time on the answer sheets. The answer sheets were then scored and a correlation analysis was run between test-taking time and test score. The results, summarized in Table i1-1, showed no significant correlation between test-taking time and the scores achieved. Typically examinees with lower ability took longer to finish the test and, hence, a negative correlation is expected.

Table i1-1 Test Taking Time and Student Performance — Correlation Analysis

Form Level	CASAS Scale Score	Total Number of Test N	Correlation between test score & time
A	200 or Below	609	0.035
B	201-220	478	-0.115
C	221-235	649	-0.181
D	236-245	544	-0.153

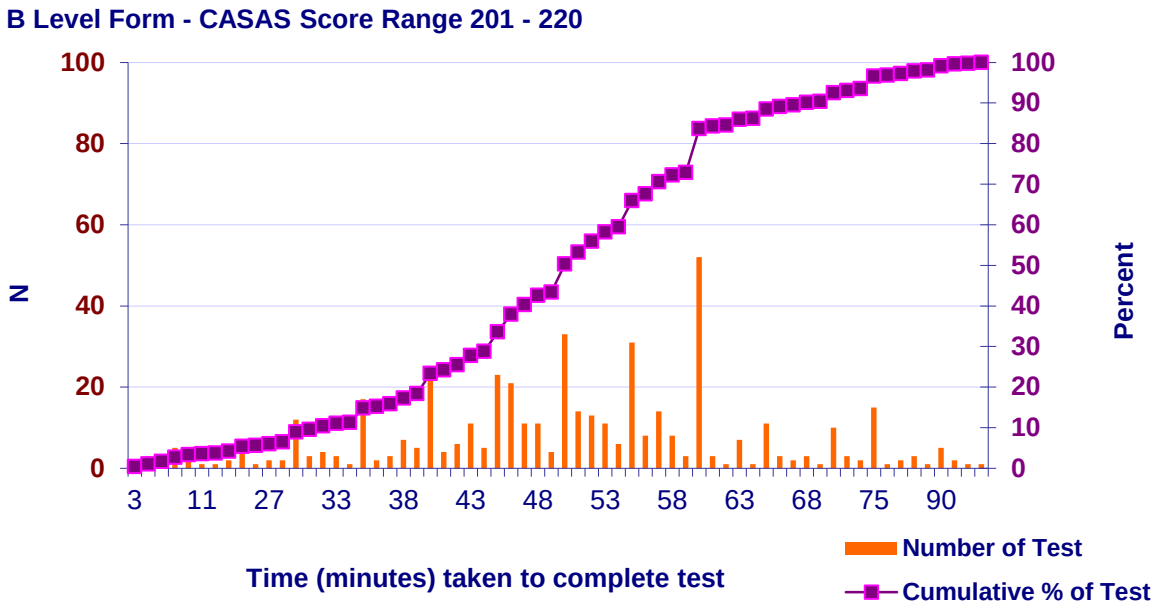
Figures i1-1 through i1-4 display the distribution of the total number of minutes to complete the test. Nearly 82 percent of 609 examinees who were administered an A level form took 46 minutes or less to complete the test. The cumulative percent is shown on the secondary X axis.

Figure i1-1 Test Taking Time for A Level Forms



Nearly 84 percent of 478 examinees who were administered a B level form took 60 minutes or less to complete the test.

Figure i1-2 Test Taking Time for B Level Forms



Eighty percent of 649 examinees who were administered a C level form and 80 percent of 544 who were administered a D level form took nearly 60 minutes or less to complete the test.

Figure i1-3 Test Taking Time for C Level Forms

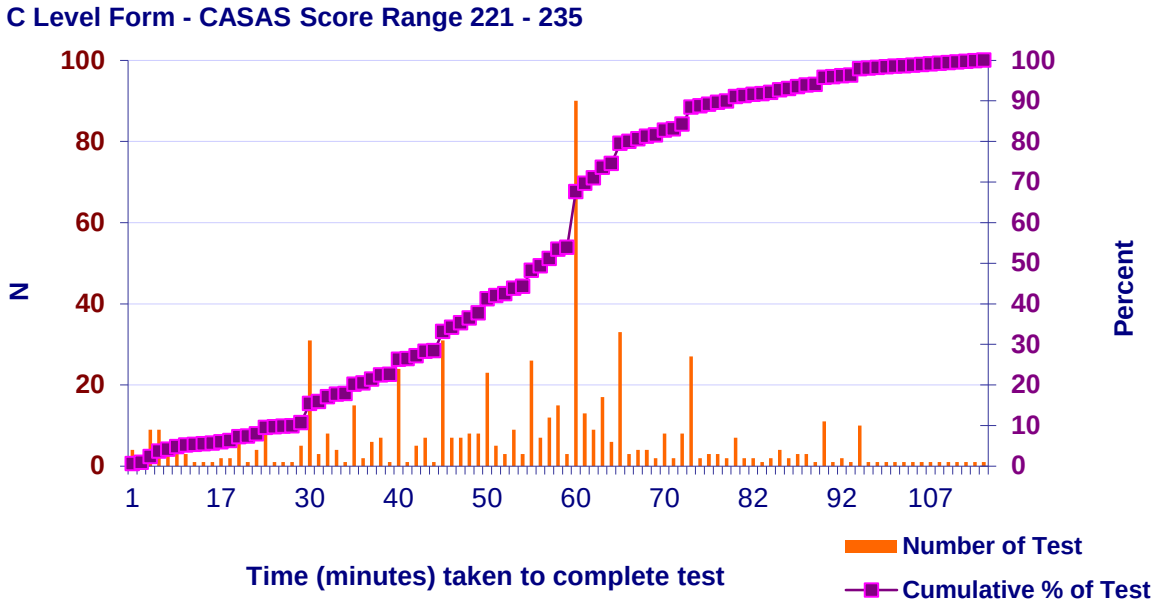
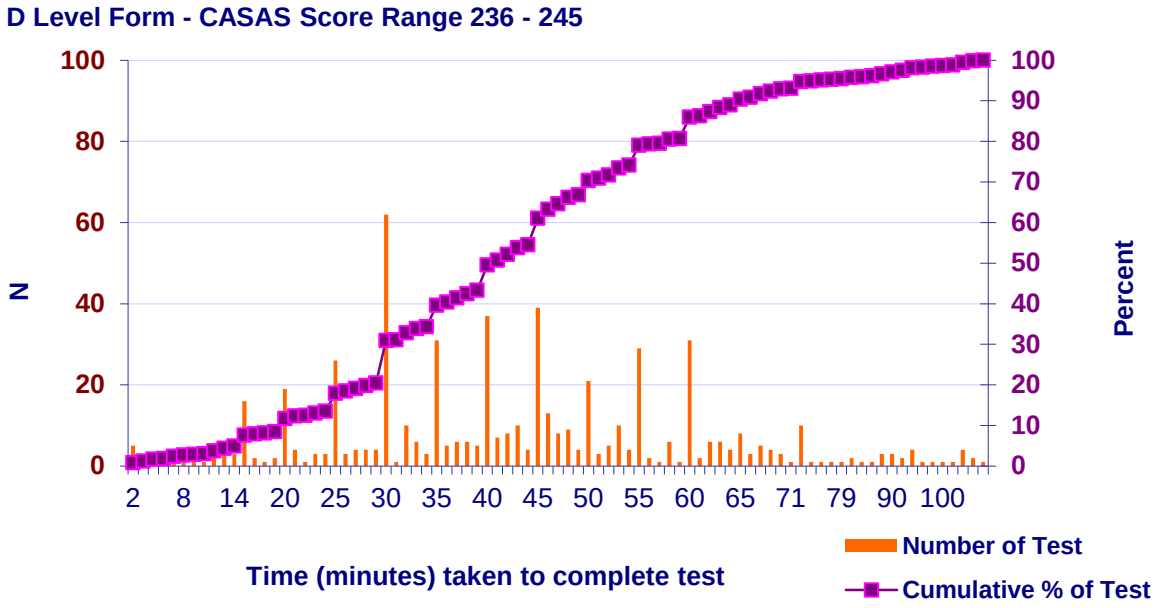


Figure i1-4 Test Taking Time for D Level Forms



Item i2 – Additional guidance on the interpretation of scores resulting from any modifications of the tests for an individual with a disability

The following guidelines are published for providing accommodations using CASAS assessment for learners with disabilities:

Local Agency Responsibility

Local agencies are responsible for providing fully accessible services and for ensuring that these services meet reasonable criteria. Adult learners with disabilities are responsible for requesting accommodations and for submitting documentation of their disability at the time of registration, program entry, or after diagnosis. The need to use an accommodation should be documented in official learner records, such as the Individual Education Plan (IEP) or Individualized Plan for Employment (IPE). The documentation must show that the disability interferes with the learner's ability to demonstrate performance on the test. The information can come from a doctor's report, a diagnostic assessment from a certified professional, and other clinical records. Adult agencies can often contact the local division of vocational rehabilitation or a secondary school to request documentation of a disability.

Accommodations in Test Administration Procedures

Local test administrators may provide or allow some accommodations in test administration procedures or environment for documented disabilities without contacting

CASAS. Test administrators often use these same strategies as *test taking strategies* for other learners who do not have documented disabilities. Examinees may request to take only one test per day or to test in an alternate quiet room. Examinees may also use a variety of strategies when they take a test, such as a plain straight-edge ruler, magnifying strips or glass, colored overlays, ear plugs, and other devices as deemed appropriate (www.acenet.edu/calec/ged/).

Sample accommodations in test administration procedures or environment are shown in Table i2-1. Examples of these accommodations are extended time, supervised breaks, sign language interpreter (*for test administration directions only)* and magnifier. *Reading* the test is not an appropriate accommodation. The accommodations listed are suggestions only. Accommodations are based on needs of individual learners who have documented disabilities and must be consistent with documentation in the annual plan, such as an IEP. Contact CASAS for more information on other accommodations for documented disabilities.

Use of Appropriate CASAS Test Forms

It is important to use an appropriate test form that best meets the examinee's goals and manner of receiving and reporting information. Most learners with a disability can take some form of a CASAS test. CASAS is able to provide large-print versions of all tests. Large-print tests and computer-based tests are examples of test forms often used for those with documented disabilities based on need. The ECS Reading Assessments are available in large-print forms and in computer-based delivery of the assessments. There is also a Braille version of reading assessment available.

Table i2-1 Accommodations in Test Administration Procedures

Disability	Test Administration Procedures	CASAS Test Forms Available
Specific Learning Disability and/or ADHD such as dyslexia, dyscalculia, receptive aphasia, hyperactivity, written language disorder, attention deficit disorder	Extended time Alternate schedule Frequent breaks Scribe/writer/alternate room Computer — spelling and grammar check disabled Simple calculator for Level A/B only	Large-print tests
Deaf or Hearing Impaired	Sign language interpreter for test directions only Head phones for those taking a listening test	
Blind or Visually Impaired	Magnifier	Large-print tests Braille format Computer-based tests
Mobility impairment	Extended time Alternate site/equipment	
	Scribe/writer/ communication board	
Psychiatric Disability such as schizophrenia, major depression		
Developmental Disability such as autism, cerebral palsy, epilepsy, mental retardation		

Item i3 – The manual provided to test administrators containing procedures and instructions for test security and administration

The ECS Reading Assessments Test Administration Manual (TAM) is included as an attachment. It includes information for administering ECS reading tests.

Item i4 – A description of the training or certification required of test administrators and scorers by the test publisher

To ensure the accurate administration of tests and the consistent interpretation of test results for each examinee, all agencies that use the CASAS system must complete CASAS Implementation Training. Depending on the particular assessments that an agency chooses, Implementation Training may be four to six hours long.

Throughout the Implementation Training workshop, participants learn standardized test administration procedures, take a sample CASAS test themselves, score and interpret

their test results, identify appropriate instructional materials based on test results, and complete a variety of additional activities. These activities include a case study that follows a student from initial intake and pretesting through the post-testing process.

Implementation Training workshops are conducted by CASAS certified trainers who have completed a series of detailed steps to become state or national-level trainers. These steps are outlined in the Facilitator and Trainer Classifications form and include observing multiple trainings, co-training with a state or national-level trainer and, as a final step, conducting training while being observed and evaluated by a CASAS national-level trainer. States that implement CASAS on a statewide basis maintain their own certified trainers and track those who have completed Implementation Training.

CASAS offers several venues for local providers to attend training. CASAS can send a certified trainer to the provider's agency, agency staff can come to CASAS, or staff can attend the CASAS National Summer Institute held each June. Smaller, rural agencies have a distance-training option offered via CD-Rom or through an online meeting center. The distance-training option is also widely used as an ongoing staff development tool for agencies that use the CASAS system.

Local providers who have completed Implementation Training and have questions about test administration or related matters receive ongoing, complimentary technical assistance through the CASAS 800 number. CASAS assessment specialists are always available to answer questions as a follow up to training.

At the completion of all training workshops, attendees complete a CASAS Training Verification form collected by CASAS. Information about each attendee is entered into the CASAS training database to ensure that only those who have met training requirements are eligible to obtain and administer CASAS assessments

Item i5 – A description of retesting (e.g., re-administration of a test because of problems in the original administration such as a test taker becomes ill and cannot finish, there are external interruptions during testing, or there are administration errors) procedures and the analysis upon which the criteria for retesting are based

The following is the CASAS re-testing policy for the ECS Reading Assessments:

CASAS Retesting Policy Statement

The re-administration of a test may be necessary because of problems in original administration that can include student illness, external disruptions, or administration errors. Although such events may be infrequent, CASAS has an established assessment policy to mitigate these circumstances. CASAS recommends that learners who experience any of these events will need to repeat the testing procedure. CASAS advises that these learners be administered the alternate form of the test in progress at the time of the disruption. For example, a student in the process of taking an Employability Competency System (ECS), Form 13 Level B Reading test during the disruption should,

upon returning to the testing situation, take the alternate form of this test: ECS, Form 14 Level B Reading or ECS Form 114, Level B Reading. The parallel forms that comprise the ECS Reading Assessments are constructed so that the two forms can be used independently of each other and are considered equivalent measures. The items within the parallel forms contain comparable content to reflect the same construct.

The same policy applies to examinees who take a CASAS computer-based test (CBT).

Test administrators should not retest learners on the same day that the disruption occurred. Retesting should occur at least 24 hours after the original test disruption event.

Future Development

Development of a new CASAS reading series, the *Life and Work Reading Assessments*, is underway. The content of this series will be based on priority competencies and content standards determined through a continued collaboration among the test developers, adult educators, learners, and adult education experts.

References

American Council on Education and National Council on Measurement in Education. (2006). *Educational Measurement* (4th ed.). Westport, CT: American Council on Education and Praeger Publishers.

American Council on Education and National Council on Measurement in Education. (1989). R. L. Linn (Ed.) *Educational Measurement* (3rd ed.). New York: Macmillan Publishing Company.

American Council on Education. (1995). *The External Diploma Program: Assessment Procedures and Sample Assessment Materials.* Washington, D.C.

American Education Research Association, American Psychological Association, and National Council on Measurement in Education. (1999). Standards for Educational and Psychological Testing. Washington, D.C.

American Psychological Association. (1985). *Standards for Educational and Psychological Testing.* Washington, D.C.

American Psychological Association. (1986). Guidelines for computer-based tests and interpretations. Washington, D.C.

Anastasi, A. and Urbina, S. (1997). *Psychological testing* (7th ed.). Upper Saddle River, N.J.: Simon & Schuster.

Anderson, E. (1977). Sufficient Statistics and Latent Trait Models. *Psychometrika,* 42, 69-81.

Angoff, W.H. (1971). Scales, Norms and Equivalent Scores. In R.L. Thorndike (Ed.), In *Educational Measurement* (2nd ed.) Washington, D.C.: American Council on Education.

Baldwin, J., Kirsch, I., Rock, D., and Yamamoto, K. (1995). *The Literacy Proficiencies of GED Examinees: Results from the GED-NALS Comparison Study.* Washington, D.C.: American Council on Education and Educational Testing Service.

Berk, R.A. (2000). Ask Mr. Assessment Person: How do you estimate the reliability of teacher licensure/certification tests? In *Teachers: Supply and demand in an age of rising standards.* National Evaluation Systems, Inc.

Bond, T.G., and Fox, C. (2001). *Applying the Rasch Model: Fundamental Measurement in the Human Sciences.* Mahwah, N.J.

Brennan, Robert L. (2006). National Council on Measurement in Education, American Council on Education. *Educational Measurement.* Westport, CT: Praeger Publishers

Browne, M. W., and Cudeck, R. (1993). Alternative Ways of Assessing Model Fit. In K.A. Bollen and J.J. Long (Eds.). In *Testing Structural Equation Models*, 132-162. Beverly Hills,

CA: SAGE.
California Department of Education. (1977). *California Proficiency Assessment Exercise Manual.* Sacramento, CA.

California State Department of Education. (1987). *CBAE Evaluation Study Report. Investing In Change: Competency-Based Adult Education in California.* Sacramento, CA.

California Department of Education. (1977). *Technical Assistance Guide.* Sacramento, CA.

Campbell, D.T., and Stanley, J.C. (1966). *Experimental and quasi-experimental designs for research.* Chicago: Rand McNally.

Center for Applied Linguistics. (1984). *Basic English Skills Test (BEST).* Washington, D.C.

Center for Applied Linguistics. (1984). *Student Performance Levels (SPL).* Washington, D.C.

Chau, P.K. (1997). Re-Examining a Model for Evaluating Information Center Success Using a Structural Equation Modeling Approach. *Decision Sciences* 28, no. 2, 309-334.

Comprehensive Adult Student Assessment System (CASAS). (1993). *An Application Submitted to the Program Effectiveness Panel of the National Diffusion Network, U.S. Department of Education: Summary Document.* San Diego, CA: Comprehensive Adult Student Assessment System, Foundation for Educational Achievement.

Comprehensive Adult Student Assessment System (CASAS). (1999). *The CABSS Report: California Adult Basic Skills Survey*. San Diego, CA: Comprehensive Adult Student Assessment System, Foundation for Educational Achievement.

Comprehensive Adult Student Assessment System (CASAS). (2002). *A CYA and CCC Study conducted for proposal submitted to California Department of Education for the Alternative School Accountability Model (ASAM).* San Diego, CA: Comprehensive Adult Student Assessment System, Foundation for Educational Achievement.

Comprehensive Adult Student Assessment System (CASAS). (1994, 1998, 2000). *Continuous Improvement Measure: CIM Manual.* San Diego, CA: Comprehensive Adult Student Assessment System, Foundation for Educational Achievement.

Comprehensive Adult Student Assessment Systems (CASAS). (2009). *Guidelines for Providing Accommodations Using CASAS Assessment for Learners with Disabilities.* San Diego, CA: Comprehensive Adult Student Assessment System, Foundation for Educational Achievement.

Comprehensive Adult Student Assessment System (CASAS). (1997). *The Iowa Adult Basic Skills Survey.* San Diego, CA: Comprehensive Adult Student Assessment System, Foundation for Educational Achievement.

Comprehensive Adult Student Assessment System (CASAS). (2003). *Study of the CASAS Relationship to GED 2002.* San Diego, CA: Comprehensive Adult Student Assessment System, Foundation for Educational Achievement.

Comprehensive Adult Student Assessment System (CASAS). (1997). *Targeting Education: The Connecticut Adult Basic Skills Survey*. San Diego, CA: Comprehensive Adult Student Assessment System, Foundation for Educational Achievement.

Comprehensive Adult Student Assessment System (CASAS). (1996). *A Workforce Basic Skills Norming Study of Iowa's JTPA and PROMISE JOBS Target Populations.* San Diego, CA: Comprehensive Adult Student Assessment System, Foundation for Educational Achievement.

Comprehensive Adult Student Assessment System (CASAS) and ACT Center for Education and Work. (1997). *Extending the Ladder: From CASAS to Work Keys Assessments.* San Diego, CA: Comprehensive Adult Student Assessment System, Foundation for Educational Achievement, and Iowa City, Iowa: ACT.

Cook, L., Eignor, D. and Petersen, N. (1982). *A Study of the Temporal Stability of IRT Item Parameter Estimates.* Paper presented at the annual meeting of the American Educational Research Association, New York.

Crocker, L. and Algina, J. (1984). *Introduction to Classical and Modern Test Theory.* New York: Holt, Rinehart, and Winston.

Cronbach, L.J. and Shavelson, R.J. (2004). My current thoughts on coefficient alpha and successor procedures. *Educational and Psychological Measurement,* 64 (3), 391-418.

Division of Adult Education and Literacy Office of Vocational and Adult Education U.S. Department Of Education (2010). *Implementation Guidelines Measures and Methods for the National Reporting System for Adult Education.*

Dorans, N. J., and Holland, P.W. (1993). DIF Detection and Description: Mantel-Haenszel and Standardization. In P.W. Holland and H. Wainer (Eds.). In *Differential Item Functioning.* Hillsdale, N.J.: Lawrence Erlbaum Associates.

Downing, Steven M. and Haladyna, Thomas M. (2006). *Handbook of Test Development.* Mahwah, N.J.: Lawrence Erlbaum Associates.

Drasgow, F., Luecht, R. M., and Bennett, R. E. (2006). Technology and Testing. In R. L. Brennan (Ed.). *Educational Measurement* (4th ed.). Westport, CT: American Council on Education and Praeger Publishers.

Educational Testing Service. (2008). *ETS fairness review guidelines.* Princeton, N.J.

Educational Testing Service. (2002). *ETS Standards for Quality and Fairness.* Princeton, N.J.
Federal Office of Refugee Resettlement (ORR). (1983). *Mainstream English Language Training Project (MELT).* Washington, D.C.

Feldt, L.S. (1980). A test of the hypothesis that Cronbach's alpha reliability coefficient is the same for two tests administered to the same sample. *Psychometrika,* 45, 99-105.

Feldt, L.S., and Brennan, R.L. (1989). Reliability. In R.L. Linn (Ed.), *Educational measurement.* (3rd ed., pp. 105-146). New York: Macmillan.

Forster, F., and Ingebo, G. (1978). The Theory of the Rasch Model (for School Testing Folk). *Rasch Monograph Series of the Northwest Evaluation Association*.
Gulliksen, H. (1950). *Theory of mental tests.* New York: Wiley.

Haladyna, Thomas M. (1985). *A Quantitative Review of Research on Multiple-Choice Item Writing.* Paper presented at the annual meeting of the American Educational Research Association, Chicago.

Haladyna, Thomas M. (1999). *Developing and Validating Multiple-Choice Test Items*. (2nd ed.). Mahwah, N.J.: Lawrence Erlbaum Associates.

Hambleton, R., and Swaminathan, H. (1985). *Item Response Theory: Principles and Applications*. Boston: Kluwer-Nyhoff.

Hambleton, R.K., and Jones, R.W. (1993). Comparison of classical test theory and item response theory and their applications to test development. *Educational Measurement: Issues and Practice*, 12 (3), 38-45.

Hambleton, R.K., ed., (1983). *Applications of Item Response Theory*. Vancouver, British Columbia: Educational Research Institute of British Columbia.

Hambleton, R.K., Swaminathan, H., and Rogers, H.J. (1991). *Fundamentals of Item Response Theory*. Newbury Park, CA: SAGE.

Holland P. W., and Thayer, D.T. (1988). Differential Item Performance and the Mantel-Haenszel Procedure. In H. Wainer, and H. I. Brown (Eds.). In *Test Validity.* Hillsdale, N.J.: Laurence Erlbaum Associates.

Indiana Department of Education, Division of Adult Education. (1996). *Validation of Foundation Skills.* Indianapolis, IN.

Jöreskog, K. G., and Sörbom, D. (2001). LISREL 8, *User's Reference Guide.* [Computer Software]. Chicago: Scientific Software International.

Kane, M. (2006). Validation. In R. Brennan (Ed.). Educational Measurement (4th ed.) (pp. 17-65). Westport, CT: American Council on Education and Praeger Publishers.

Karantonis, A. and Sireci, S. G. (2006). The bookmark standard setting method: A literature review. *Educational Measurement,* 25(1), 4-12

Kasworm, C. (1980). Administrative Issues in CBAE: Fairy Tales, the In-Between, and the Reality. *NAPCAE Exchange* 3, no. 2, 18-21.

King, J.A., and Evans, K.M. (1991). Can We Achieve Outcome-Based Education? *Educational Leadership,* 49, no. 2.

Lewis, D. M., Mitzel, H.C., and Green, D. R. (1996, June). Standard setting: A bookmark approach. In D. R. Green (Chair), *IRT-based standards-setting procedures utilizing behavioral anchoring.* Symposium conducted at the Council of Chief State School Officers Annual Conference on Large-Scale Assessment, Phoenix, AZ.
Linacre, J.M. (2003). WINSTEPS Rasch Measurement Computer Program. [Computer Software]. Chicago.

Lord, F.M. (1980). *Applications of item response theory to practical testing problems.* Hillsdale, N.J.: Laurence Erlbaum Associates.

Lord, F.M. (1984). Standard errors of measurement at different ability levels. *Journal of Educational Measurement,* 21, 239-243.

Martois, John. (1984). Measurement Issues Related to the Use of Item Response Theory Based on Life Skills Tests. Commissioned research submitted to the California State Department of Education, Adult Education Unit, Sacramento, CA.

Martois, J., Rickard, P., and Stiles, R. (1985). *Item Response Theory Based Life Skills Reading Tests: Their Unidimensionality and the Temporal Stability of Item Difficulty Estimates.* Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago.

Mazzeo, J. and Harvey, A. L. (1988). The equivalence of scores from automated and conventional educational and psychological tests: A review of the literature (College Board Rep. No. 88-8, ETS RR No. 88-21). Princeton, N.J.

Mead, A. D., and Drasgow, F. (1993). Equivalence of computerized and paper-and-pencil cognitive ability tests: A meta-analysis. *Psychological Bulletin,* 9, 287-304.

Messick, S. (1988). The once and future issues of validity. Assessing the meaning and consequences of measurement. In H. Wainer & H Braun. (Eds.) Hillsdale, N.H: Lawrence Erlbaum.

Messick, S. (1989). Validity. In *Educational Measurement*. In R.L. Linn. (3d ed.) New York: American Council on Education, Macmillan Publishing Company.

Mitzel, H. C., Lewis, D. M., Patz, R. J., and Green, D. R. (2001). The bookmark procedure: Psychological perspectives. In Cizek, G. J. (Ed.). *Setting performance standards: Concepts, methods and perspectives.* Mahwah, N.J.: Lawrence Erlbaum Associates.

National Research Council. (2000). *How People Learn Brain Mind Experience and School.* John D. Bransford, Ann L. Brown, and Rodney R. Cocking (Eds.). With additional materials from The Committee on Learning Research and Educational Practice, M. Suzanne Donovan, John D. Bransford, and James W. Pellegrino (Eds.). Washington, D.C. The National Academy Press.

National Research Council. (2001). *Knowing what learners know: The science and design of educational assessment.* Committee on the Foundations of Assessment. Pellegrino, J., Chudowsky, N., and Glaser, R (Eds.). Board on Testing and Assessment, Center for

Education. Division of Behavioral and Social Sciences and Education. Washington, D.C: The National Academy Press.

National Research Council. (2005). *Measuring literacy: Performance levels for adults.* Committee on Performance Levels for Adult Literacy, R.M. Hauser, C.F. Edley, Jr., J.A Koenig, and S.W. Elliott (Eds.). Board on Testing and Assessment, Center for Education. Division of Behavioral and Social Sciences and Education. Washington, D.C: The National Academy Press.

Nickse, R. (1980). *Assessing Life-Skills Competence: The New York State External High School Diploma Program.* CBE Forum Perspectives on Competency-Based Education 3. Belmont, CA: Pitman Learning, Inc.

Northcutt, N. (1977). *The Adult Performance Level Study.* Austin, TX: University of Texas. Northwest Evaluation Association. (1979). *Rasch Monograph Series of the Northwest Evaluation Association.*

Plake, B. S. (2005). Setting performance standards: Issues, methods. In Brian S. Everitt and David C. Howell (Eds.) *Encyclopedia of Statistics in Behavioral Science,* 4, 1820-1823.

Plake, B. S. (2007). Standards setters: Stand up and take a stand. 2006 Career Award address presented at the annual meeting of the National Council on Measurement in Education, Chicago.

Porter, K., and Feldman, N. *New York State External High School Diploma Program: Assessment Procedures and Sample Assessment Materials*. Syracuse, N.Y.: Syracuse Research Corporation.

RASCAL [Computer software]. (1989). St. Paul, MN: Assessment Systems Corporation. Rasch, G. (1980). *Probabilistic Models for Some Intelligence and Attainment Tests.* Copenhagen: Danmarks Paedagogiske Institut, 1960. Reprint, Chicago: University of Chicago Press.

Reckase, M. (1979). Unifactor Latent Trait Models Applied to Multi-factor Tests: Results and Implications. *Journal of Educational Statistics* 4, 207-230.

Reckase, M. (1988). *Computerized Adaptive Testing: A Good Idea Waiting for the Right Technology.* Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

Rentz, R.R., and Bashaw, W.L. (1979). The National Reference Scale for Reading: An Application of the Rasch Model. *Journal of Educational Measurement.*

Rickard, P. and Stiles, R. (1987). *Predicting the GED Test with CASAS, an IRT Life Skills Item Bank.* Paper presented the annual meeting of the National Council on Measurement in Education, Washington, D.C.

Rickard, P. and Whitney, D. (1983). *CASAS and GED Competencies: Are We Measuring the Same Skills?* Paper presented at the National Competency-based Adult Education Conference.

Samajima, Fumiko. (1994). Estimation of Reliability Coefficients Using the Test Information Function and Its Modifications. *Applied Psychological Measurement,* 18, 229.

Segars, A.H., and Grover, V. (1993, December). Re-Examining Perceived Ease of Use and Usefulness: A Confirmatory Factor Analysis. *MIS Quarterly* 17, no. 4, 517-525.

Sireci, S.G, Rogers, H.J., Swaminathan, H., Meara, K. and Robin, F. (2000). Appraising the Dimensionality of the NAEP Science Assessment Data. In *Grading the Nation's Report Card.* Washington, D.C.: National Academies Press.

Spady, W.G. (1974). The Sociological Implications of Mastery Learning. *In Schools, Society, and Mastery Learning.* J.H. Block (Ed.). New York: Holt, Rinehart & Winston.

Spady, W.G. (1977). Competency Based Education: A Bandwagon in Search of a Definition. *Educational Researcher* 6, no. 1, 9-14.

Spady, W.G. (1978). The Concept and Implication of Competency Based Education. *Educational Leadership* 36, 16-22.

Sticht, Thomas. (1990). *Testing and Assessment in Adult Basic Education and English as a Second Language Programs*. San Diego, CA: Applied Behavioral and Intellectual Sciences, Inc.

Stiles, R (1978). *Annual Evaluation Report.* Sacramento, CA: California State Department of Education.

Stiles, R., and Tibbets, J. (1986). Competency Based Education (CBE). In *Handbook on GAIN Educational Services.* Sacramento, CA: California Department of Education.

Subkoviak, M.J. (1976). Estimating reliability from a single administration of a criterion-referenced test. *Journal of Educational Measurement,* 13, 265-276.

Subkoviak, M.J. (1978). Empirical investigation of procedures for estimating reliability for mastery tests. *Journal of Educational Measurement,* 15, 111-116.

Thompson, B., and Vacha-Haase, T. (2000). Psychometrics is datametrics: The test is not reliable. *Educational and Psychological Measurement,* 60, 174-195.

TOPSpro [Computer Software]. Data collected July 1, 2004, through June 30, 2005. Workforce Investment Act, Title II, Aggregated Student Database. San Diego, CA: Comprehensive Adult Student Assessment System, Foundation for Educational Achievement.

Trochim, W. and Donnelly, J.P. (2007). The Research Methods Knowledge Base (3rd ed.). [Online], Atomic Dog Publishing.

UK NARIC. (2008). *National and International Benchmarking of WDA Workplace Literacy and Numeracy Qualifications*.

U.S. Department of Education. *Goals 2000.* (1993). Washington, D.C.

U.S. Department of Education. National Center for Educational Statistics. (1982). *Adult Learning Activities Terminology.* Washington, D.C.

U.S. Department of Labor. (1991). *The Secretary's Commission on Achieving Necessary Skills. What Work Requires of Schools: A SCANS Report for America 2000.* Washington, D.C.

Woodruff, D.J. (1990). Conditional standard error of measurement in prediction. *Journal of Educational Measurement,* 27, 191-208.

Wright, B.D. (1968). Sample-Free Test Calibration and Person Measurement. In *Proceedings of the 1967 Invitational Conference on Testing Problems.* Princeton, N.J.: Educational Testing Service.

Wright, B.D. (1977, Summer). Solving Measurement Problems with the Rasch Model. *Journal of Educational Measurement* 14, no. 2, 195-215.

Wright, B.D., and Masters, G.N. (1982). *Rating Scale Analysis: Rasch Measurement*. Chicago: MESA Press.

Wright, B.D. and Mead, R.J. (1977). *BICAL: Calibrating Items and Scales with the Rasch Model*. Research Memorandum No. 23. Chicago: University of Chicago, Department of Education, Statistical Laboratory.

Wright, B.D. and Mead, R.J. (1978). *BICAL: Calibrating Items and Scales with the Rasch Model*. Research Memorandum No. 23A. Chicago: University of Chicago, Department of Education, Statistical Laboratory.

Wright, B.D., and Stone, M.H. (1979). *Best Test Design.* Chicago: MESA Press.

Wright, B.D. and Stone, M.H. (1988). Stone. *Reliability in Rasch Measurement*. Research Memorandum No. 53. Chicago: University of Chicago, MESA Psychometric Laboratory.

Wright, B.D. and Stone, M.H. (1988, November). *Validity in Rasch Measurement.* Research Memorandum No. 54. Chicago: University of Chicago, MESA Psychometric Laboratory.

Yen, W.M. and Fitzpatrick, A. R. (2006). Item Response Theory. In R.L. Brennan (Ed.). Educational Measurement (4th ed.). Westport, CT: Praeger Publishers.