Introduction

Smarter Balanced has agreed to accept test results from its member states in multiple binary formats. To ensure that each format meets baseline requirements Smarter Balanced is publishing this Data Dictionary and Logical Data Model. Since it is a logical, not binary, specification it applies to all formats for transmitting test results data within the SmarterApp assessment infrastructure.

The Four-Layer Framework for Data Standards offers context for how this specification relates to other SmarterApp specifications. The four layers are:

1. Data Dictionary: Definition of data elements including name and interpretation.
2. Logical Data Model: Logical definition of entities as groups of elements and inter-entity relationships.
3. Serialization: Concrete digital format for storage or transmission of entities.
4. Protocol: Transport layer and message formats for exchanging serialized entities.

This specification describes test results at the Data Dictionary and Logical Data Model layers (layers 1 and 2). Other specifications address serialization and transmission protocols (layers 3 and 4). Field names and descriptions are mostly drawn from the Common Education Data Standards (CEDS) which also operates at layers 1 and 2.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119.

Extensibility

Nearly every test result format we have encountered includes additional information beyond the fields defined here. Data serialization formats should not be constrained to just these fields. Certain serialization formats like XML and JSON include standard extension mechanisms. Accordingly, extensions should be made at the serialization level. Future updates to the data dictionary and logical data model may incorporate fields from the various serialization formats.

Logical Data Model

The entity-relationship diagram in Figure 1 represents the logical data model for test results.
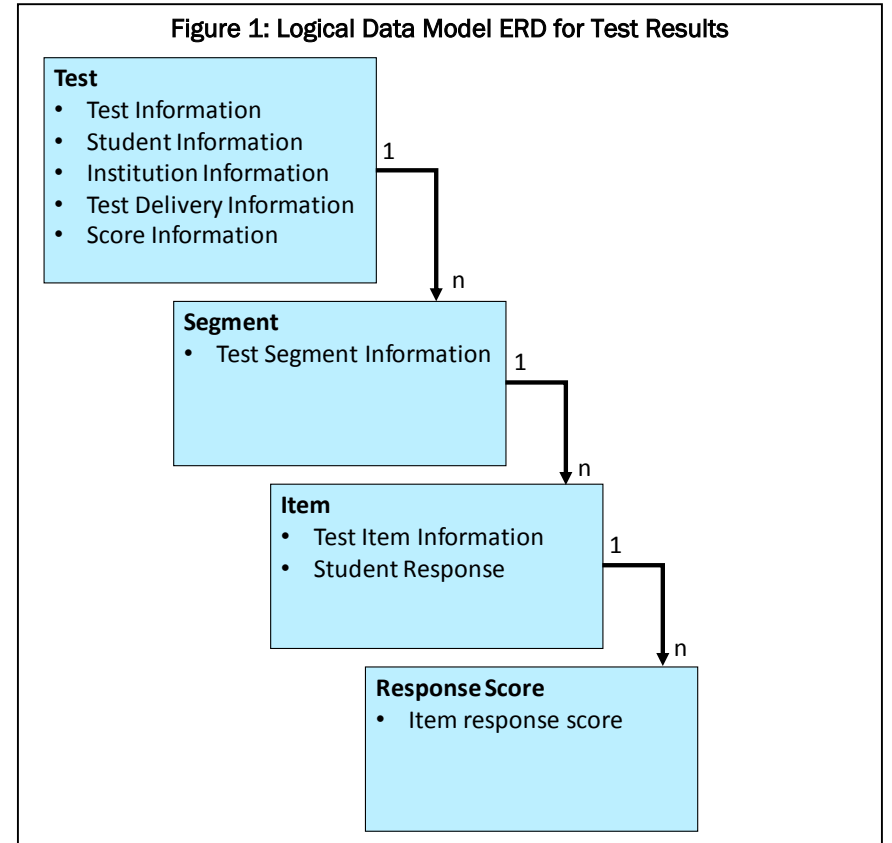
The data follows a strict hierarchy. Each test result has one **Test** record which contains information about the test itself; about the student and the institution to which the student belongs; about test delivery including date, time, and environment; and the overall test score information.

Each Test has one or more **segments**. In current Smarter Balanced tests there is always only one segment but the test delivery system and associated data formats support multiple segments and Smarter Balanced or other organizations may make use of this feature in the future.

Each segment is composed of multiple assessment **items**. For fixed-form segments, all students are presented the same set of items in the same order. For computer-adaptive segments, the items presented and the order varies according to performance and other factors managed by the adaptive assessment engine. Each item record contains information about the assessment item and the full student response to the item.

An item has one or more **response scores** most items have a single score. However, certain items are scored on multiple dimensions each representing a different skill family. For multidimensional items there is one response score record per scoring dimension.

The hierarchical data organization is well-suited to certain serialization formats like XML and JSON. However, CSV is a more popular format for transmitting test results and it is not well-suited to hierarchical data. When rendering test results in tabular formats like CSV a common approach is to use two tables. One table represents the test information. The second table (usually in a different CSV file) collapses the segment, item, and response score information into a single table. Segment and item information is repeated for each score. Since most items have only one score and there is very little segment information in the data model, this approach can be quite efficient.

Figure 1: Logical Data Model ERD for Test Results

Test
- Test Information
- Student Information
- Institution Information
- Test Delivery Information
- Score Information

1
n

Segment
- Test Segment Information

1
n

Item
- Test Item Information
- Student Response

1
n

Response Score
- Item response score

Data Dictionaries

The following tables are the data dictionaries for each of the four entities: Test, Segment, Item, and ResponseScore.

Cross References

The rightmost column has cross-references to the following layer 3 formats:

- **TRT:** The SmarterApp Test Results Transmission format.
- **DWSA:** The SmarterApp Data Warehouse Student Assessment format
- **DWIL:** The SmarterApp Data Warehouse Item Level format
- **AIR:** The AIR CSV format for certain states.

When a cross reference includes "(opt)" it means the field is designated as optional in the referenced format.

Entity: Test

Description: All fields that appear once per test report.

Includes:

- Test Information
- Student Information
- Institution Information
- Test Delivery Information
- Score Information

Relationships 1:n Test to Segment

Occurrence One per test report.

Table 1: Test Entity Fields

Test Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	Cross Reference
Test Information							
AssessmentId	xsd:token	40	A unique number or alphanumeric code assigned to an assessment by its publisher.	One or more printable characters	Always	https://ceds.ed.gov/element/001067	**TRT:**testId **DWSA:**AssessmentGuid **AIR:**TstNm_ID
AssessmentName	xsd:token	250	The name given to an assessment event.	One or more printable characters	Always	https://ceds.ed.gov/element/000977	**TRT:**name **AIR:**Test_Name

Test Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	Cross Reference
Subject	xsd:token	10	The subject of the test	Math, ELA, etc.	Always	See[1] https://ceds.ed.gov/CEDSElementDetails.aspx?TermId=7021	**TRT:**subject **DWSA:**AssessmentAcademicSubject **AIR:**TestSubj
DeliveryMode	xsd:token	10	Mode of the test. Either 'online', 'paper' or 'scanned'. Here 'paper' means it was a data entry test (meaning the student took the test on paper and someone else then entered the responses in the online system).	online paper scanned Defaults to "online".	Paper or scanned: Required Online: Optional		**TRT:**mode **AIR:**TestMode (opt)
TestGrade	xsd:token	2	The typical grade or combination of grade-levels, developmental levels, or age-levels for which an assessment is designed.	IT, PR, PK, TK, KG, 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, PS, UG	Always	https://ceds.ed.gov/element/000177	**TRT:**grade **DWSA:**AssessmentLevelForWhichDesigned **AIR:**TestGrd
AssessmentType	xsd:token	50	The category of an assessment based on format and content.	Summative Interim	Always	https://ceds.ed.gov/element/000029	**TRT:**assessmentType **DWSA:**AssessmentType
SchoolYear	xsd:integer	4	The school year in which the test is administered. For academic years that span a calendar year this is the four digit year-end. E.g. 2013 for 2012-2013	1900 <= YYYY <= 9999	Always	https://ceds.ed.gov/element/000243	**TRT:**academicYear **DWSA:**AssessmentYear **AIR:**SchlYr
AssessmentVersion	xsd:token	30	The version number of the Assessment Form.	Alphanumeric	Optional	https://ceds.ed.gov/element/001183	**TRT:**assessmentVersion
Student Information							
StudentIdentifier	xsd:token	40	State-issued student ID	One or more printable characters	Identifed: Required Deidentified: Prohibited	https://ceds.ed.gov/element/001071	**TRT:**ExamineeAttribute-StudentIdentifier **DWSA:**StudentIdentifer **DWIL:**studentId **AIR:**SSID

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[1] The field definition for "Subject" matches CEDS. But the CEDS value enumeration is not used.

Test Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	Cross Reference
AlternateSSID	xsd:token	40 Present 65 Future	Alternate State Student ID. This ID is required with de-identified student data so that the recipient match data that corresponds to the same student but cannot identify the student.[2]	One or more printable characters	Identifed: Optional Deidentified: Required	https://ceds.ed.gov/element/001071	**TRT:**ExamineeAttribute-AlternateSSID **DWSA:**ExternalSSID
FirstName	xsd:token	35	Student first name	One or more printable characters.	Identifed: Required Deidentified: Prohibited	https://ceds.ed.gov/element/000115	**TRT:**ExamineeAttribute-FirstName **DWSA:**FirstName
MiddleName	xsd:token	35	Student middle name	One or more printable characters.	Identifed: Optional Deidentified: Prohibited	https://ceds.ed.gov/element/000184	**TRT:**ExamineeAttribute-MiddleName **DWSA:**MiddleName
LastOrSurname	xsd:token	35	Student last name	One or more printable characters.	Identifed: Required Deidentified: Prohibited	https://ceds.ed.gov/element/000172	**TRT:**ExamineeAttribute-LastOrSurname **DWSA:**LastOrSurname
Birthdate	xsd:date	10	Student's birthdate	YYYY-MM-DD. For example 2006-07-15	Identifed: Required Deidentified: Prohibited	https://ceds.ed.gov/element/000033	**TRT:**ExamineeAttribute-Birthdate **DWSA:**Birthdate
GradeLevelWhenAssessed	xsd:token	2	The grade or developmental level of a student when assessed.	IT, PR, PK, TK, KG, 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, PS, UG	Always	https://ceds.ed.gov/element/000126	**TRT:**ExamineeAttribute-GradeLevelWhenAssessed **DWSA:**GradeLevelWhenAssessed **AIR:**Grade
Sex	xsd:token	6	The student's gender.	Male, Female	Always	https://ceds.ed.gov/element/000255	**TRT:**ExamineeAttribute-Sex **DWSA:**Sex **AIR:**Gndr

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[2] Any method that generates a consistent alternate ID for each student is acceptable, Smarter Balanced recommends applying a keyed-hash algorithm like HMAC-SHA1 to the StudentIdentifier. The algorithm is described here: https://tools.ietf.org/html/rfc2104. When using a keyed-hash algorithm, the key should be kept private to the state and their service provider and not disclosed to Smarter Balanced. Possession of the key will allow the state to match the AlternateSSID to the state-issued StudentIdentifier. However, Smarter Balanced will not have that ability. There have been some security concerns raised relative to SHA1 and MD5 but they do not apply to this use pattern. Newer algorithms like HMAC-SHA256 are free of known issues but they generate codes that are too long for the reserved field length of 40 characters. Future updates will increase the maximum field length to allow longer values.

Test Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	Cross Reference
HispanicOrLatinoEthnicity	xsd:token	3	An indication that the person traces his or her origin or descent to Mexico, Puerto Rico, Cuba, Central and South America, and other Spanish cultures, regardless of race.	Yes, No	Always	https://ceds.ed.gov/element/000144	**TRT:**ExamineeAttribute-HispanicOrLatinoEthnicity **DWSA:**HispanicOrLatinoEthnicity **AIR:**HispEthnicFg
AmericanIndianOrAlaskaNative	xsd:token	3	A person having origins in any of the original peoples of North and South America (including Central America), and who maintains cultural identification through tribal affiliation or community attachment.	Yes, No	Always	https://ceds.ed.gov/element/000016	**TRT:**ExamineeAttribute-AmericanIndianOrAlaskaNative **DWSA:**AmericanIndianOrAlaskaNative **AIR:**AmerIndianAlsknNtvRaceFg
Asian	xsd:token	3	A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian Subcontinent. This area includes, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.	Yes, No	Always	https://ceds.ed.gov/element/000020	**TRT:**ExamineeAttribute-Asian **DWSA:**Asian **AIR:**AsianRaceFg
BlackOrAfricanAmerican	xsd:token	3	A person having origins in any of the black racial groups of Africa.	Yes, No	Always	https://ceds.ed.gov/element/000034	**TRT:**ExamineeAttribute-BlackOrAfricanAmerican **DWSA:**BlackOrAfricanAmerican **AIR:**BlackRaceFg
White	xsd:token	3	A person having origins in any of the original peoples of Europe, Middle East, or North Africa.	Yes, No	Always	https://ceds.ed.gov/element/000301	**TRT:**ExamineeAttribute-White **DWSA:**White **AIR:**WhiteRaceFg
NativeHawaiianOrOtherPacificIslander	xsd:token	3	A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.	Yes, No	Always	https://ceds.ed.gov/element/000192	**TRT:**ExamineeAttribute-NativeHawaiianOrOtherPacificIslander **DWSA:**NativeHawaiianOrOtherPacificIslander **AIR:** PacIsIndrRaceFg
DemographicRaceTwoOrMoreRaces	xsd:token	3	A person having origins in any of more than one of the racial groups. To support backward compatibility for systems that cannot derive this, i.e. systems that use a single race/ethnicity element rather than separate flags that can indicate one or more ethnicities	Yes, No	Always	https://ceds.ed.gov/element/000973	**TRT:**ExamineeAttribute-DemographicRaceTwoOrMoreRaces **DWSA:**DemographicRaceTwoOrMoreRaces **AIR:**DemographicRaceTwoOrMoreRaces

Test Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	Cross Reference
IDEAIndicator	xsd:token	3	Student has an Individual Education Plan according to the IDEA act. (See reference for the full definition).	Yes, No	Always	https://ceds.ed.gov/element/000151	**TRT:**ExamineeAttribute-IDEAIndicator **DWSA:**IDEAIndicator **AIR:**IEP
LEPStatus	xsd:token	3	Student with Limited English Proficiency. See reference for the full definition).	Yes, No	Always	https://ceds.ed.gov/element/000180	**TRT:**ExamineeAttribute-LEPStatus **DWSA:**LEPStatus **AIR:**LEP
Section504Status	xsd:token	3	Individuals with disabilities who are being provided with related aids and services under Section 504 of the Rehabilitation Act of 1973, as amended.	Yes, No	Always	https://ceds.ed.gov/element/000249	**TRT:**ExamineeAttribute-Section504Status **DWSA:** Section504Status **AIR:**504Plan
EconomicDisadvantageStatus	xsd:token	3	An indication that the student met the State criteria for classification as having an economic disadvantage.	Yes, No, Unspecified	Always	https://ceds.ed.gov/element/000086	**TRT:**ExamineeAttribute-EconomicDisadvantageStatus **DWSA:**EconomicDisadvantageStatus **AIR:**EconomicDisadvantageStatus
LanguageCode	xsd:token	3	The code for the specific language or dialect that a person uses to communicate.	See http://ceds.ed.gov/languageCodes.aspx	Optional	https://ceds.ed.gov/CEDSElementDetails.aspx?TermId=7317	**TRT:**ExamineeAttribute-LanguageCode (opt)
EnglishLanguageProficiencyLevel	xsd:token	20	A state-specific indication of the student's English language proficiency level.	Should match a state-specific taxonomy,	Optional	Related to https://ceds.ed.gov/CEDSElementDetails.aspx?TermId=5527	**TRT:**ExamineeAttribute-EnglishLanguageProficiencyLevel (opt) **AIR:**EnglishLanguageProficiencyLevel (opt)
MigrantStatus	xsd:token	3	Student and/or parents are migratory. (See reference for the complete definition.)	Yes, No	Optional	https://ceds.ed.gov/element/000189	**TRT:**ExamineeAttribute-MigrantStatus **AIR:**MigrantStatus (opt)
FirstEntryIntoUSSchool	xsd:date	10	The year, month and day of a person's initial enrollment into a United States school.	YYYY-MM-DD	Optional	https://ceds.ed.gov/element/000529	**TRT:**ExamineeAttribute-FirstEntryIntoUSSchool **AIR:**FirstEntryIntoUSSchool (opt)
LimitedEnglishProficiencyEntryDate	xsd:date	10	The year, month and day a student classified as limited English proficient entered the LEP program.	YYYY-MM-DD	Optional	https://ceds.ed.gov/element/001247	**TRT:**ExamineeAttribute-LimitedEnglishProficiencyEntryDate **AIR:**LimitedEnglishProficiencyEntryDate (opt)

Test Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	Cross Reference
LEPExitDate	xsd:date	10	The year, month and day a student classified as limited English proficient exited the LEP program.	YYYY-MM-DD	Optional	https://ceds.ed.gov/element/000570	**TRT:**ExamineeAttribute-LEPExitDate **AIR:**LEPExitDate (opt)
TitleIIILanguageInstructionProgramType	xsd:token	20	The type of Title III language instructional programs.	See the reference for the set of acceptable codes and definitions.	Optional	https://ceds.ed.gov/element/000447	**TRT:**ExamineeAttribute-TitleIIILanguageInstructionProgramType **AIR:**TitleIIILanguageInstructionProgramType (opt) (opt)
PrimaryDisabilityType	xsd:token	3	The major or overriding disability condition that best describes a person's impairment.	See the reference for the set of acceptable codes and definitions.	Optional	https://ceds.ed.gov/element/000218	**TRT:**ExamineeAttribute-PrimaryDisabilityType **AIR:**PrimaryDisabilityType (opt)
Institution Information							
StateAbbreviation	xsd:token	2	Abbreviation for the state or territory in which the student attends school.	A two-letter state or territory abbreviation according to U.S. Postal standards.	Required	https://ceds.ed.gov/element/000267	**TRT:**ExamineeRelationship-StateAbbreviation **DWSA:**StateAbbreviation
DistrictId	xsd:token	40	The ID of the district responsible for specific educational services and/or instruction of the student.	Alphanumeric	Identifed: Required Deidentified: Optional[3]	https://ceds.ed.gov/element/000637	**TRT:**ExamineeRelationship-DistrictId **DWSA:**ResponsibleDistrictIdentifier **AIR:**DistrictID
DistrictName	xsd:token	60	The Name of the district responsible for specific educational services and/or instruction of the student.	Alphanumeric	Optional	https://ceds.ed.gov/element/000204	**TRT:**ExamineeRelationship-DistrictName **DWSA:**OrganizationName
SchoolId	xsd:token	40	A unique number or alphanumeric code assigned to an institution by a school, school system, a state, or other agency or entity.	Alphanumeric	Identifed: Required Deidentified: Optional	https://ceds.ed.gov/element/001069	**TRT:**ExamineeRelationship-SchoolId **DWSA:**ResponsibleSchoolIdentifier **AIR:**SchoolID
SchoolName	xsd:token	60	The full legally accepted name of the institution.	Alphanumeric	Optional	https://ceds.ed.gov/element/000191	**TRT:**ExamineeRelationship-SchoolName **DWSA:**NameOfInstitution

[3] DistrictId, DistrictName, SchoolId, and SchoolName are optional in de-identified data. In certain areas, the school or district may be small enough that the school and/or district combined with gender, race, and ethnicity can identify the student. In those cases, the district and school information should be omitted to preserve student privacy. However, doing so prevents the generation of anonymous aggregate reports and the school and district level. Accordingly, states may choose their policy for inclusion according to local policy, population patterns, and requirements.

Test Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	Cross Reference
StudentGroupNames	xsd:token	50	One or more names of groups to which the student belongs. These may be classes, categories, programs or other groups that serve local needs. The physical format specification should indicate the format of the list (e.g. semicolon-delimited string, list of XML elements, JSON array, etc.	Up to ten names of up to 50 characters each.	Optional		**TRT:**ExamineeRelationship-StudentGroupName **DWSA:**Group1Id to Group10Id
Test Delivery Information							
TestOpportunityId	xsd:token	40	A unique identifier of the student-test opportunity. (Typically a GUID)	One or more printable characters	Always	https://ceds.ed.gov/element/001540	**TRT:**Opportunity-Key TRT see also Opportunity-oppId **AIR:**VndrTstEvent_ID
AssessmentAdministrationStartDate	xsd:date	10	The first date of the first window for a given assessment.	YYYY-MM-DD	Always	https://ceds.ed.gov/element/000962	**TRT:**effectiveDate
StartDateTime	xsd:dateTime	23	The actual date and time when the individual started taking the test.	YYYY-MM-DDTHH:MM:SS	Always	https://ceds.ed.gov/element/001021	**TRT:**startDate **AIR:**TStartDt
SubmitDateTime	xsd:dateTime	23	Date the student submitted the opportunity for scoring.	YYYY-MM-DDTHH:MM:SS	Always	https://ceds.ed.gov/element/001022	**TRT:**dateCompleted **AIR:**TEndDt
ForceSubmitDateTime	xsd:dateTime	23	The date and time in which a test was force-submitted in behalf of the student. This may be an incomplete test (not all questions answered) or a complete test in which the student neglected to submit final answers. When this field is present, SubmitDateTime should be the last time the student answered a question or otherwise interacted with the testing system.	YYYY-MM-DDTHH:MM:SS	Optional		**TRT:**dateForceCompleted
Status	xsd:token	50	Status of the opportunity. Tracks the status of this test opportunity through the process of administration, resets, scoring, and reporting. (The values of completed and invalidated are deprecated in favor the Validity and Completeness fields.)	appeal completed (deprecated) expired handscoring invalidated (deprecated) paused reported reset scored submitted	Always		**TRT:**status **AIR:**TestStatus

Test Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	Cross Reference
StatusDateTime	xsd:dateTime	23	The date and time the status of this opportunity last changed.	YYYY-MM-DDTHH:MM:SS	Optional		**TRT:**statusDate
Validity	xsd:token	7	Validity of the test result. • **Valid or (Blank)** indicates that the assessment was given in a standardized (proctored) environment. Typically applied to summative assessments. • **Invalid** indicates that the test result has been marked invalid due to problems in the test administration or environment. Typically applied to summative assessments. • **Standardized** The assessment was administered in a standardized manner. It is appropriate to compare this score with other scores in the same manner. Typically applied to interim assessments. • **Nonstandardized** The assessment was administered in an informal – nonstandardized manner.	(blank) valid nonstandardized invalid	Always (If not present, will be calculated in the 2014-2015 school year)		
Completeness	xsd:token	8	Completeness of the test (whether student responded to all items in the test).	(none) partial complete	Always (If not present, will be calculated in the 2014-2015 school year)		
AccessibilityCodes	xsd:token	1000	A list of accessibility feature codes paired with accessibility feature use codes indicating the accessibility resources that were made available to the student. The physical format of the list and delimiters should be specified in the data serialization specification.	See the "ISAAP Accessibility Feature Codes" specification.	Always	See: https://ceds.ed.gov/element/000385	**TRT:**Accommodation-Code **DWSA:** Accommodation[4] **AIR:**Accommodation

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[4] As of 2015 The DWSA format uses separate fields for each accessibility code family. The format will be updated in the future. The columns correspond to the families in table 5. Field names are AccommodationAmericanSignLanguage, AccommodationBraille, AccommodationClosedCaptioning, AccommodationTextToSpeech, AccommodationAbacus, AccommodationAlternateResponseOptions, AccommodationCalculatior, AccommodationMultiplicationTable, AccommodationPrintOnDemand,

Test Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	Cross Reference
NumberOfResponses	xsd:unsignedInt	8	Number of items in this report. (Early software releases may include prefetched items that the student never saw but this behavior is discouraged).	Integer, 0 or greater	Always	https://ceds.ed.gov/element/001009	**TRT:**ItemCount **AIR:**NAttempt
FieldTestCount	xsd:unsignedInt	8	Number of field test items included in Itemcount	Integer, 0 or greater	Optional		**TRT:**ftCount (opt)
PauseCount	xsd:unsignedInt	8	number of times Examinee paused the opportunity	Integer, 0 or greater	Optional		**TRT:**pauseCount (opt) **AIR:**TOT_NUM_PAUSED (opt)
GracePeriodRestarts	xsd:unsignedInt	8	The number of times the student paused the test and restarted it within the grace period (typically 20 minutes).	Integer, 0 or greater	Optional		**TRT:**gracePeriodRestarts (opt) **AIR:**NUM_PAUSED_20 (opt)
AbnormalStarts	xsd:unsignedInt	8	The number of times the test was restarted after an abrupt end to a test (browser crash, power shutdown, network loss etc.).	Integer, 0 or greater	Optional		**TRT:**abnormalStarts
OpportunityCount	xsd:unsignedInt	8	A the number of times the student has taking this test including the present opportunity.	Integer, 1 or greater	Optional		**TRT:**opportunity (opt) **AIR:**Oprtnty
TestWindowId	xsd:token	50	the ID of the window in which the test was administered (E.g. SBAC-Spring-2015)	One or more printable characters	Always		**TRT:**windowId
TestSessionId	xsd:token	40	Test Delivery System ID for the session in which this test was taken. Typically unique to a time, location, and test administrator.	Zero or more printable characters	De-identified: Prohibited Otherwise: Optional		**TRT:**sessionId **DWSA:**AssessmentSessionLocationId **AIR:**TASessionID (opt)
TestAdministratorId	xsd:token	128	ID of the Test Administrator that administered this test. (Often the email address of the TA has been used but this is discouraged for privacy reasons.)	Zero or more printable characters	De-identified: Prohibited Otherwise: Optional	https://ceds.ed.gov/element/001572	**TRT:**TAID (opt) **AIR:**TAUserID (opt)
OrganizationName	xsd:token	60	The name of the organization with overall responsibility for the assessment event. Typically the name of the state (e.g. "Oregon")	One or more printable characters	Optional	https://ceds.ed.gov/element/000966	**TRT:**clientName

AccommodationPrintOnDemandItems, AccommodationReadAloud, AccommodationScribe, AccommodationSpeechToText, AccommodationStreamlineMode, AccommodationNoiseBuffer.

Test Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	Cross Reference
UserAgent	xsd:string	512	A space-delimited list of product tokens (keywords) with optional comments that identifies the client hardware and software with which the assessment was delivered to the student during the assessment session. In most cases, this is the User Agent String from a web browser. In other cases, it should follow the same format.	Alphanumeric	Online: Always	https://ceds.ed.gov/element/001152	**TRT:**assessmentParticipantSessionPlatformUserAgent
TestDeliveryServer	xsd:token	128	Name of the Test Delivery Service (TDS server that was used to administer this test.	One or more printable characters	Optional		**TRT:**server
TestDeliveryDatabase	xsd:token	128	Name of the TDS DB that was used to administer this test.	Zero or more printable characters	Optional	https://ceds.ed.gov/element/001539	**TRT:**database
WindowOpportunityCount	xsd:unsignedInt	8	The number of times a student has taken this test in this window.	Integer, 1 or greater	Optional		**TRT:**windowOpportunity
Test Score Information							
ScaleScore	xsd:float	8	The overall Scale Score earned by the student on this test.	A positive number, typically an integer.	Always	https://ceds.ed.gov/element/000245	**TRT:**Score/value[5] **DWSA:**AssessmentSubtestResultScoreValue **AIR:**SS_TOT
ScaleScoreStandardError	xsd:float	8	The standard error for the TestScaleScore	Floating point number	Always	https://ceds.ed.gov/element/001546	**TRT:**Score/standardError **DWSA:**AssessmentSubtestMinimumValue[6] **AIR:**SEM_TOTSS (opt)
ScaleScoreAchievementLevel	xsd:integer	1	The achievement level corresponding to the scale score.	For Smarter Balanced, overall achievement levels are 1 to 4.	Always	https://ceds.ed.gov/element/000245	**TRT:**Score/value **DWSA:**AssessmentPerformanceLevelIdentifier **AIR:**PL_TOT (opt)
OverallTheta	xsd:float	8	The overall theta value	Floating point number	Required for Validity Studies		**AIR:**THETA_TOT (opt)

[5] The TRT format uses the <Score> element for all scores and standard errors. See Appendix A for how to locate each particular score.

[6] In place of Standard Error, the DWSA format uses AssessmentSubtestMinimumValue and AssessmentSubtestMaximumValue which are the scale score minus and plus the standard error respectively. The same principle is applied to subscores which use AssessmentSubtestClaim1MinimumValue and AssessmentSubtestClaim1MaximumValue (substituting the claim number for 1 in subsequent claims).

Test Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	Cross Reference
OverallThetaStandardError	xsd:float	8	The standard error for the overall theta	Floating point number	Required for Validity Studies		**AIR:**SEM_TOT_THETA (opt)
Claim1Score	xsd:float	8	Score for claim #1 For Smarter Balanced: ELA Claim 1 is Reading Math Claim 1 is Concepts & Procedures	A positive number, typically an integer.	Conditional[7]	https://ceds.ed.gov/element/00024 5	**TRT:** Score/value **DWSA:**AssessmentSubtestR EsultScoreClaim1Value **AIR:**SS_SRC1
Claim1ScoreStandardError	xsd:float	8	Standard error for claim #1	Floating point number	Conditional	https://ceds.ed.gov/element/00154 6	**TRT:** Score/standardError **DWSA:**AssessmentSubtestR esultScoreClaim1MinimumV alue **AIR:**SEM_SRC1
Claim1ScoreAchievementLevel	xsd:integer	1	The achievement level corresponding to claim score #1	For Smarter Balanced, claim achievement levels are 1 to 3.	Conditional	https://ceds.ed.gov/element/00024 5	**TRT:** Score/value **DWSA:**AssessmentClaim1Pe rformanceLevelIdentifier **AIR:**PL_SRC1
Claim1Theta	xsd:float	8	The theta value for claim #1	Floating point number	Required for Validity Studies		**AIR:**THETA_SRC1
Claim1ThetaStandardError	xsd:float	8	Standard error for the claim 1 theta	Floating point number	Required for Validity Studies		**AIR:**SEM_THETA_SRC1
Claim2Score	xsd:float	8	Score for claim #2 For Smarter Balanced: ELA Claim 2 is Writing Math combines the scores for Claim 2-Problem Solving, and Claim 4-Modeling and Data Analyisis into ClaimScore2	A positive number, typically an integer.	Conditional	https://ceds.ed.gov/element/00024 5	**TRT:**Score/value **DWSA:**AssessmentSubtestR EsultScoreClaim2Value **AIR:**SS_SRC2
Claim2ScoreStandardError (Score/standardError)	xsd:float	8	Standard error for claim #2	Floating point number	Conditional	https://ceds.ed.gov/element/00154 6	**TRT:**Score/standardError **DWSA:**AssessmentSubtestR esultScoreClaim2MinimumV alue **AIR:**SEM_SRC2

[7] Claim scores are required if the associated test produces them. For example, the Smarter Balanced summative tests produce four claim scores for ELA and three for Mathematics. When a claim score is present, the associated standard error and achievement level are also required.

Test Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	Cross Reference
Claim2ScoreAchievementLevel	xsd:integer	1	The achievement level corresponding to claim score #2	For Smarter Balanced, claim achievement levels are 1 to 3.	Conditional	https://ceds.ed.gov/element/000245	**TRT:**Score/value **DWSA:**AssessmentClaim2PerformanceLevelIdentifier **AIR:**PL_SRC2
Claim2Theta	xsd:float	8	The theta value for claim #1	Floating point number	Required for Validity Studies		**AIR:**THETA_SRC1
Claim2ThetaStandardError	xsd:float	8	Standard error for the claim 1 theta	Floating point number	Required for Validity Studies		**AIR:**SEM_THETA_SRC1
Claim3Score	xsd:float	8	Score for claim #3 For Smarter Balanced: ELA Claim 3 is Speaking and Listening Math Claim 3 is Communicating Reasoning	A positive number, typically an integer.	Conditional	https://ceds.ed.gov/element/000245	**TRT:**Score/value **DWSA:**AssessmentSubtestREsultScoreClaim3Value **AIR:**SS_SRC3
Claim3ScoreStandardError	xsd:float	8	Standard error for claim #3	Floating point number	Conditional	https://ceds.ed.gov/element/001546	**TRT:**Score/standardError **DWSA:**AssessmentSubtestResultScoreClaim3MinimumValue **AIR:**SEM_SRC3
Claim3ScoreAchievementLevel	xsd:integer	1	The achievement level corresponding to claim score #3.	For Smarter Balanced, claim achievement levels are 1 to 3.	Conditional	https://ceds.ed.gov/element/000245	**TRT:**Score/value **DWSA:**AssessmentClaim3PerformanceLevelIdentifier **AIR:**PL_SRC3
Claim3Theta	xsd:float	8	The theta value for claim #1	Floating point number	Required for Validity Studies		**AIR:**THETA_SRC3
Claim3ThetaStandardError	xsd:float	8	Standard error for the claim 1 theta	Floating point number	Required for Validity Studies		**AIR:**SEM_THETA_SRC3
Claim4Score	xsd:float	8	Score for claim #4 For Smarter Balanced: ELA Claim 4 is Research/Inquiry Math does not use this value as claim 4 is combine with claim 2.	A positive number, typically an integer.	Conditional	https://ceds.ed.gov/element/000245	**TRT:**Score/value **DWSA:**AssessmentSubtestREsultScoreClaim4Value **AIR:**SS_SRC4
Claim4ScoreStandardError	xsd:float	8	Standard error for claim #4	Floating point number	Conditional	https://ceds.ed.gov/element/001546	**TRT:**Score/standardError **DWSA:**AssessmentSubtestResultScoreClaim4MinimumValue **AIR:**SEM_SRC4

Test Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	Cross Reference
Claim4ScoreAchievementLevel	xsd:integer	1	The achievement level corresponding to claim score #4.	For Smarter Balanced, claim achievement levels are 1 to 3.	Conditional	https://ceds.ed.gov/element/000245	**TRT:**Score/value **DWSA:**AssessmentClaim4PerformanceLevelIdentifier **AIR:**PL_SRC4
Claim4Theta	xsd:float	8	The theta value for claim #1	Floating point number	Required for Validity Studies		**AIR:**THETA_SRC4
Claim4ThetaStandardError	xsd:float	8	Standard error for the claim 1 theta	Floating point number	Required for Validity Studies		**AIR:**SEM_THETA_SRC4

Entity   Segment

Description   Information about one test segment.

Relationships   n:1 Segment to Test
1:n Segment to Item

Occurrence   One occurrence per test segment included in a test. Most Smarter Balanced tests have one segment which is either fixed-form or computer-adaptive.

Table 2: Segment Entity Fields

Segment Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	Cross Reference
SegmentId	xsd:token	40	Identifier for this test segment (unique per test)	One or more printable characters	Optional	https://ceds.ed.gov/element/000367	**TRT:**Segment/id (opt) **DWIL:**segmentId **AIR:**SegmentId (opt)
SegmentPosition	xsd:unsignedInt	8	Position of the segment on the test.	Positive 32-bit integer, null allowed	Optional		**TRT:**Segment/position (opt)
SelectionAlgorithm	xsd:token	40	Item selection algorithm that was used for this segment. ("Fixed" for a fixed-form segment.)	One or more printable characters	Optional		**TRT:**Segment/algorithm (opt)
SelectionAlgorithmVersion	xsd:token	40	Item selection algorithm version	One or more printable characters	Optional		**TRT:**Segment/algorithmVersion (opt)

Entity   Item

Description: Information about one test item.

Includes:

- Item information
- Student response

Relationships: n:1 Item to Segment
                           1:n Item to ResponseScore

Occurrence: One occurrence per item delivered to a student in a test session.

Table 3: Item Entity Fields

Item Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	AIR Proposed CSV
Item Information							
ItemID	xsd:token	40	Item ID. Typically assigned by item authoring. Original Smarter Balanced item IDs are in the form "\<bankKey\>-\<itemKey\>" e.g. "200-12345". Future IDs may be in GUID or other forms.	String of printable characters	Always	https://ceds.ed.gov/element/000630	**TRT:**Item/key Item/bankKey **DWIL:**key **AIR:**Item_ID
ItemPosition	xsd:unsignedInt	8	Ordinal position of item on test. E.g. 1 for the first item presented to the student.	Positive 32-bit integer	Always		**TRT:**Item/position **DWIL:**position **AIR:**ItemOrdr
FieldTest	xsd:token	3	Indicates that the assessment item is being field tested on this form of the test, and does not contribute to the test score.	Yes, No	Optional (defaults to "No")	https://ceds.ed.gov/element/001536	**TRT:**Item/operational **DWIL:**operational **AIR:**item_life_stage
Dropped	xsd:token	3	Indicates that the item was dropped from the test and is not to be included for scoring.	Yes, No	Optional (defaults to "No")		**TRT:**Item/dropped **DWIL:**dropped
ItemType	xsd:token	40	Item type (e.g. MC (multiple choice) or GI (grid item)).	EBSR, EQ, ER, GI, HT, HTQ, MC, MI, MS, NL, SA, TI, TUT, WER, WORDLIST, Stimulus	Optional	https://ceds.ed.gov/element/001158	**TRT:**Item/format **DWIL:**format **AIR:**Item_format
Student Response Information							
AdminDateTime	xsd:dateTime	23	Date and time item was administered to Examinee	YYYY-MM-DDTHH-MM-SS	Always	https://ceds.ed.gov/element/000959 https://ceds.ed.gov/element/000958	**TRT:**Item/adminDate
Submitted	xsd:token	3	Indicates whether the student submitted a response to this item	Yes,No	Optional (defaults to "Yes")		**TRT:**Item/isSelected **DWIL:**isSelected

Item Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	AIR Proposed CSV
SubmitDateTime	xsd:dateTime	23	Date and time the student submitted a response to the item.	YYYY-MM-DDTHH-MM-SS	Optional	https://ceds.ed.gov/element/000959 https://ceds.ed.gov/element/000958	**TRT:**Item/Response/date **DWIL:**adminDate
NumberOfVisits	xsd:unsignedInt	8	Number of times the student set or changed a response to the item	Integer 1 or greater	Optional		**TRT:**numberVisits (opt) **DWIL:**numberVisits **AIR:**NbrItemVisits (opt)
ResponseDuration	xsd:float	8	The total amount of time in seconds or milliseconds that a person spent responding to a given assessment item. When multiple items are on a page, the time on that page MAY be divided evenly among the items.[8]	Time spent in seconds. Decimals may express fractions of seconds.	Optional	https://ceds.ed.gov/element/000958	**TRT:**pageTime ÷ pageVisits
ResponseContentType	xsd:token	50	MIME type of item response. E.g. text/plain	One or more printable characters	Optional		**TRT:**Item/mimeType **AIR:**RespTypCd
ResponseValue	xsd:string	unlimited	The student's response to the item.		Online: Always	https://ceds.ed.gov/element/001063	**TRT:**Item/Response **AIR:**Response (opt)

Entity ResponseScore

Description   Represents a student's score for a test item.

Relationships   n:1 ItemScore to Item

Occurrence   Most items have a single score. However, certain items such as extended writing have scores in multiple dimensions. In those cases, there will be one ItemScore instance per dimension.

Table 4: ResponseScore Entity Fields

ResponseScore Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	AIR Proposed CSV
Score	xsd:float	8	The score given to a person's response to an assessment item.	unsigned float	Always	https://ceds.ed.gov/element/000724	**TRT:**Item/score **DWIL:**score **AIR:**ItemScore

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[8] A common type of analysis is to take the sum of time spent on items to estimate the time spent taking a test. Therefore, allocation of time to items SHOULD be done in such a way that taking the sum of times produces a reasonably accurate estimate of aggregate time (e.g. time on test or time on segment). Many test delivery systems can only measure time spent on a page, not time spent on an item. When multiple items are on a single page then the page time SHOULD be divided among the items. When there is a reading passage associated with a set of items, the time spent reading the passage SHOULD be divided among the associated items.

ResponseScore Field Name (TRT Field Name)	Data Type	Width (chars)	Description	Acceptable Values	Required	Reference	AIR Proposed CSV
ScoreDimension	xsd:token	0	Dimension name or code to which this score corresponds.	One or more printable characters. May be blank or omitted if the item has only one scoring dimension.	Required if item has more than one scoring dimension.		**TRT:**Item/ScoreInfo/ scoreDimension **AIR:**ScoringDimensio n (opt)
Rater1Score	xsd:float	8	The score given by hand scoring rater 1	Unsigned float	Required for Validity Studies	https://ceds.ed.gov/element/000724	**AIR:**Scr_Rater1
Rater1UserId	xsd:string	50	ID of the user who scored human-scored item	Alphanumeric ID up to 50 characters.	See Footnote[9]	https://ceds.ed.gov/element/001572	**TRT:**userId **AIR:**ID_Rater1 (opt)
Rater2Score	xsd:float	8	The score given by hand scoring rater 1	Unsigned float	Required for Validity Studies	https://ceds.ed.gov/element/000724	**AIR:**Scr_Rater2
Rater2UserId	xsd:string	50	ID of the user who scored human-scored item	Alphanumeric ID up to 50 characters.	See Footnote	https://ceds.ed.gov/element/001572	**TRT:**userId **AIR:**ID_Rater2 (opt)
Rater3Score	xsd:float	8	The score given by hand scoring rater 1	Unsigned float	Required for Validity Studies	https://ceds.ed.gov/element/000724	**AIR:**Scr_Rater2
Rater4UserId	xsd:string	50	ID of the user who scored human-scored item	Alphanumeric ID up to 50 characters.	See Footnote	https://ceds.ed.gov/element/001572	**TRT:**userId **AIR:**ID Rater3 (opt)
ScoreRationale	xsd:string	255	Rationale given by the human scorer. If multiple raters gave rational may be concatenated messages.	Printable text.	Optional		

[9] Rater IDs are required for validity studies; otherwise optional. In de-identified data, rater IDs must identify the actual person. For example, an email address would be inappropriate. A numeric ID would be acceptable. A keyed cryptographic hash like the one suggested for AlternateSSID could be used to obscure and ID that would otherwise be sensitive.

Appendix A: Test Results Transmission Format – Scores

The TRT format uses the <Score> element for all scores. In each case, the "value" attribute provides the score value and the "standardError" attribute indicates the standard error value. Scores are distinguished by the "measureOf" and "measureLabel" attributes according to the following table:

	measureOf	measureLabel
Overall test scale score	Overall	ScaleScore
Overall test achievement level	Overall	PerformanceLevel
Math Claim 1 scale score	1	ScaleScore
Math Claim 1 achievement level	1	PerformanceLevel
ELA Claim 1 scale score	SOCK_R	ScaleScore
ELA Claim 1 achievement level	SOCK_R	PerformanceLevel
Math Claim 2,4 scale score	SOCK_2	ScaleScore
Math Claim 2,4 achievement level	SOCK_2	PerformanceLevel
ELA Claim 2 scale score	2-W	ScaleScore
ELA Claim 2 achievement level	2-W	PerformanceLevel
Math Claim 3 scale score	3	ScaleScore
Math Claim 3 achievement level	3	PerformanceLevel
ELA Claim 3 scale score	SOCK_LS	ScaleScore
ELA Claim 3 achievement level	SOCK_LS	PerformanceLevel
ELA Claim 4 scale score	4-CR	ScaleScore
ELA Claim 4 achievement level	4-CR	PerformanceLevel

Appendix B: Omitted Fields

The following fields exist in the cross-referenced physical formats but have not been included in the data model. In many cases, the data is redundant with other fields. In other cases, they have been omitted because the fields have been inherited from previous projects but are not relevant to the Smarter Balanced test administration.

Fields in Test Results Transmission Format (TRT) but not in the data model

- Test/bankKey
- Test/handScoreProject (optional)
- Test/contract (optional)
- Examinee/key (optional)
- Examinee/isDemo (optional)
- ExamineeAttribute/Context
- ExamineeAttribute/ContextDate
- ExamineeRelationship/entityKey
- ExamineeRelationship/Context
- ExamineeRelationship/ContextDate
- Opportunity/TAName
- Accommodation/type
- Accommodation/value (code is the required indicator)
- Accommodation/segment (Smarter Balanced doesn't differentiate accommodations by segment)
- Score/measureLabel
- GenericVariable
- Item/clientId (optional)
- Item/scoreStatus
- Item/strand
- Item/contentLevel
- Item/pageNumber
- Item/pageVisits
- Item/pageTime
- Response/date (redundant with Item/adminDate)
- ScoreInfo
- SubScoreList
- Comment
- Score/conditionCode
- Score/type
- Score/userFirstName
- Score/userLastName
- ToolUsage
- ToolPage

Fields in Data Warehouse Student Assessment (DWSA) but not in the data model

- Group1Text to Group 10Text
- AssessmentSessionLocation
- AssessmentAdministrationFinishDate

Fields in Data Warehouse Item Level (DWIL) but not in the data model

- clientId
- scoreStatus
- strand
- contentLevel
- pageNumber
- pageVisits
- pageTime

Fields in American Institutes for Research CSV (AIR) but not in data model

- AssessmentSubtestResultDateCreated (Optional)
- GradeLevelWhenReported
- LanguageCode (Optional)
- TestMonitorEmailAddress (Optional)
- Num_Itms_TOT (Optional)
- AttemptednessIndicator Y=Attempted, N-Non-Participant, P=Participant
- Label_SRC1 (Optional)
- Num_Itms_SRC1 (Optional)
- Label_SRC2 (Optional)
- Num_Itms_SRC2 (Optional)
- Label_SRC3 (Optional)
- Num_Itms_SRC3 (Optional)
- Label_SRC4 (Optional)
- Num_Itms_SRC4 (Optional)
- Label_SRC5 (Optional)
- Num_Itms_SRC5 (Optional)
- THETA_SRC5 (Optional)
- SEM_THETA_SRC5 (Optional)
- SS_SRC5 (Optional)
- SEM_SRC5 (Optional)
- PL_SRC5 (Optional)
- Label_SRC6 (Optional)
- Num_Itms_SRC6 (Optional)
- THETA_SRC6 (Optional)
- SEM_THETA_SRC6 (Optional)
- SS_SRC6 (Optional)
- SEM_SRC6 (Optional)
- PL_SRC6 (Optional)
- Accommodations_Segment1 (Optional)
- SegmentID2 (Optional)
- Accommodations_Segment2 (Optional)
- SegmentID3 (Optional)
- Accommodations_Segment3 (Optional)
- AssessmentFormNumber (Optional)
- Scr_Rater1 (Optional) (Scores from each rater)
- Scr_Rater2 (Optional)
- Scr_Rater3 (Optional)
- CC_Rater1 (Optional) (Condition Code)
- CC_Rater2 (Optional)
- CC_Rater3 (Optional)
- CC_Reso (Optional)