**SMARTERAPP MAPPING**

**for**

**SAAIF to QTI**

Updated

02 June 2020

Revision History

|  |  |  |
| --- | --- | --- |
| Revision Description | Author/Modifier | Date |
| 0.1: Initial Release (DRAFT) | Alex Dean | April 2, 2020 |
| 0.2: Additional mapping information for Math items along with mapping information for metadata fields and response processing. | Alex Dean | June 2, 2020 |
| 0.3: Added the link to the QTI 3.0 specification | Alex Dean | January 29, 2021 |

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# Purpose

The purpose of this document is to provide a mapping of the SmarterApp Assessment Item Format (SAAIF) item format to QTI 3 format.

This specification represents the combined work of Smarter Balanced and various vendors working on related contracts.

# References

|  |  |  |  |
| --- | --- | --- | --- |
| Ref | Reference | Author | Version |
| 1 | SmarterApp Assessment Item Format (SAAIF) Specification  <http://www.smarterapp.org/documents/SmarterApp_Assessment_Item_Format_Specification.pdf> | AIR / Smarter Balanced | 1.10 |
| 2 | Smarter Balanced Item and Stimulus Metadata Specification  <http://www.smarterapp.org/documents/Item_Metadata_Specification.pdf> | Smarter Balanced | 1.0 |
| 3 | <https://www.imsglobal.org/spec/qti/v3p0/oview> | IMS Global | 3.0 |
| 4 | Sample Content  Example Set #3 (released 1/29/2021): <http://www.smarterapp.org/documents/QTI_ExampleSet3_QTI_20210129.zip> | Smarter Balanced | 3.0 |
| 5 | Smarter Balanced QTI 3 Custom Operators Reference  <http://www.smarterapp.org/documents/SmarterBalanced_QTI3_CustomOperatorsReference.pdf> | Pearson | 0.4 |

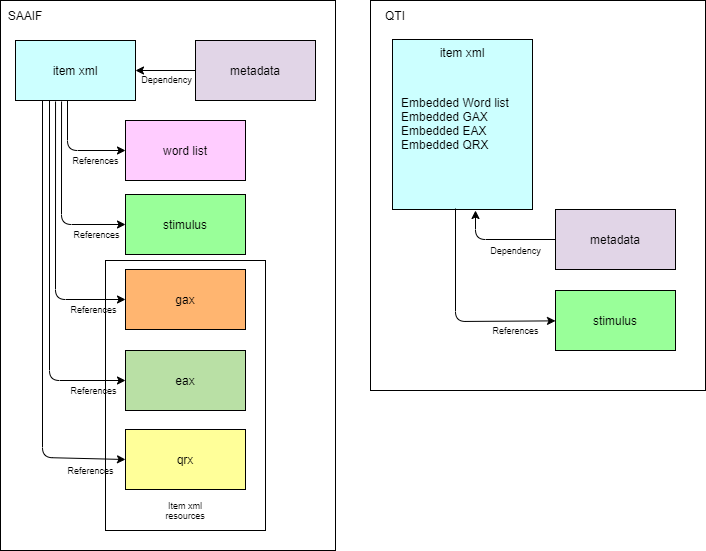
## Data Format Conventions

Table 2 provides information regarding the XML output format and its associated XSD, such as the allowable values, sizes, and descriptions, as well as any standards alignment.

The following conventions apply to Table 2 below:

* **Case sensitivity**: Field names are case sensitive and follow the guideline that the XML *Node/Element* is in UpperCamelCase, while node *attributes* are in lowerCamelCase.
* **Order sensitivity**: Fields are not order-sensitive.
* **Non-required (optional) fields**: By default, these fields do not need to be included in the XML file. A missing optional field is simply treated as not present or not applicable.
* **Cardinality**: The number of possible instances of a particular node is defined clearly in the XSD

# Relationship between SAAIF dependencies and QTI dependencies



# Item Element Mapping

| SAAIF Node  (XML Element) | SAAIF Node  (XML Attribute) | SAAIF XPath | QTI Node  (XML Element) | QTI Node  (XML Attribute) | QTI XPath | QTI Notes | Proposed Resolution of Differences for SAAIF  (refer to the Metadata specification for those relevant fields) |
| --- | --- | --- | --- | --- | --- | --- | --- |
| item | id | /itemrelease/item/@id | qti-assessment-item | identifier | /qti-assessment-item/@identifier | Format of item id:  sbac-item-200-123456 | Mapped |
| qti-assessment-item | title | /qit-assessment-item/@title | Format of item id:  SBAC Item 200-123456 | Mapped |
|  | format | /itemrelease/item/@format |  |  |  | QTI does not have a mapping of item format. The QTI specification includes item interaction type tagging. | Include in Metadata <InteractionType> field. |
|  | version | /itemrelease/item/@version |  |  |  |  | Include in Metadata  <Version> field. |
|  | bankkey | /itemrelease/item/@bankkey |  |  |  |  | Drop SAAIF Field |
| associatedpassage |  | /itemrelease/item/associatedpassage | qti-assessment-stimulus-ref | href | /qti-assessment-item/qti-assessment-stimulus-ref/@href | href attribute value is the relative path to the stimulus XML file | Mapped |
| attriblist/attrib/val | attid=’itm\_item\_id’ | /itemrelease/item/attriblist/attrib[@attid=’itm\_item\_id’]/val |  |  |  | QTI does not store the ITS ID of the item | Drop SAAIF Field |
| attriblist/attrib/val | attid=’itm\_item\_subject’ | /itemrelease/item/attriblist/attrib[@attid=’itm\_item\_subject’]/val |  |  |  | QTI does not store the subject value of the item | Include in Metadata  <Subject> field. |
| attriblist/attrib/val | attid=’itm\_item\_desc’ | /itemrelease/item/attriblist/attrib[@attid=’itm\_item\_desc’]/val |  |  |  | QTI does not store the short description of the item | Include in Metadata <SmarterAppItemDescription> field. |
| attriblist/attrib/val | attid=’itm\_FTUse’ | /itemrelease/item/attriblist/attrib[@attid=’itm\_FTUse’]/val |  |  |  | QTI does not store the field test use information | Drop SAAIF Field |
| attriblist/attrib/val | attid=’itm\_OPUse’ | /itemrelease/item/attriblist/attrib[@attid=’itm\_OPUse’]/val |  |  |  | QTI does not store the operational use information | Drop SAAIF Field |
| attriblist/attrib/val | attid=’itm\_att\_Answer Key’ | /itemrelease/item/attriblist/attrib[@attid=’itm\_att\_Answer Key’]/val | MC, MS, EBSR: qti-value  GI, EQ: qti-rubric-block |  | **MC**: /qti-assessment-item/qti-response-declaration[@base-type=’identifier’ @cardinality=’single’]/qti-correct-response/qti-value  **MS**: /qti-assessment-item/qti-response-declaration[@base-type=’identifier’ @cardinality=’multiple’]/qti-correct-response/qti-value  **EBSR**: /qti-assessment-item/qti-response-declaration[@base-type=’identifier’ @cardinality=’single’ identifier=’EBSR[1…n]’]/qti-correct-response/qti-value  **GI, EQ**: /qti-assessment-item/qti-item-body/qti-rubric-block[@view=’scorer’] | For **EBSR** items, the qti-response-declaration XML element is repeated for the number or answer options, where the value of the identifier attribute indicates which option number the answer is for. | Mapped |
| attriblist/attrib/val | attid=’itm\_att\_Grade’ | /itemrelease/item/attriblist/attrib[@attid=’itm\_att\_Grade’]/val |  |  |  | QTI does not store the grade level of the item | Include in Metadata <IntendedGrade> |
| attriblist/attrib/val | attid=’itm\_att\_Item Format’ | /itemrelease/item/attriblist/attrib[@attid=’itm\_att\_Item Format’]/val |  |  |  | QTI does not store the item format of the item | Include in Metadata <InteractionType> |
| attriblist/attrib/val | attid=’itm\_att\_Page Layout’ | /itemrelease/item/attriblist/attrib[@attid=’itm\_att\_Page Layout’]/val | qti-item-body |  | /qti-assessment-item/qti-item-body/div[@class='qti-layout-row']/div[@class='qti-layout']  NOTE: there may be additional class names in the <div> element that the XPath does not account for | The layout number in SAAIF is used as part of the class names for the <div> element surrounding the item content | Mapped |
| attriblist/attrib/val | attid=’itm\_att\_Response Type’ | /itemrelease/item/attriblist/attrib[@attid=’itm\_att\_Response Type’]/val |  |  |  | QTI does not store the response type of the item | Drop SAAIF Field |
| attriblist/attrib/val | attid=’itm\_att\_Item Point’ | /itemrelease/item/attriblist/attrib[@attid=’itm\_att\_Item Point’]/val | qti-outcome-declaration | normal-maximum | /qti-assessment-item/qti-outcome-declaration[@normal-maximum] |  | Mapped |
| attriblist/attrib/val | attid=’itm\_att\_Cloze Answers’ | /itemrelease/item/attriblist/attrib[@attid=’itm\_att\_Cloze Answers’]/val |  |  |  | QTI does not store the Cloze answers of the item | Drop SAAIF Field |
| attriblist/attrib/val | attid=’stm\_pass\_id’ | /itemrelease/item/attriblist/attrib[@attid=’stm\_pass\_id’]/val | qti-assessment-stimulus-ref | href | /qti-assessment-item/qti-assessment-stimulus-ref/@href | href attribute value is the relative path to the stimulus XML file | Mapped |
| attriblist/attrib/val | attid=’itm\_att\_Max Choices’ | /itemrelease/item/attriblist/attrib[@attid=’itm\_att\_Max Choices’]/val | qti-choice-interaction | max-choices | /qti-assessment-item/qti-item-body//qti-choice-interaction[@max-choices] |  | Mapped |
| attriblist/attrib/val | attid=’itm\_att\_Answer Key (Part II)’ | /itemrelease/item/attriblist/attrib[@attid=’itm\_att\_Answer Key (Part II)’]/val | qti-value |  | **EBSR**: /qti-assessment-item/qti-response-declaration[@base-type=’identifier’ @cardinality=’single’ identifier=’EBSR[1…n]’]/qti-correct-response/qti-value | For **EBSR** items, the qti-response-declaration XML element is repeated for the number options where the value of the identifier attribute indicates which option number the answer is for. | Mapped |
| attriblist/attrib/val | attid=’itm\_att\_Max Choices (Part II)’ | /itemrelease/item/attriblist/attrib[@attid=’itm\_att\_Max Choices (Part II)’]/val | qti-choice-interaction | max-choices | **EBSR**: /qti-assessment-item/qti-item-body//qti-choice-interaction[@max-choices] |  | Mapped |
| tutorial | id | /itemrelease/item/tutorial[@id] | qti-htm-content |  | /qti-assessment-item/qti-catalog-info/qti-catalog[@id=’stem-catalog-ref’]/qti-card[@support=’ext:sbac-tutorial’]/qti-card-entry/qti-html-content | The full tutorial content is stored in the QTI item | Mapped |
| resourceslist |  |  |  |  |  |  | Drop SAAIF Field |
| statistic |  |  |  |  |  |  | Drop SAAIF Field |
| MachineRubric | filename | /itemrelease/item/MachineRubric[@filename] | qti-response-processing |  | /qti-assessment-item/qti-response-processing | QRX file contents parsed and placed in QTI element | Mapped |
| RendererSpec | filename | /itemrelease/item/RendererSpec[@filename] | qti-custom-interaction | data-interaction-identifier[@=’sbac:equation’] | /qti-assessment-item/qti-item-body/…/qti-custom-interaction[@class=’sbac:equation’] | The EAX file is embedded in the qti-item-body content within CDATA of a <template> element. | Mapped |
| qti |  | /itemrelease/item/qti[@spec=’itembody’] | **MI**: qti-match-interaction |  | **MI**: /qti-assessment-item/qti-item-body//qti-match-interaction | The SAAIF qti element is mapped to the QTI-specific <qti-match-interaction> element | Mapped |
| stem |  | /itemrelease/item/content[@language=’ENU’]/stem  /itemrelease/item/content[@language=’ESN’]/stem | qti-item-body |  | /qti-assessment-item/qti-item-body  **TI**: /qti-assessment-item/qti-item-body//qti-custom-interation[@data-interaction-identifier=’sbac:table-item’] | HTML5 content placed natively in the QTI element. No need to encapsulated in CDATA.  Any images in the content are handled with HTML <img> tags, where the src attribute can be the relative image file, or the base64 encoded image.  MathML is natively embedded in the HTML content. Image representations of MathML is included with the following css classes: ‘qti-hidden sbac-mathml-svg’  For ‘ESN’ content, a separate item xml file is provided. The file name is identical to the ‘ENU’ version along with a prefix of ‘es-’ (ex: es-sbac-200-12345.xml).  **TI**: a custom interaction element for the table interaction is embedded in the qti-item-body content | Mapped |
| rubriclist |  | /itemrelease/item/content/rubriclist/rubric/val | qti-rubric-block |  | /qti-assessment-item/qti-item-body/qti-rubric-block/qti-content-body/p |  | Mapped |
| attachment | id | /itemrelease/item/content/attachmentlist/attachment[@id] |  |  | **ASL**: /qti-assessment-item/qti-catalog-info/qti-catalog/qti-card[@support=’sign-language’]/qti-card-entry/qti-html-content/video/source  **Braille Files**: /qti-assessment-item/qti-catalog-info/qti-catalog/qti-card[@support=’ext:sbac-braille-files’]/qti-card-entry[@data-type=[‘BRF’ or ‘PRN’]/qti-file-href[@mime-type=’application/braille’] | **Braille Files**: individual qti-card elements are created for each braille file | Drop SAAIF Field |
| attachment | type | /itemrelease/item/content/ attachmentlist/attachment[@type] | **ASL:** source  **Braille Files**: qti-card-entry | **ASL**: type  **Braille Files**: data-type | **ASL:** /qti-assessment-item/qti-catalog-info/qti-catalog/qti-card[@support=’sign-language’]/qti-card-entry/qti-html-content/video/source[@type=’video/webm’ or ‘video/mp4’]  **Braille Files**: /qti-assessment-item/qti-catalog-info/qti-catalog/qti-card[@support=’ext:sbac-braille-files’]/qti-card-entry | **ASL:** type attribute of the source element  **Braille Files**: In order to support the subtype, concatenate the type and subtype with a delimiter | Mapped |
| attachment | subtype | /itemrelease/item/content/ attachmentlist/attachment[@subtype] |  |  |  |  | **Braille Files**: Mapped with the type attribute |
| attachment | file | /itemrelease/item/content/ attachmentlist/attachment[@file] | **ASL:** source  **Braille Files**: qti-file-href | **ASL:** src  **Braille Files**: mime-type=’application/braille’ | **ASL:** /qti-assessment-item/qti-catalog-info/qti-catalog[@id=’stim-catalog-ref’]/qti-card[@support=’sign-language’]/qti-card-entry[@default=’true’ @lang=’ase’]/qti-html-content/video[@controls=’true’ height=’240’ width=’320’]/source[@type=’video/mp4’]  **Braille Files**: /qti-assessment-item/qti-catalog-info/qti-catalog[@id=’stem-catalog-ref’]/qti-card[@support=’ext:sbac-braille-files’]/qti-card-entry[@default=’true’ @lang=’en’]/qti-file-href[@mime-type=’application/braille’] | **ASL:** QTI stores the relative path from the root folder to the items in the video file  **Braille Files**: QTI stores the relative path from the root folder to the braille file | Mapped |
| audioShortDesc |  | /itemrelease/item/content[@language=’ENU’]/apipAccessibility/accessibilityInfo/accessElement[@identifier=’<internal content identifier token>’/contentLinkInfo[@itsLinkIdentifierRef=’<internal content identifier token 2>’]/relatedElementInfo/readAloud/audioShortDesc  /itemrelease/item/content[@language=’ESN’]/apipAccessibility/accessibilityInfo/accessElement[@identifier=’<internal content identifier token>’/contentLinkInfo[@itsLinkIdentifierRef=’<internal content identifier token 2>’]/relatedElementInfo/readAloud/audioShortDesc | qti-item-body |  | /qti-assessment-item/qti-item-body/…/span[@data-iat-tts=’<audio short desc text>’] | For ‘ESN’ content, a separate item xml file is provided. The file name is identical to the ‘ENU’ version along with a prefix of ‘es-’ (ex: es-sbac-200-12345.xml). | Mapped |
| audioText |  | /itemrelease/item/content[@language=’ENU’]/apipAccessibility/accessibilityInfo/accessElement[@identifier=’<internal content identifier token>’/contentLinkInfo[@itsLinkIdentifierRef=’<internal content identifier token 2>’]/relatedElementInfo/readAloud/audiotext  /itemrelease/item/content[@language=’ESN’]/apipAccessibility/accessibilityInfo/accessElement[@identifier=’<internal content identifier token>’/contentLinkInfo[@itsLinkIdentifierRef=’<internal content identifier token 2>’]/relatedElementInfo/readAloud/audioText | qti-item-body |  | /qti-assessment-item/qti-item-body/…/span[@data-iat-tts=’<audio text>’] | For ‘ESN’ content, a separate item xml file is provided. The file name is identical to the ‘ENU’ version along with a prefix of ‘es-’ (ex: es-sbac-200-12345.xml). | Mapped |
| textToSpeechPronunciation |  | /itemrelease/item/content[@language=’ENU’]/apipAccessibility/accessibilityInfo/accessElement[@identifier=’<internal content identifier token>’/contentLinkInfo[@itsLinkIdentifierRef=’<internal content identifier token 2>’]/relatedElementInfo/readAloud/textToSpeechPronunciation  /itemrelease/item/content[@language=’ESN’]/apipAccessibility/accessibilityInfo/accessElement[@identifier=’<internal content identifier token>’/contentLinkInfo[@itsLinkIdentifierRef=’<internal content identifier token 2>’]/relatedElementInfo/readAloud/textToSpeechPronunciation | qti-card-entry |  | /qti-assessment-item/qti-catalog-info/qti-catalog[@id=’item\_<internal id>\_Stem’]/qti-card[@support=’spoken’]/qti-card-entry[@data-reading-type=’computer-read-aloud’] | For ‘ESN’ content, a separate item xml file is provided. The file name is identical to the ‘ENU’ version along with a prefix of ‘es-’ (ex: es-sbac-200-12345.xml). | Mapped |
| textToSpeechPronunciationAlternate |  | /itemrelease/item/content[@language=’ENU’]/apipAccessibility/accessibilityInfo/accessElement[@identifier=’<internal content identifier token>’/contentLinkInfo[@itsLinkIdentifierRef=’<internal content identifier token 2>’]/relatedElementInfo/readAloud/textToSpeechPronunciationAlternate  /itemrelease/item/content[@language=’ESN’]/apipAccessibility/accessibilityInfo/accessElement[@identifier=’<internal content identifier token>’/contentLinkInfo[@itsLinkIdentifierRef=’<internal content identifier token 2>’]/relatedElementInfo/readAloud/textToSpeechPronunciationAlternate |  |  |  | QTI does not store this element | Drop SAAIF Field |
| brailleTextString |  | /itemrelease/item/content[@language=’ENU’]/apipAccessibility/accessibilityInfo/accessElement[@identifier=’<internal content identifier token>’/contentLinkInfo[@itsLinkIdentifierRef=’<internal content identifier token 2>’]/relatedElementInfo/brailleText/brailleTextString  /itemrelease/item/content[@language=’ESN’]/apipAccessibility/accessibilityInfo/accessElement[@identifier=’<internal content identifier token>’/contentLinkInfo[@itsLinkIdentifierRef=’<internal content identifier token 2>’]/relatedElementInfo/brailleText/brailleTextString | qti-card-entry |  | /qti-assessment-item/qti-catalog-info/qti-catalog/qti-card[@support=’spoken’]/qti-card-entry[@data-reading-type=’screen-reader’] | For ‘ESN’ content, a separate item xml file is provided. The file name is identical to the ‘ENU’ version along with a prefix of ‘es-’ (ex: es-sbac-200-12345.xml). | Mapped |

# Metadata Element Mapping

The item metadata XML file, as it exists with SAAIF content, is identical to the version for QTI content. There are some elements in the metadata file that are mapped to QTI item elements.

| SAAIF Metadata Node (XML Element) | SAAIF Metadata Node  (XML Attribute) | SAAIF Metadata XPath | QTI Node  (XML Element) | QTI Node  (XML Attribute) | QTI XPath | QTI Notes | Propsed Resolution of Differenced from SAAIF |
| --- | --- | --- | --- | --- | --- | --- | --- |
| AllowCalculator |  | /smarterAppMetadata/AllowCalculator | qti-calculator |  | /qti-assessment-item/qti-companion-materials-info/qti-calculator/qti-calculator-type | QTI stores the calculator type in the qti-calculator element. | Mapped |

# Word List Element Mapping

The word list mapping is done within the item itself, unlike for SAAIF where the word list exists as a separate item.

| SAAIF Node (XML Element) | SAAIF Node  (XML Attribute) | SAAIF XPath | QTI Node  (XML Element) | QTI Node  (XML Attribute) | QTI XPath | QTI Notes | Propsed Resolution of Differenced from SAAIF |
| --- | --- | --- | --- | --- | --- | --- | --- |
| keyword |  | /itemrelease/item/keywordList/keyword | qti-item-body |  | /qti-assessment-item/qti-item-body/…/span[@id=’glossary-term-<integer>’] | QTI stores word lists within the item XML The tagging id ‘glossary-term-<integer>’ is matched in the qti-catalog for the word list translations. | Mapped |
| html | listType  listCode | /itemrelease/item/keywordList/keyword/html[@listtype=<translation name>] | qti-card-entry | data-list-code  data-list-type | /qti-assessment-item/qti-catalog-info/qti-catalog[@id=<tagging id that is referenced in the prompt HTML>]/qti-card[@support=’keyword-translation’]/qti-card-entry |  | Mapped |
| html |  | /itemrelease/item/keywordList/keyword/html[@listtype=<translation name>] | qti-html-content | src | /qti-assessment-item/qti-catalog-info/qti-catalog[@id=<tagging id that is referenced in the prompt HTML>]/qti-card[@support=’keyword-translation’]/qti-card-entry[@data-list-type=<language translation>]/qti-html-content/p/audio/source | QTI stores word list translations within the item XML | Mapped |

# Stimulus Element Mapping

| SAAIF Node (XML Element) | SAAIF Node  (XML Attribute) | SAAIF XPath | QTI Node  (XML Element) | QTI Node  (XML Attribute) | QTI XPath | QTI Notes | Propsed Resolution of Differenced from SAAIF |
| --- | --- | --- | --- | --- | --- | --- | --- |
| passage | version | /itemrelease/passage/version |  |  |  | QTI does not store the version number of the item | Include in Metadata  <Version> field. |
|  | format | /itemrelease/passage/format |  |  |  | QTI does not store the format of the item | Include in Metadata  <StimulusFormat> field. |
|  | bankkey | /itemrelease/passage[@bankkey] |  |  |  |  | Drop SAAIF Field |
|  | id | /itemrelease/passage[@id] | qti-assessment-stimulus | title  identifier | /qti-assessment-stimulus[@title]  /qti-assessment-stimulus[@identifier] | Format of title:  123456  Format of @identifier:  sbac-200-123456 | Mapped  Include in Metadata  <Identifier> field |
| attriblist/attrib/val |  | /itemrelease/passage/attriblist/attrib[@attid=’stm\_pass\_id’]/val |  |  |  |  | Identical to passage/id field above.  Drop SAAIF field |
| attriblist/attrib/val |  | /itemrelease/passage/attriblist/attrib[@attid=’stm\_pass\_subject’]/val |  |  |  |  | Include in Metadata  <Subject> field |
| attriblist/attrib/val |  | /itemrelease/passage/attriblist/attrib[@attid=’stm\_pass\_desc’]/val |  |  |  |  | Drop SAAIF Field |
| attriblist/attrib/val |  | /itemrelease/passage/attriblist/attrib[@attid=’stm\_att\_Stim Format’]/val |  |  |  |  | Include in Metadata <StimulusFormat> field |
| stem |  | /itemrelease/passage/content[@language=’ENU’]/stem | qti-stimulus-body |  | /qti-assessment-stimulus/qti-stimulus-body | HTML5 content placed natively in the QTI element. No need to encapsulated in CDATA.  Any images in the content are handled with HTML <img> tags, where the src attribute can be the relative image file, or the base64 encoded image. | Mapped |
| textToSpeechPronunciation |  | /itemrelease/passage/content[@language=’ENU’]/apipAccessibility/accessibilityInfo/accessElement[@identifier=’<internal content identifier token>’/contentLinkInfo[@itsLinkIdentifierRef=’<internal content identifier token 2>’]/relatedElementInfo/readAloud/textToSpeechPronunciation | qti-card-entry |  | /qti-assessment-stimulus/qti-catalog-info/qti-catalog[@id=’item\_<internal id>\_Stem’]/qti-card[@support=’spoken’]/qti-card-entry[@data-reading-type=’computer-read-aloud’] |  | Mapped |
| brailleTextString |  | /itemrelease/passage/content[@language=’ENU’]/apipAccessibility/accessibilityInfo/accessElement[@identifier=’<internal content identifier token>’/contentLinkInfo[@itsLinkIdentifierRef=’<internal content identifier token 2>’]/relatedElementInfo/brailleText/brailleTextString | qti-card-entry |  | /qti-assessment-stimulus/qti-catalog-info/qti-catalog/qti-card[@support=’spoken’]/qti-card-entry[@data-reading-type=’screen-reader’] |  | Mapped |

# Response Processing Element Mapping

The machine scoring logic contained in a QRX file is embedded in the QTI item xml.

| SAAIF Node (XML Element) | SAAIF Node  (XML Attribute) | SAAIF XPath | QTI Node  (XML Element) | QTI Node  (XML Attribute) | QTI XPath | QTI Notes | Propsed Resolution of Differenced from SAAIF |
| --- | --- | --- | --- | --- | --- | --- | --- |
| responseDeclaration | baseType | /assessmentItem/responseDeclaration[@baseType] | qti-response-declaration | base-type | /qti-assessment-item/qti-response-declaration[@base-type] |  | Mapped |
|  | cardinality | /assessmentItem/responseDeclaration[@cardinality] |  | cardinality | /qti-assessment-item/qti-response-declaration[@cardinality] |  | Mapped |
|  | identifier | /assessmentItem/responseDeclaration[@identifier] |  | identifier | /qti-assessment-item/qti-response-declaration[@identifier] |  | Mapped |
| outcomeDeclaration | baseType | /assessmentItem/outcomeDeclaration[@baseType] | qti-outcome-declaration | base-type | /qti-assessment-item/qti-outcome-declaration[@base-type] |  | Mapped |
|  | cardinality | /assessmentItem/outcomeDeclaration[@cardinality] |  | cardinality | /qti-assessment-item/qti-outcome-declaration[@cardinality] |  | Mapped |
|  | identifier | /assessmentItem/outcomeDeclaration[@identifier] |  | identifier | /qti-assessment-item/qti-outcome-declaration[@identifier] |  | Mapped |
| value |  | /assessmentItem/outcomeDeclaration/defaultValue/value | qti-value |  | /qti-assessment-item/qti-outcome-declaration/qti-default-value/qti-value |  | Mapped |
| setOutcomeValue | identifier | /assessmentItem/responseProcessing/setOutcomeValue[@identifier] | qti-set-outcome-value | identifier | /qti-assessment-item/qti-response-processing/qti-set-outcome-value | identifier | Mapped |
| customOperator | functionName | /assessmentItem/responseProcessing/setOutcomeValue/customOperator[@functionName] | qti-custom-operator | class | /qti-assessment-item/qti-response-processing/qti-set-outcome-value/qti-custom-operator[@class]  /qti-assessment-item/qti-response-processing/qti-response-condition/qti-response-if/qti-custom-operator | The specific Smarter Balanced custom operator is declared in the class attribute and is in the form of a Java package name (ex: qti.sbac.customOperators.EQ.ISEQUIVALENT) [[1]](#footnote-1) | Mapped |
|  | response | /assessmentItem/responseProcessing/setOutcomeValue/customOperator[@response] | qti-custom-operator | definition | /qti-assessment-item/qti-response-processing/qti-set-outcome-value/qti-custom-operator[@definition]  /qti-assessment-item/qti-response-processing/qti-response-condition/qti-response-if/qti-custom-operator[@defintion] | In the <qti-custom-operator> element, the @defintion attribute contains the scoring logic needed for the Smarter Balanced custom operator [[2]](#footnote-2) | Mapped |
|  | type | /assessmentItem/responseProcessing/setOutcomeValue/customOperator[@type] |  |  |  | Used in the qti-custom-operator @class attribute value package name | Mapped |
| index | n | /assessmentItem/responseProcessing/setOutcomeValue/index[@n] | qti-index | n | /qti-assessment-item/qti-response-processing/qti-set-outcome-value/qti-index[@n] |  | Mapped |
| variable | identifier | /assessmentItem/responseProcessing/setOutcomeValue/index/variable[@identifier] | qti-variable | Identifier | /qti-assessment-item/qti-response-processing/qti-set-outcome-value/qti-index/qti-variable |  | Mapped |
| responseCondition |  | /assessmentItem/responseProcessing/responseCondition | qti-response-condition |  | /qti-assessment-item/qti-response-processing/qti-response-condition | The response condition logic is set within the <qti-response-condition> element, including any <qti-custom-operator> | Mapped |

1. Refer to the Smarter Balanced QTI3 Custom Operators Reference document for listing and useage of custom operators. [↑](#footnote-ref-1)
2. Refer to the Smarter Balanced QTI3 Custom Operators Reference document for listing and useage of custom operators. [↑](#footnote-ref-2)