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| NSW Board of Studies RDF Specification | |
| **Specification of format and conventions for RDF encoding of the NSW Board of Studies** | |
| Report prepared by Education Services Australia Ltd | |
| Version 1.0 | 2013–02–22 |

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Release Note

This release of the NSW Board of Studies Machine Readable Curriculum specification is aligned with version 3.0 of the Australian Curriculum RDF specification.

Approvals

|  |  |  |  |
| --- | --- | --- | --- |
| Name/Position | Document role | Signature | Date |
| Nick Nicholas  Business Analyst | Author |  |  |
|  |  |  |  |
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References

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| 31/06/2012 | 3.0 | Australian Curriculum RDF Specification | Nick Nicholas |
| 12/06/2012 | 3.0 | Achievement Standards Network Application Profile  http://standards.jesandco.org/wiki/ASN\_Application\_Profile | Achievement Standards Network |
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# Background

The NSW Board of Studies Syllabus is being published in machine readable form, in RDF/XML. This uses Semantic Web technologies for an extensible encoding of metadata, expressed through relations between URLs. The framework allows more flexibility in describing curricula than would databases or traditional XML schemas. Identifying each curriculum objective through an unambiguous persistent URL opens up several possibilities, including

* lookup of curriculum outcomes,
* hyperlinking from other documents,
* tagging of learning assets,
* navigation of curriculum outcomes online,
* version control.

The approach is already proving useful in ESA initiatives, and is a prerequisite for ESA’s procedures in aligning curriculum to learning resources, whether via LOM metadata or ScOT terms.

The machine readable curriculum uses the RDF application profile produced by the Achievement Standards Network. This application profile has been used for several years to describe curricula in all fifty US states, and has formed the basis for much activity in lesson planning and learning asset metadata. It is also the framework used for the Machine Readable form of the Australian Curriculum, implemented by ESA.

While RDF is conceptually more flexible than more established XML approaches, RDF is still expressed in XML, and can be processed through familiar XML tools. The Machine Readable Syllabus can readily be mapped into formats that jurisdiction systems are already familiar with. The information model of the RDF application profile is closely aligned with SIF’s model of curricula, so SIF can readily be used to distribute the Australian Curriculum into jurisdictions.

The format also allows alignments to be expressed between different machine readable curricula. In particular, RDF can specify the relation between Australian Curriculum content descriptions, and the BoS Syllabus content descriptions derived from them—whether for instance the two are identical, narrower in scope, or broader in scope.

# Purpose

This document provides a specification for the RDF encoding of the Board of Studies Syllabus. It is intended for technically-oriented users of the machine readable BoS Syllabus, who wish to extract and make use of the information encoded in the RDF.

# Scope

This specification encompasses:

* The underlying information model for the BoS Syllabus
* The representation of the BoS Syllabus in Machine-Readable RDF/XML
* The serialisation of the BoS Syllabus RDF/XML in manifest files, as RDF/JSON
* The localisations done to the Achievement Standards Network Application Profile for representing the BoS Syllabus as RDF/XML
* The use of added vocabularies to express the BoS Syllabus
* Conventions for expressing spatial and temporal coverage in the BoS Syllabus
* The conventions for expressing General capabilities, Cross-curriculum priorities, and Other learning across curriculum areas in the BoS Syllabus
* The treatment of textual content in the Machine-Readable BoS Syllabus
* The treatment of versioning in the Machine-Readable BoS Syllabus
* How properties of the BoS Syllabus may be extended

The following are out of scope of this specification:

* The representation of the structure of future releases of the BoS Syllabus, where this may vary from the structure of the subject areas of the current BoS Syllabus
* The textual content of prefatory material to the BoS Syllabus (deliberately excluded)
* Including versioning information for the BoS Syllabus in Syllabus URIs

# Information Model

The BoS Syllabus has a hierarchical structure for the statements it contains, which needs to be represented in any machine readable representation. The current structure of the BoS Syllabus, and any associated constraints, are outlined below; refer to <http://www.australiancurriculum.edu.au/Curriculum/Overview> for further information.

* Curriculum document
  + 1: Learning Area (*English, Mathematics, Science and Technology, History, etc*). NOTE: learning areas are treated atomically within the syllabus; so Science and Technology will be conventionally treated as a single learning area.
  + 1: Prefatory and Concluding Material
    - 1: Introduction
    - 1: <Subject> key
    - 1: Rationale
    - 1: The place of the <subject> K–10 syllabus in the K–12 curriculum
    - 1: Aim
    - 1: Objectives
    - 1: Outcomes
    - 1: Stage statements
    - 1: Organisation of content
    - 1: Years 7–10 Life Skills outcomes and content
    - 1: Assessment
    - 1: Glossary
  + 1: Curriculum Statements
    - 1..\* Stage (2 Year Levels grouped together)
    - 1..\* Strands (which may differ from AC strands)
    - 1..\* Intermediate Groupings (called “Content groups”)
    - 1..\* Outcomes
    - 1..\* Content Descriptions (*content descriptions are categorised as three different types: label, BoS and ACARA*)
      * Label Content descriptions are used for presentation purposes, and do not have educational meaning attached to them
      * ACARA Content Descriptions are derived from Content Descriptions within the Australian Curriculum, and have an associated Australian Curriculum Content Description code; however they may be broader or narrower in scope
      * BoS Content Descriptions are specific to the Board of Studies, and are not based on ACARA Content Descriptions
    - 1..\* 2nd level Content Descriptions
    - 1..\* 3rd level Content Descriptions
    - 1..\* 4th level Content Descriptions (children of 2nd level CDs)
  + 1..\*: General Capabilities
  + 1..\*: Cross-Curriculum Priorities
  + 1..\*: Other learning across the curriculum areas

The curriculum statements are organised in the following hierarchy:

* Every level 4 content description is the child of a level 2 content description
* Every level 3 content description is the child of a level 2 content description
* Every level 2 content description is the child of ONE OR MORE level 1 content descriptions
* Every content description is the descendant of a year level
* Every outcome is the child of ONE OR MORE intermediate groupings
* NOT every intermediate grouping is the descendant of a strand (History does not have strands)
* Every content description is the child of an intermediate grouping
* Within learning areas, intermediate groupings may be grouped together in various strands. The name of intermediate groupings may vary within a learning area but are broadly consistent.
* Intermediate groupings, called “content groups” may have child “content groups”
* Content descriptions may or may not relate to one or more general capabilities
* Content descriptions may or may not relate to one or more cross-curriculum priorities
* Currently general capabilities and cross-curriculum priorities are atomic.

Note that the hierarchy is not a tree: nodes in the graph can have multiple parents and ancestors, as well as multiple children and descendants.

Outcomes and content descriptions share equal importance in the NSW Syllabus. The curriculum is presented as a hierarchy of content descriptions grouped with outcomes in intermediate groupings called “content groups”. Lower-level content descriptions are intended as clarifications of higher-level content descriptions, but are still compulsory to be taught in NSW.

The following is one possible organisation of curriculum statements within a learning area in the AC; there are others.



And the comparison to NSW Syllabus organisation of content.

Content groups are intermediate groupings, and may be similar across stages, thereby similar to Australian Curriculum substrands (English in Primary, Mathematics throughout, Science throughout, History not at all).

The diversity of names for groupings of curriculum statements within a curriculum is pervasive. For that reason, machine-readable representations of curricula, including SIF and ASN, are agnostic about intermediate levels of groupings within a curriculum, and do not strongly type them or differentiate them from each other.

## Competencies

Certain curricula organise content descriptions according to competencies as well as content. These ways of organising the curriculum have been encoded as competencies associated with content descriptions, rather than as hierarchical organisations of content descriptions. For example, Mathematics has *proficiency strands* applicable across the curriculum, alongside *content strands*. The content descriptions are organised under content strands. The proficiency strands are currently defined for each level in the year level description, but individual content descriptions are not aligned to proficiency strands.

However, other subjects such as Science have chosen to express skills strands as the content strand “Working Scientifically”.

## Outcomes

Unlike the Australian Curriculum, Outcomes and Content Descriptions are both prioritised as the focus of teaching, and of associated resource discovery. For that reason, each Outcome has associated metadata which other curriculum statements lack (Content Descriptions excepted):

* ScOT keywords
* Spatial coverage (NOT currently in NSW syllabus)
* Temporal coverage (NOT currently in NSW syllabus)

Only outcomes have statement notation codes (short letter + number identifiers, such as *ENe‑1A, MA5.1-1WM* and *HI4-1*). The first two letters are the subject code, followed by the stage identifier. A hyphen then separates the outcome number, followed by a strand identifier where applicable.

## Content Descriptions

Content descriptions are a locus of resource alignment, and as such have certain associated metadata which other curriculum statements lack (Outcomes excepted):

* ScOT keywords
* Spatial coverage (NOT currently in NSW syllabus)
* Temporal coverage (NOT currently in NSW syllabus)
* General capabilities
* Cross-curriculum priorities
* Other learning across the curriculum areas

Most BoS Syllabus Content Descriptions are derived from Australian Curriculum Content Descriptions. The derivation is indicated by including the code of the Australian Curriculum Content Description in the BoS Syllabus Content Description. BoS Syllabus Content Descriptions are not identical to Australian Curriculum Content Description: they may be reworded, and they may be broader or narrower in scope, with more or less associated ScOT keywords than their Australian Curriculum counterparts.

Some BoS Syllabus Content Descriptions are not derived from Australian Curriculum Content Descriptions, and as such do not have associated Australian Curriculum Content Descriptions codes.

The BoS Syllabus Content Descriptions do not have codes of their own. However for the machine readable curriculum they are assigned distinct identifiers for internal use.

Resource discovery is focused against one level of Content Description by default. For most learning areas, this is Level 1; hence ScOT terms are assigned to Content Descriptions at Level 1. For English, Level 1 Content Description are used as headings and organisers, and discovery is focused against Level 2 Content Descriptions instead.

# RDF/XML Specification

The coding of the BoS Syllabus in RDF follows the Achievement Standards Network (ASN) application profile <http://www.achievementstandards.org/documentation/ASN-AP.htm> as used in the specification of the Machine Readable Australian Curriculum, except as documented below. Refer to the ASN-AP for definitions of the properties used below. The ASN-AP is not a formal ontology, but it does specify the cardinality, domain and range of properties in the RDF through RDF Schema.

The ASN information model distinguishes between two entities: documents, and standards. Standards belong to a document, and standards may have other standards as children. In the information model given above, documents correspond to the curriculum document with its prefatory material; statements correspond to all the curriculum statements given within the document, and all their higher-level groupings, including strands and year levels.

The ordering of statements in the RDF is not significant. Following the ASN-AP, a manifest file, expressed in JSON, reproduces the RDF with order significant; the manifest file is also included in the machine readable curriculum.

General capabilities, cross-curriculum priorities and other learning areas do not fit in the ASN-AP standards tree model, as they span across standards; their encoding is discussed separately.

## Conventions

In the RDF templates in this section, variables are indicated as follows:

* *URI(entity)* : persistent identifiers for an entity.
* *DATE(x)* : the date of event x in ISO 8601. For example:
  + DATE(copyright of national curriculum) = 2010
  + DATE(curriculum valid) = 2010-01-01/P3Y (three years from 2010)
* *TEXT(x)* : text describing x

## Document

### StandardDocument

Documents (asn:StandardDocument) are defined as the things for which properties such as Author and Publisher make sense (a body of curriculum statement with a single authority and intent behind them); they need not correspond to discrete physical documents published by a curriculum authority. They should make sense as a root for navigating standards, and have a reasonably coherent structure of curriculum statements under them.

In view of the quite different approach taken to K-10 and senior level curriculum in the Australian Curriculum and the Board of Studies Syllabus, the K-10 and senior level curricula are treated in their machine readable form as separate Curriculum Documents, independent of how they have been physically published.

The prefatory and concluding material associated with curriculum documents is linked external to the RDF document, rather than being included inline in the RDF. All introductory material by default, including Introduction, key, rationale, aim, objective, outcomes, stage statements, organisation, assessment, are coded as dc:abstract (which is a subproperty of dc:description). The JSON manifest for the file (in which ordering is significant) is attached as dc:tableOfContents. The glossary is not currently in scope of the machine-readable curriculum.

The metadata contained in the Curriculum Document RDF relates to the curriculum itself, and not to the machine codable form of the document. For example, dc:modified indicates when the curriculum was last updated from the Board of Studies, not when the RDF was last updated.

The template for Curriculum Documents is as follows:

<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:gemq="http://purl.org/gem/qualifiers/" xmlns:asn="http://purl.org/ASN/schema/core/" xmlns:loc="http://www.loc.gov/loc.terms/relators/" xmlns:dcterms="http://purl.org/dc/terms/" xmlns:foaf="http://xmlns.com/foaf/0.1/" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">

<asn:StandardDocument rdf:about="*URI(Curriculum)* ">

<asn:Jurisdiction rdf:resource="http://purl.org/ASN/scheme/ASNJurisdiction/AU-NSW"/>

<dc:language rdf:resource="http://id.loc.gov/vocabulary/iso639-2/eng"/>

<dc:rights>*TEXT(rights*)</dc:rights>

<dc:rightsHolder rdf:resource=" http://www.boardofstudies.nsw.edu.au/"/>

<asn:publicationStatus rdf:resource="http://purl.org/ASN/scheme/ASNPublicationStatus/Published"/>

<dc:publisher rdf:resource=" http://www.boardofstudies.nsw.edu.au/"/>

<dc:source>*TEXT(where this curriculum came from—i.e. the Board of Studies web site for this curriculum document)</*dc:source>

<dc:modified>*DATE(Curriculum:changed)</*dc:modified>

<dc:subject rdf:resource="*URI(learning area 1, out of http://vocabulary.curriculum.edu.au/AUScurriculumStrand)">*

...

<dc:subject rdf:resource="*URI(learning area n, out of http://vocabulary.curriculum.edu.au/AUScurriculumStrand)*">

*<!-- IF CURRICULUM:TYPE = K-10 -->*

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/0"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/1"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/2"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/3"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/4"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/5"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/6"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/7"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/8"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/9"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/10"/>

*<!-- ELSE IF CURRICULUM:TYPE = SENIOR -->*

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/11"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/12"/>

*<!-- END IF -->*

<dc:abstract>*URI(introduction)*</dc:description>

<dc:abstract>*URI(key)*</dc:abstract>

<dc:abstract>*URI(rationale)*</dc:abstract>

<dc:abstract>*URI(place in curriculum)*</dc:abstract>

<dc:abstract>*URI(aim)*</dc:abstract>

<dc:abstract>*URI(objectives)*</dc:abstract>

<dc:abstract>*URI(outcomes)*</dc:abstract>

<dc:abstract>*URI(stage statements)*</dc:abstract>

<dc:abstract>*URI(organisation of content)*</dc:abstract>

<dc:abstract>*URI(life skills)*</dc:abstract>

<dc:abstract>*URI(assessment)*</dc:abstract>

<dc:tableOfContents>*URI(JSON manifest*)</dc:tableOfContents>

*<!-- Ordering is significant in JSON Manifest -->*

<gemq:hasChild rdf:resource="*URI(Strand 1*)"/>

...

<gemq:hasChild rdf:resource="*URI(Strand n*)"/>

<gemq:hasChild rdf:resource="*URI(Stage 1*)"/>

...

<gemq:hasChild rdf:resource="*URI(Stage n*)"/>

</asn:StandardDocument>

</rdf:RDF>

### Machine Readable form of StandardDocument

As indicated, asn:StandardDocument contains metadata about the curriculum itself, as opposed to metadata about the RDF; in the case of the Australian Curriculum for example, ACARA is the author of the curriculum, but ESA creates the RDF encoding of the curriculum. The RDF document itself can be described using the following template:

<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:asn="http://purl.org/ASN/schema/core/" xmlns:loc="http://www.loc.gov/loc.terms/relators/" xmlns:dcterms="http://purl.org/dc/terms/" xmlns:foaf="http://xmlns.com/foaf/0.1/"   
xmlns:cc="http://creativecommons.org/ns#" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">

<rdf:Description rdf:about="*URI(NSW Board of Studies Syllabus Document RDF filename)*">

<foaf:primaryTopic rdf:resource="*URI(NSW Board of Studies Syllabus Document identifier)*"/>

<dcterms:rightsHolder xml:lang="en-AU">*NSW Board of Studies* </dcterms:rightsHolder>

<dcterms:creator xml:lang="en-AU"> *NSW Board of Studies*</dcterms:creator>

<dcterms:modified rdf:datatype="http://www.w3.org/2001/XMLSchema#date">*DATE(RDF document modified)*</dcterms:modified>

<dcterms:created rdf:datatype="http://www.w3.org/2001/XMLSchema#date">*DATE(RDF document created)*</dcterms:created>

<cc:license rdf:resource="*URI(Licence for the RDF encoding of the NSW Board of Studies Syllabus)"/>*

<cc:attributionURL rdf:resource="*URI(NSW Board of Studies Syllabus Document identifier, as URI to include in rights attribution)"/>*

<cc:attributionName xml:lang="en-AU">*NSW Board of Studies*</dcterms:creator>

<asn:exportVersion rdf:resource="http://purl.org/ASN/export/3.1.0"/>

</rdf:Description>

</rdf:RDF>

For example, in the Australian Curriculum, the English Curriculum has the identifier <http://www.australiancurriculum.edu.au/Elements/7f6bd186-fcdf-4e46-a727-9e4600a2a39b> , which is where the description of the curriculum itself can be found. <asn:StandardDocument rdf:about="7f6bd186-fcdf-4e46-a727-9e4600a2a39b"> introduces a description of the English Curriculum. <rdf:Description rdf:about="7f6bd186-fcdf-4e46-a727-9e4600a2a39b.rdf"> introduces a description of the English Curriculum RDF file.

## Statement

Levels of statement intermediate between the curriculum document and the content description are coded as curriculum statements (asn:Statement). We will not specify the internal structure of curriculum statement groupings, which the RDF is agnostic about. We will however assume a top-level structure of stages and strands, which is common to all NSW Board of Studies Syllabus statements published to date.

### Strand

Strands do not link directly to content descriptions; their child nodes are intermediate groupings.

<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:gemq="http://purl.org/gem/qualifiers/" xmlns:asn="http://purl.org/ASN/schema/core/" xmlns:loc="http://www.loc.gov/loc.terms/relators/" xmlns:dcterms="http://purl.org/dc/terms/" xmlns:foaf="http://xmlns.com/foaf/0.1/" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">

<asn:Statement rdf:about="*URI(Strand id)">*

<dcterms:isPartOf rdf:resource="*URI(Curriculum Document)*">

<asn:authorityStatus rdf:resource="http://purl.org/ASN/scheme/ASNAuthorityStatus/Original"/>

*<!—Authority Status “derived” is used by third parties -->*

<dc:modified>*DATE(Strand changed)*</dc:modified>

<asn:indexingStatus rdf:resource="http://purl.org/ASN/scheme/ASNIndexingStatus/No" />

*<!-- Only index statements associated with resource discovery -->*

<asn:statementLabel xml:lang="en-AU">Strand</asn:statementLabel>

<dc:description>*TEXT(Strand description)*

*<!-- Description is mandatory in ASN-AP, but can be a placeholder if not provided from source -->*

</dc:description>

<dc:subject rdf:resource="*URI(learning area, out of http://vocabulary.curriculum.edu.au/AUScurriculumStrand)*"/>

<dc:rights>*TEXT(rights)*</dc:rights>

<dc:rightsHolder rdf:resource=" http://www.boardofstudies.nsw.edu.au "/>

*<!—Strands normally cut across multiple year levels; the following are F-10 -->*

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/0"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/1"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/2"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/3"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/4"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/5"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/6"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/7"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/8"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/9"/>

<dc:educationLevel rdf:resource="http://vocabulary.curriculum.edu.au/schoolLevel/10"/>

<gemq:isChildOf rdf:resource="*URI(Curriculum:id)*"/>

*<!-- ordering is significant in JSON (Manifest) -->*

<gemq:hasChild rdf:resource="*URI(Intermediate Grouping 1)*"/>

...

<gemq:hasChild rdf:resource="*URI(Intermediate Grouping n)*"/>

</asn:Statement>

</rdf:RDF>

### Stages

Stages (or Curriculum Levels) do not link directly to content descriptions; their child nodes are intermediate groupings.

Stages conflate two year levels together. The year levels to which the stage applies are indicated through dc:educationLevel.

<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:gemq="http://purl.org/gem/qualifiers/" xmlns:asn="http://purl.org/ASN/schema/core/" xmlns:loc="http://www.loc.gov/loc.terms/relators/" xmlns:dcterms="http://purl.org/dc/terms/" xmlns:foaf="http://xmlns.com/foaf/0.1/" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema">

<asn:Statement rdf:about="*URI(Stage id)*">

<dcterms:isPartOf rdf:resource="*URI(Curriculum Document)*">

<dc:title>*TEXT(Stage name)*</dc:title>

<asn:authorityStatus rdf:resource="http://purl.org/ASN/scheme/ASNAuthorityStatus/Original"/>

*<!—Authority Status “derived” is used by third parties -->*

<dc:modified>*DATE(Stage changed)*</dc:modified>

<asn:indexingStatus rdf:resource="http://purl.org/ASN/scheme/ASNIndexingStatus/No" />

*<!-- Only index statements associated with resource discovery -->*

<asn:statementLabel xml:lang="en-AU">Stage</asn:statementLabel>

<dc:description>

*TEXT(Stage preface)*

</dc:description>

<dc:subject rdf:resource="*URI(learning area, out of http://vocabulary.curriculum.edu.au/AUScurriculumStrand )*"/>

<dc:rights>*TEXT(rights if any)*</dc:rights>

<dc:rightsHolder rdf:resource=" http://www.boardofstudies.nsw.edu.au "/>

<dc:educationLevel rdf:resource="*URI(first year level out of http://vocabulary.curriculum.edu.au/AUSschoolYearLevel)*"/>

<dc:educationLevel rdf:resource="*URI(second year level out of http://vocabulary.curriculum.edu.au/AUSschoolYearLevel)*"/>

<gemq:isChildOf rdf:resource="URI(Curriculum:id)"/>

*<!-- ordering is significant in JSON (Manifest) -->*

<gemq:hasChild rdf:resource="*URI(Intermediate Grouping 1)*"/>

...

<gemq:hasChild rdf:resource="*URI(Intermediate Grouping n)*"/>

</asn:Statement>

</rdf:RDF>

### Intermediate Grouping

The default intermediate grouping for the NSW Board of Studies Syllabus are Content groups.

Intermediate groupings can have multiple parent nodes, as well as multiple child nodes. Content groups are the child of both a Strand and a Strand (e.g. “Stage 3 Literacy” within English). Content groups by default have as children one or more Outcomes, and one or more Level 1 Content Descriptions. In History, Intermediate groupings can have both outcomes and other Intermediate groupings as children.

<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:gemq="http://purl.org/gem/qualifiers/" xmlns:asn="http://purl.org/ASN/schema/core/" xmlns:loc="http://www.loc.gov/loc.terms/relators/" xmlns:dcterms="http://purl.org/dc/terms/" xmlns:foaf="http://xmlns.com/foaf/0.1/" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">

<asn:Statement rdf:about="*URI(Intermediate Grouping id)*">

<dcterms:isPartOf rdf:resource="*URI(Curriculum Document)*">

<asn:authorityStatus rdf:resource="http://purl.org/ASN/scheme/ASNAuthorityStatus/Original"/>

*<!—Authority Status “derived” is used by third parties -->*

<dc:modified>*DATE(Intermediate Grouping changed)*</dc:modified>

<asn:indexingStatus rdf:resource="http://purl.org/ASN/scheme/ASNIndexingStatus/No" />

*<!-- Only index statements associated with resource discovery -->*

<asn:statementLabel xml:lang="en-AU">*TEXT(Intermediate Grouping name)*</asn:statementLabel>

<dc:description>

*TEXT(Intermediate Grouping preface)*

</dc:description>

<dc:subject rdf:resource="*URI(learning area, out of http://vocabulary.curriculum.edu.au/AUScurriculumStrand)*"/>

<dc:rights>*TEXT(rights if any)*</dc:rights>

<dc:rightsHolder rdf:resource=" http://www.boardofstudies.nsw.edu.au "/>

<dc:educationLevel rdf:resource="*URI(year level out of http://vocabulary.curriculum.edu.au/AUSschoolYearLevel)*"/>

<gemq:isChildOf rdf:resource="*URI(Statement 1)*"/>

...

<gemq:isChildOf rdf:resource="*URI(Statement n*)"/>

*<!-- ordering is significant in JSON (Manifest) -->*

<gemq:hasChild rdf:resource="*URI(Intermediate Grouping or Content Description 1 or Outcome 1)*"/>

...

<gemq:hasChild rdf:resource="*URI(Intermediate Grouping or Content Description n or Outcome n)*"/>

</asn:Statement>

</rdf:RDF>

### Outcomes

An outcome may be the child of multiple intermediate groupings. However to date, the syllabus has been so organised that it has only been the child of a single intermediate grouping.

The ways of encoding temporal and spatial coverage are described below. Issues with general capabilities, other areas, and cross-curriculum priorities are described below.

The relation between an outcome and related content descriptions is important for discovery of resources related to the outcome. While a direct relation between outcome and content descriptions can be encoded (e.g. through dc:relation), at this stage a content description is considered to be related to an outcome if the parent of the outcome is the ancestor of the content description. In the following diagram, all content descriptions are related to the outcome in this way.

The relation described between outcomes and their related content descriptions can be inferred through the following SPARQL query, which restricts content descriptions to those tagged as indexable (which we use to indicate that they are of interest in resource discovery):

PREFIX gemq: <<http://purl.org/gem/qualifiers/>>

PREFIX asn: <http://purl.org/ASN/schema/core/>

SELECT ?outcome ?contentdescription

WHERE {

?x gemq:hasChild ?outcome .

?outcome asn:statementLabel "Outcome"@en-AU .

?x gemq:hasChild+ ?contentdescription .

?contentdescription asn:statementLabel "Content description"@en-AU .

?contentdescription asn:indexingStatus <<http://purl.org/ASN/scheme/ASNIndexingStatus/Yes>> .

}



<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:gemq="http://purl.org/gem/qualifiers/" xmlns:asn="http://purl.org/ASN/schema/core/" xmlns:loc="http://www.loc.gov/loc.terms/relators/" xmlns:dcterms="http://purl.org/dc/terms/" xmlns:foaf="http://xmlns.com/foaf/0.1/" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">

<asn:Statement rdf:about="*URI(Outcome id)*">

<dcterms:isPartOf rdf:resource="*URI(Curriculum Document)*">

<asn:authorityStatus rdf:resource="http://purl.org/ASN/scheme/ASNAuthorityStatus/Original"/>

*<!—Authority Status “derived” is used by third parties -->*

<dc:modified>*DATE(Outcome changed)*</dc:modified>

<asn:indexingStatus rdf:resource="http://purl.org/ASN/scheme/ASNIndexingStatus/Yes" />

*<!-- Only index statements associated with resource discovery -->*

<asn:statementLabel xml:lang="en-AU">Outcome</asn:statementLabel>

<asn:statementNotation>*TEXT(Outcome code)* </asn:statementNotation>

*<!-- The statement notation is whatever human readable identifier is in common use for the curriculum statement, such as the alphanumeric codes already used by BoS NSW -->*

<dc:description>*TEXT(Outcome text)*</dc:description>

<dc:subject rdf:resource="*URI(learning area, out of http://vocabulary.curriculum.edu.au/AUScurriculumStrand)*"/>

<dc:rights>*TEXT(rights)*</dc:rights>

<dc:rightsHolder rdf:resource="http://www.boardofstudies.nsw.edu.au"/>

<dc:educationLevel rdf:resource="*URI(year level out of http://vocabulary.curriculum.edu.au/)*"/>

<gemq:isChildOf rdf:resource="*URI(Intermediate grouping 1)*"/>

...

<gemq:isChildOf rdf:resource="*URI(Intermediate grouping n)*"/>

*<!-- ordering is significant in JSON (Manifest) -->*

<asn:conceptTerm rdf:resource="*URI(ScOT keyword 1)*"/>

...

<asn:conceptTerm rdf:resource="*URI(ScOT keyword n)*"/>

<dc:spatial>*TEXT(Spatial Coverage 1)</*dc:spatial>

...

<dc:spatial rdf:resource="*URI(Spatial Coverage n)*"/>

<dc:temporal>*TEXT(Temporal Coverage 1)*</dc:temporal>

...

<dc:temporal rdf:resource="*URI(Temporal Coverage n)*"/>

</asn:Statement>

</rdf:RDF>

### Content Descriptions

A content description may be the child of multiple intermediate groupings. However in the curricula published to date, the machine readable curriculum has been so organised that it has only been the child of a single intermediate grouping.

Content descriptions belong to different levels, Level 1 through Level 4. Certain content descriptions are mere labels. Moreover, content descriptions can be classified as skills content descriptions and content content descriptions. The statement label “content description” is applied to all content descriptions. The distinction in levels is realised through RDF schema subclasses.

We define in the NSW Board of Studies namespace the following subclasses of ASN statements:

<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"> xmlns:asn="http://purl.org/ASN/schema/core/" xmlns:nswbos="http://www.boardofstudies.nsw.edu.au/rdf#">

<rdfs:Class rdf:about="http://www.boardofstudies.nsw.edu.au/rdf#content\_description\_level\_1">

<rdfs:subClassOf rdf:resource="http://purl.org/ASN/schema/core/Statement"/>

</rdfs:Class>

<rdfs:Class rdf:about="http://www.boardofstudies.nsw.edu.au/rdf#content\_description\_level\_2">

<rdfs:subClassOf rdf:resource="http://purl.org/ASN/schema/core/Statement"/>

</rdfs:Class>

<rdfs:Class rdf:about="http://www.boardofstudies.nsw.edu.au/rdf#content\_description\_level\_3">

<rdfs:subClassOf rdf:resource="http://purl.org/ASN/schema/core/Statement"/>

</rdfs:Class>

<rdfs:Class rdf:about="http://www.boardofstudies.nsw.edu.au/rdf#content\_description\_level\_4">

<rdfs:subClassOf rdf:resource="http://purl.org/ASN/schema/core/Statement"/>

</rdfs:Class>

<rdfs:Class rdf:about="http://www.boardofstudies.nsw.edu.au/rdf#skills\_content\_description">

<rdfs:subClassOf rdf:resource="http://purl.org/ASN/schema/core/Statement"/>

</rdfs:Class>

<rdfs:Class rdf:about="http://www.boardofstudies.nsw.edu.au/rdf#content\_content\_description">

<rdfs:subClassOf rdf:resource="http://purl.org/ASN/schema/core/Statement"/>

</rdfs:Class>

<rdfs:Class rdf:about="http://www.boardofstudies.nsw.edu.au/rdf#label\_content\_description">

<rdfs:subClassOf rdf:resource="http://purl.org/ASN/schema/core/Statement"/>

</rdfs:Class>

</rdf:RDF>

The ways of encoding temporal and spatial coverage are described below. Issues with general capabilities and cross-curriculum priorities are described below.

#### Content descriptions are divided into labels, ACARA content descriptions derived from Australian Curriculum content descriptions, and BoS NSW content descriptions formulated independently by the NSW Board of Studies.Label Content Descriptions

Label content descriptions have no associated tags or learning resources, and are not indexed. Labels do not have codes.

<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:gemq="http://purl.org/gem/qualifiers/" xmlns:asn="http://purl.org/ASN/schema/core/" xmlns:loc="http://www.loc.gov/loc.terms/relators/" xmlns:dcterms="http://purl.org/dc/terms/" xmlns:foaf="http://xmlns.com/foaf/0.1/" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">

<asn:Statement rdf:about="*URI(Content Description id)*">

<dcterms:isPartOf rdf:resource="*URI(Curriculum Document)*">

<asn:authorityStatus rdf:resource="http://purl.org/ASN/scheme/ASNAuthorityStatus/Original"/>

*<!—Authority Status “derived” is used by third parties -->*

<dc:modified>*DATE(Content Description changed)*</dc:modified>

<asn:indexingStatus rdf:resource="http://purl.org/ASN/scheme/ASNIndexingStatus/No" />

*<!-- Only index statements associated with resource discovery -->*

<asn:statementLabel xml:lang="en-AU">ContentDescription</asn:statementLabel>

<rdf:type rdf:resource="http://www.boardofstudies.nsw.edu.au/rdf#label\_content\_description"/>

<dc:description>*TEXT(Content Description text)*</dc:description>

<dc:subject rdf:resource="*URI(learning area, out of http://vocabulary.curriculum.edu.au/AUScurriculumStrand)*"/>

<dc:rights>*TEXT(rights)*</dc:rights>

<dc:rightsHolder rdf:resource="http://www.boardofstudies.nsw.edu.au"/>

<dc:educationLevel rdf:resource="*URI(year level out of http://vocabulary.curriculum.edu.au/)*"/>

<gemq:isChildOf rdf:resource="*URI(Intermediate grouping 1)*"/>

...

<gemq:isChildOf rdf:resource="*URI(Intermediate grouping n)*"/>

*<!-- ordering is significant in JSON (Manifest) -->*

<gemq:hasChild rdf:resource="*URI(Content Description 1)*"/>

...

<gemq:hasChild rdf:resource="*URI(Content Description n)*"/>

</asn:Statement>

</rdf:RDF>

#### BoS NSW Content Descriptions

BoS NSW content descriptions are provided independently of the Australian Curriculum. BoS NSW content descriptions do not have public codes of their own.

<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:gemq="http://purl.org/gem/qualifiers/" xmlns:asn="http://purl.org/ASN/schema/core/" xmlns:loc="http://www.loc.gov/loc.terms/relators/" xmlns:dcterms="http://purl.org/dc/terms/" xmlns:foaf="http://xmlns.com/foaf/0.1/" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">

<asn:Statement rdf:about="*URI(Content Description id)*">

<dcterms:isPartOf rdf:resource="*URI(Curriculum Document)*">

<asn:authorityStatus rdf:resource="http://purl.org/ASN/scheme/ASNAuthorityStatus/Original"/>

*<!—Authority Status “derived” is used by third parties -->*

<dc:modified>*DATE(Content Description changed)*</dc:modified>

<asn:indexingStatus rdf:resource=" *URI(Value of* http://purl.org/ASN/scheme/ASNIndexingStatus/*)*" />

*<!-- Only index statements associated with resource discovery -->*

<asn:statementLabel xml:lang="en-AU">ContentDescription</asn:statementLabel>

<rdf:type rdf:resource=" *URI(Type of Content Description)*"/>

<dc:description>*TEXT(Content Description text)*</dc:description>

<dc:subject rdf:resource="*URI(learning area, out of http://vocabulary.curriculum.edu.au/AUScurriculumStrand)*"/>

<dc:rights>*TEXT(rights)*</dc:rights>

<dc:rightsHolder rdf:resource="http://www.boardofstudies.nsw.edu.au"/>

<dc:educationLevel rdf:resource="*URI(first year level out of http://vocabulary.curriculum.edu.au/)*"/>

<dc:educationLevel rdf:resource="*URI(second year level out of http://vocabulary.curriculum.edu.au/)*"/>

<gemq:isChildOf rdf:resource="*URI(Intermediate grouping 1)*"/>

...

<gemq:isChildOf rdf:resource="*URI(Intermediate grouping n)*"/>

<gemq:isChildOf rdf:resource="*URI(Content Description 1)*"/>

...

<gemq:isChildOf rdf:resource="*URI(Content Description n)*"/>

*<!-- ordering is significant in JSON (Manifest) -->*

<gemq:hasChild rdf:resource="*URI(Content Description 1)*"/>

...

<gemq:hasChild rdf:resource="*URI(Content Description n)*"/>

<asn:skillEmbodied rdf:resource="*URI(General Capability 1)*"/>

...

<asn:skillEmbodied rdf:resource="*URI(General Capability n)*"/>

<dc:relation rdf:resource="*URI(Cross-Curriculum Priority 1)*"/>

...

<dc:relation rdf:resource="*URI(Cross-Curriculum Priority n)*"/>

<dc:relation rdf:resource="*URI(Other Learning Areas 1)*"/>

...

<dc:relation rdf:resource="*URI(Other Learning Areas n)*"/>

<asn:conceptTerm rdf:resource="*URI(ScOT keyword 1)*"/>

...

<asn:conceptTerm rdf:resource="*URI(ScOT keyword n)*"/>

<dc:spatial>*TEXT(Spatial Coverage 1)</*dc:spatial>

...

<dc:spatial rdf:resource="*URI(Spatial Coverage n)*"/>

<dc:temporal>*TEXT(Temporal Coverage 1)*</dc:temporal>

...

<dc:temporal rdf:resource="*URI(Temporal Coverage n)*"/>

</asn:Statement>

</rdf:RDF>

#### ACARA Content Descriptions

ACARA content descriptions are derived from their counterparts in the Australian Curriculum, and are explicitly marked up as derived in the Machine Readable BoS Syllabus. ACARA content descriptions do not have public codes of their own, distinct from the source Australian Curriculum content descriptions.

As best practice, the URI of the source Australian Curriculum content descriptions should be the version of the URI using the content description code, e.g. <http://rdf.australiancurriculum.edu.au/elements/ACMNA013>

<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:gemq="http://purl.org/gem/qualifiers/" xmlns:asn="http://purl.org/ASN/schema/core/" xmlns:loc="http://www.loc.gov/loc.terms/relators/" xmlns:dcterms="http://purl.org/dc/terms/" xmlns:foaf="http://xmlns.com/foaf/0.1/" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">

<asn:Statement rdf:about="*URI(Content Description id)*">

<dcterms:isPartOf rdf:resource="*URI(Curriculum Document)*">

<asn:authorityStatus rdf:resource="http://purl.org/ASN/scheme/ASNAuthorityStatus/Derived"/>

<asn:derivedFrom rdf:resource="*URI(Australian Curriculum Content Description)*"/>

<dc:modified>*DATE(Content Description changed)*</dc:modified>

<asn:indexingStatus rdf:resource=" *URI(Value of* http://purl.org/ASN/scheme/ASNIndexingStatus/*)*" />

*<!-- Only index statements associated with resource discovery -->*

<asn:statementLabel xml:lang="en-AU">ContentDescription</asn:statementLabel>

<rdf:type rdf:resource="*URI(Type of Content Description)*"/>

<dc:description>*TEXT(Content Description text)*</dc:description>

<dc:subject rdf:resource="*URI(learning area, out of http://vocabulary.curriculum.edu.au/AUScurriculumStrand)*"/>

<dc:rights>*TEXT(rights)*</dc:rights>

<dc:rightsHolder rdf:resource="http://www.boardofstudies.nsw.edu.au"/>

<dc:educationLevel rdf:resource="*URI(first year level out of http://vocabulary.curriculum.edu.au/)*"/>

<dc:educationLevel rdf:resource="*URI(second year level out of http://vocabulary.curriculum.edu.au/)*"/>

<gemq:isChildOf rdf:resource="*URI(Intermediate grouping 1)*"/>

...

<gemq:isChildOf rdf:resource="*URI(Intermediate grouping n)*"/>

<gemq:isChildOf rdf:resource="*URI(Content Description 1)*"/>

...

<gemq:isChildOf rdf:resource="*URI(Content Description n)*"/>

*<!-- ordering is significant in JSON (Manifest) -->*

<gemq:hasChild rdf:resource="*URI(Content Description 1)*"/>

...

<gemq:hasChild rdf:resource="*URI(Content Description n)*"/>

<asn:skillEmbodied rdf:resource="*URI(General Capability 1)*"/>

...

<asn:skillEmbodied rdf:resource="*URI(General Capability n)*"/>

<dc:relation rdf:resource="*URI(Cross-Curriculum Priority 1)*"/>

...

<dc:relation rdf:resource="*URI(Cross-Curriculum Priority n)*"/>

<dc:relation rdf:resource="*URI(Other Learning Areas 1)*"/>

...

<dc:relation rdf:resource="*URI(Other Learning Areas n)*"/>

<asn:conceptTerm rdf:resource="*URI(ScOT keyword 1)*"/>

...

<asn:conceptTerm rdf:resource="*URI(ScOT keyword n)*"/>

<dc:spatial>*TEXT(Spatial Coverage 1)</*dc:spatial>

...

<dc:spatial rdf:resource="*URI(Spatial Coverage n)*"/>

<dc:temporal>*TEXT(Temporal Coverage 1)*</dc:temporal>

...

<dc:temporal rdf:resource="*URI(Temporal Coverage n)*"/>

</asn:Statement>

</rdf:RDF>

### Achievement Standards

Outcomes are currently organised in the NSW Syllabus at the level of intermediate groupings, loosely aligned to the content descriptions within the intermediate grouping.

Stage statements are currently entered in the NSW Syllabus CMS as prefatory material and cannot be accessed for the RDF without changes being made to the CMS. As a result, they are not currently included in the machine readable syllabus as atomic curriculum statements.

## Manifest (RDF/JSON)

Manifest files, expressed in JSON, express a particular ordering of the nodes in the machine readable curriculum RDF: they replicate the RDF structure of the curriculum as a single JSON associative array. There can be multiple manifest files for a single curriculum document, expressing different hierarchical orderings of curriculum statements. The Machine Readable NSW Board of Studies Syllabus shall only support one hierarchical ordering..

As a general principle and on the advice of the Achievement Standards Network, the use of rdf:Seq and rdf:Bag in the machine readable RDF is deprecated, since these constructions complicate RDF queries, in favour of representing order through the manifest file.

* rdf:Bag is replaced by listing the relation separately for each object.
* rdf:Seq is replaced by listing the relation separately for each object, in conjunction with the separate manifest file.

The manifest is a JSON presentation of the RDF, as documented at [http://standards.jesandco.org/wiki/ASN\_Export\_Version\_Key/3.0.0#What\_can\_you\_do\_with\_a\_manifest\_file.3F](http://standards.jesandco.org/wiki/ASN_Export_Version_Key/3.0.0" \l "What_can_you_do_with_a_manifest_file.3F):

* rdf:about becomes the property "id"
* dcterms:description becomes the property "text"
* dcterms:isPartOf and gemq:isChildOf are omitted: the manifest is only intended for top-down navigation
* Human readable rdfs:label can be used (e.g. for education level), since the manifest is meant for human consumption; this is done using SKOS’ "prefLabel". So <asn:indexingStatus rdf:resource="http://purl.org/ASN/scheme/ASNIndexingStatus/No"/> is rendered as{"prefLabel":"Non-indexable Statement", "uri":"http://purl.org/ASN/scheme/ASNEducationLevel/No"}  
  The current file includes only a few human-readable labels; more may be added in future releases.
* The properties "cls":"folder" and "leaf":"true" are used to indicate whether the entity is a node (folder metaphor) or leaf.

# Differences from ASN Application Profile

The RDF of the Australian Curriculum has been aligned, so far as is practical, with version 3.1.0 of the ASN Application Profile and version 3.0 of the Machine Readable Australian Curriculum. The following divergences from ASN-AP (which are common to the Machine Readable Australian Curriculum) can be noted:

## Dublin Core

ASN-AP already uses Dublin Core terms to enhance its ontology. The following Dublin Core terms are used in the Australian Curriculum and the Board of Studies Syllabus in addition to those used in ASN-AP:

* dc:modified has been added to documents and statements, to indicate when the curriculum (not the RDF) was last updated.
* dc:title has been added to statements, to give names for statement groupings. (Currently used only for stages)
* dc:relation has been added to content descriptions, to link them to cross-curriculum priorities and other learning areas. The cross-curriculum priorities and other learning areas can be identified as such through their controlled vocabulary.

## dcterms:valid

[Version 3.0.0](http://standards.jesandco.org/wiki/ASN_Export_Version_Key/3.0.0) of the ASN-AP switched from using dcterms:created for a third party statement (when the curriculum document was authored) to dcterms:valid (when does the curriculum statement take effect), and gives the datatype of the date explicitly.

The Australian Curriculum does not use either dcterms:created or dcterms:valid; the relationship is only meant to be used "for *non-canonical* statements created by a third party", so it will not be used within the Australian Curriculum or Board of Studies Syllabus RDF.

In the documentation of the profile online, ASN go on to make dcterms:valid mandatory: Joseph Chapman of ASN has confirmed that this is in error, and the date is not intended to apply to original statements as well as third party statements.

# Vocabularies

The following vocabularies and namespaces are used in the ASN Application Profile, and their use is maintained in the NSW Board of Studies Syllabus RDF:

* ASN (Achievement Standards Network) Terms [asn, <http://purl.org/ASN/schema/core/>] (Curriculum properties)
* Dublin Core [dc, <http://purl.org/dc/elements/1.1/>] (Generic Dublin core metadata)
* DCMI Metadata Terms [dct, <http://purl.org/dc/terms/>] (Generic Dublin core metadata)
* GEM Qualified Terms [gemq, <http://purl.org/gem/qualifiers/>] (Learning resource discovery, aligned with ASN)
* FOAF (Friend of a Friend) [foaf, <http://xmlns.com/foaf/0.1/>] (Generic coding of people)
* SKOS (Simple Knowledge Organization System) [skos, <http://www.w3.org/2004/02/skos/>] (Semantic web thesaurus infrastructure)
* Creative Commons [cc, http://creativecommons.org/ns#] (Creative Commons licensing)

The Australian Curriculum RDF further uses the namespaces managed by ESA on behalf of ACARA through Australian Education Vocabularies, <http://vocabulary.curriculum.edu.au/> , and intended to support RDF encoding of the National Curriculum:

* SCOT: <http://vocabulary.curriculum.edu.au/scot/>
* Australian Curriculum Strand: <http://vocabulary.curriculum.edu.au/AUScurriculumStrand/>
* Australian cross-curriculum perspective : <http://vocabulary.curriculum.edu.au/AUScrossCurriculumPerspective/>
* Other learning across the curriculum areas (NSW-specific)
* NSW Strands
* Australian general capability : <http://vocabulary.curriculum.edu.au/AUSgeneralCapability/>
* Australian learning resource type : <http://vocabulary.curriculum.edu.au/AUSlearningResourcetype/>
* Australian school level : <http://vocabulary.curriculum.edu.au/schoolLevel/>

# General Capabilities, Cross-Curriculum Priorities, Other Learning across the Curriculum Areas

cCapabilities, priorities and learning areas are described in prefatory material in the NSW Board of Studies Syllabus for each learning area. It is also important that these alignments be machine readable, which for an RDF model means that capabilities and priorities need to be given a URI, so that they can be referenced from curriculum statements. Capabilities and priorities should preferably themselves be described in RDF. However capabilities and priorities need to be encoded differently from curriculum statements: they are not covered by the ASN-AP.

The capabilities and priorities can be treated as vocabulary terms. As future versions of the curriculum may decompose them into more granular capabilities and priorities, it is appropriate to encode them as thesaurus terms, in RDF SKOS, unless there are explicit metadata requirements that would not be met by SKOS.

To date the Australian Curriculum capabilities and priorities have been encoded as SKOS through the Education Vocabularies Australia site:

* Australian cross-curriculum perspective : <http://vocabulary.curriculum.edu.au/AUScrossCurriculumPerspective/>
* Australian general capability : <http://vocabulary.curriculum.edu.au/AUSgeneralCapability/>

The Other Learning across the Curriculum Areas, which are specific to NSW, can be encoded in the same way.

# Spatial & Temporal Coverage

It is highly desirable for resource discovery that the spatial and temporal coverage of content descriptions, and possibly outcomes as well, be constrained. This will improve the precision of resource discovery in history in particular, by excluding resources covering unrelated places and times. If the NSW Board of Studies proceeds with encoding spatial and temporal coverage in the machine readable syllabus, they should align to the conventions given here, which have already been implemented for the Machine Readable Australian Curriculum.

## Temporal Coverage

Temporal coverage shall be expressed as DCMI Period (<http://dublincore.org/documents/dcmi-period/>) for time periods, and as W3CDTF (http://www.w3.org/TR/NOTE-datetime) for time instants. This aligns to existing practice e.g. in ANZ-LOM. Temporal coverage should be encoded according to the following templates, illustrating year and day precision:

<asn:statement rdf:about="http://example.com/123">

<dc:temporal rdf:datatype="http://purl.org/dc/terms/W3CDTF">

1917

</dc:temporal>

</asn:statement>

<asn:statement rdf:about="http://example.com/123">

<dc:temporal rdf:datatype="http://purl.org/dc/terms/W3CDTF">

1917-11-07

</dc:temporal>

</asn:statement>

<asn:statement rdf:about="http://example.com/456">

<dc:temporal rdf:datatype="http://dublincore.org/documents/dcmi-period/">

start=1914; end=1918;

</dc:temporal>

</asn:statement>

<asn:statement rdf:about="http://example.com/456">

<dc:temporal rdf:datatype="http://dublincore.org/documents/dcmi-period/">

start=1914-07-28; end=1918-11-11;

</dc:temporal>

</asn:statement>

## Spatial Coverage

Where available, a controlled vocabulary for locales mentioned in spatial coverage shall be used rather than a latitude and longitude. Latitude and longitude are attributes of locales, and shall be looked up outside the machine readable curriculum, in a gazetteer.

The preferred vocabulary for spatial coverage shall be GeoNames (<http://www.geonames.org/ontology/documentation.html>). Note that the Australian Curriculum uses the semantically opaque Semantic Web identifiers of GeoNames, rather than the human-readable web browser links; e.g. <http://sws.geonames.org/2145234> rather than <http://www.geonames.org/2145234/state-of-victoria.html> (= <http://www.geonames.org/2145234> ). Metadata about locales can be retrieved from the associated GeoNames RDF (<http://sws.geonames.org/2145234/about.rdf>), including longitudes and latitudes.

To facilitate search, human readable keywords for locations should be attached to the curriculum statement alongside the unambiguous opaque identifier, using the asn:conceptKeyword relation for freeform keywords. Keywords are also appropriate because of the difficulties in identifying spatial coverage for historical regions—whose extent and names may vary in time, and whose modern names may not be useful for discovery (e.g. Ancient vs Modern Greece; Augustus’ Roman Empire vs Trajan’s Roman Empire vs the modern city of Rome; Norway vs “the Vikings”; Edo vs Tokyo).

Encoding spatial location should therefore be encoded according to the following template:

<asn:statement rdf:about="http://example.com/123">

<dc:spatial rdf:resoruce="http://sws.geonames.org/3169070/"/>

<asn:conceptKeyword>Rome</asn:conceptKeyword>

<!-- http://sws.geonames.org/3169070/ is Rome, Italy, and not e.g. Rome, Indiana -->

</asn:statement>

Direct coding of latitude and longitude as spatial coverage should only be done as a last resort, if no well-defined locale is available in a controlled vocabulary. The geo ontology ([http://www.w3.org/2003/01/geo/wgs84\_pos#](http://www.w3.org/2003/01/geo/wgs84_pos)) shall be used to encode geographic points, according to the following template:

<asn:statement rdf:about="http://example.com/456">

<dc:spatial>

<geo:Point>

<geo:lat>55.701</geo:lat>

<geo:long>12.552</geo:long>

</geo:Point>

</dc:spatial>

</asn:statement>

The geo ontology does not extend to regions; DCMI Box (<http://dublincore.org/documents/dcmi-box>) can be used to encode regions.

## Inheritance

By default, if a curriculum statement has a given temporal or spatial coverage, any children of the statement also have that coverage. Examples:

* If a Strand is about the First World War, then any content descriptions or elaborations within the Strand should also be about the First World War, and have a temporal coverage within 1914–1918.
* If a Strand is about British Isles, any content description should also be about the British Isles.

However, coverage inheritance can be overruled by explicit coverage declarations in child statements:

* The child statement has narrower coverage (just 1915; just Ireland)
* The child statement has expanded coverage, though it is thematically related to the parent statement (1919 for Treaty of Versailles in the aftermath of World War I; British trading relations with China).

# Textual Content

Each curriculum has an internal structure of its textual preface, which may differ from instance to instance. The aim of the machine readable curriculum is to isolate and describe separately entities which will be experienced and described separately. The entities of primary interest in the curriculum are curriculum statements, and their organisation.

As a result, the expository text included in the prefatory material of the curriculum (rationale, aims, organisation, glossary) is not included in the machine-readable curriculum as literal text, but is referenced out to the Board of Studies Syllabus website.

The text of curriculum statements, including content descriptions, strands, stages and intermediate groupings, is all included in the machine readable curriculum. This simplifies the workflow for consumers of the curriculum such as jurisdictions and application developers, who may need to interact with the text of the curriculum structure offline.

# Versioning

There is currently no provision for aligning different versions of the Board of Studies Syllabus to each other. The RDF of the Syllabus made available is always the latest version approved by the NSW Board of Studies.

The information about the version of the curriculum encoded is limited to the information encoded in the ASN Application Profile:

* dc:modified, for the date that the RDF document was last updated
* dc:valid for the date that the Curriculum document is valid for (can be a range)

A version number may be incorporated in the RDF URI at a future date.

# Sample definition of property

If new properties/relations are defined for the NSW Board of Studies Syllabus, some of the characteristics of those properties should be defined, to allow for reasoning. This modelling should be done in coordination with ASN, and is strongly recommended for the published curriculum. The following is an example with discussion of how textrequirements might be defined, as a listing of bibliographic citations.

<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#" xmlns:bibo="http://purl.org/ontology/bibo/" xmlns:nswbos="http://vocabulary.curriculum.edu.au/nswbos/" >

<rdf:Property rdf:about="http://vocabulary.curriculum.edu.au/nswbos/textrequirements">

<rdfs:subPropertyOf rdf:resource="http://purl.org/dc/elements/1.1/Description" />

*<!-- for consistency with ASN-AP -->*

<rdfs:range rdf:resource="http://purl.org/ontology/bibo/book" />

*<!-- the value of textrequirements is a URL which is an instance of the bibo:Book class. This could easily be generalised to bibo:Document or some other RDF class, given for example the use of movies in curricula. More elaborate statements, e.g. Books + Movies, would require an OWL ontology -->*

<rdfs:domain rdf:resource="http://purl.org/ASN/schema/core/Statement" />

*<!-- only curriculum statements (e.g. courses and units) have textrequirements. This can be refined further, but not the way the ASN-AP is coded: the types of curriculum statement would have to be typed with explicit RDF classes, which takes away flexibility -->*

</rdf:Property>

</rdf:RDF>

Any further refinement of the property needs OWL.

The above-defined property would look like this:

<asn:Statement rdf:about="*URI(Curriculum Statement)*">

<nswbos:textrequirements rdf:resource="*URI(Text 1)*"/>

...

<nswbos:textrequirements rdf:resource="*URI(Text n)*"/>

</asn:Statement>

<bibo:Book rdf:about="*URI(Text 1)*">

...

</bibo:Book>

The following would be rejected as inconsistent with the definition:

<asn:Document rdf:about="*URI(English Curriculum)*">

<nswbos:textrequirements rdf:resource="*URI(Text 1)*"/>

*<!—Curriculum documents don't have text requirements, curriculum statements do -->*

</asn:Document>

<asn:Statement rdf:about="*URI(Curriculum Statement)*">

<nswbos:textrequirements rdf:resource="*URI(Text 2)*"/>

</asn:Statement>

<bibo:Article rdf:about="*URI(Text 2)*">

...

</bibo:Article>

*<!-- Articles are not text requirements, only books are -->*