

SIF NZ DATA MODEL – ASSESSMENT & ATTAINMENT – v1.1

A primary goal for SIF New Zealand is to build a New Zealand flavour of SIF Data Model that is largely based on the SIF Australia data model. The structures describing Student assessment and attainment have been developed jointly with the SIF AU data model.

The joint design process has highlighted the need for some deviation from the SIF AU data model for the SIF NZ data model:

- Renaming of the GradingAssignment and GradingAssignmentScore data objects to AssessmentTask and AssessmentTaskResult; recording the details of an individual assessment task, (be it a grading assignment, course exam, or an end of year course or programme final grade).
- Addition of AssessmentRegistration data object, recording a student's registration for assessments that are to be conducted by external agencies at some future date; (e.g. NZQA Learning Standard entries, Cambridge exam entries).
- Addition of StudentAssessment data object recording a Student's participation in a particular assessment task, including the applicability of special assessment conditions.
- Addition of StudentAttainment data object recording a Student's attainment of a qualification, credential, achieving a course or learning standard pass, based upon having achieved the requisite assessment results. (e.g. Achieving NCEA Level 1, by gaining sufficient learning standard credits).

1 Conceptual Data Model

Data requirements in the Assessment & Achievement domain differ between the Primary and Senior Secondary school sectors. Throughout this document we refer to Primary school assessment even though the data requirements are applicable to students from Year 1 through to junior secondary school (Years 9 & 10). Assessments are all conducted by the schools, with minimal involvement by any external agency.

Senior Secondary (Years 11, 12 & 13) assessments are conducted by external agencies, primarily New Zealand Qualifications Authority (NZQA); with substantial numbers of students also being assessed by Cambridge International Education (CIE) and International Baccalaureate (IB).

1.1 Assessment Design

| Entity | Description |
|-------------------|--|
| Assessment Family | A set of assessments with a common name, jurisdiction or focus. Primary examples: <i>PAT, STAR, IKAN & asTTle</i> Secondary examples: <i>NCEA, Cambridge Mathematics</i> |
| Assessment Task | An assessment instrument designed to provide an evaluation specific to a certain objective, education level and/or learning area according to the intent of its Assessment Family. The Assessment may be provided by use of an Assessment Form or by some other means (eg teacher judgement). |
| Assessment Form | An instance of an Assessment that can equate scores with another instance of that same Assessment. Primary example: <i>PAT Mathematics - Test 1a.</i> Secondary example: <i>Cambridge Maths - June 2017 Paper 1</i> |
| Component | Part of a programme or training scheme. Components together make up a coherent arrangement of learning or training. Components include projects, papers, courses, modules, practicum and skill and assessment standards. Secondary example: <i>12CHE Chemistry (Wellington College NCEA Level 2)</i> |
| Learning Standard | A specific competency or learning objective that forms part of a programme of learning. Secondary example: <i>91165 v2 Demonstrate understanding of organic compounds.</i> |

1.2 Assessment Results

| Entity | Description |
|--------------------|---|
| Student Assessment | <p>An instance of a student participation in an assessment including the student's results from that assessment.</p> <p>Primary example: <i>Jade has an assessment for STAR Years 3-4A.</i></p> <p>Secondary example: <i>Bill's subject choice of Chemistry requires that he will be assessed for 91162 v2 Demonstrate understanding of organic compounds.</i></p> |
| Result Score | <p>The value and metric that describes the score received for an Assessment Result.</p> <p>Primary example: <i>one of the scores achieved by Roger for his PAT Reading Comprehension – Test 5 was Stanine 6 (score value = '6', metric = 'Stanine').</i></p> <p>Secondary example: <i>Bill has been assessed as "Achieved with merit" for 91162 v2 Demonstrate understanding of organic compounds</i></p> |

1.3 Achievements

| Entity | Description |
|--------------------|---|
| Achievement Result | <p>The result achieved by a Student in respect of a qualification, award or other achievement.</p> <p>Secondary example: <i>a Student is recognised as having achieved</i></p> <ul style="list-style-type: none"> - <i>NCEA Level 3 Achieved with Excellence</i> - <i>Course Endorsement for Biology Endorsed with merit at Level 3.</i> |

1.4 Primary School Sector Assessment Conceptual Data Model

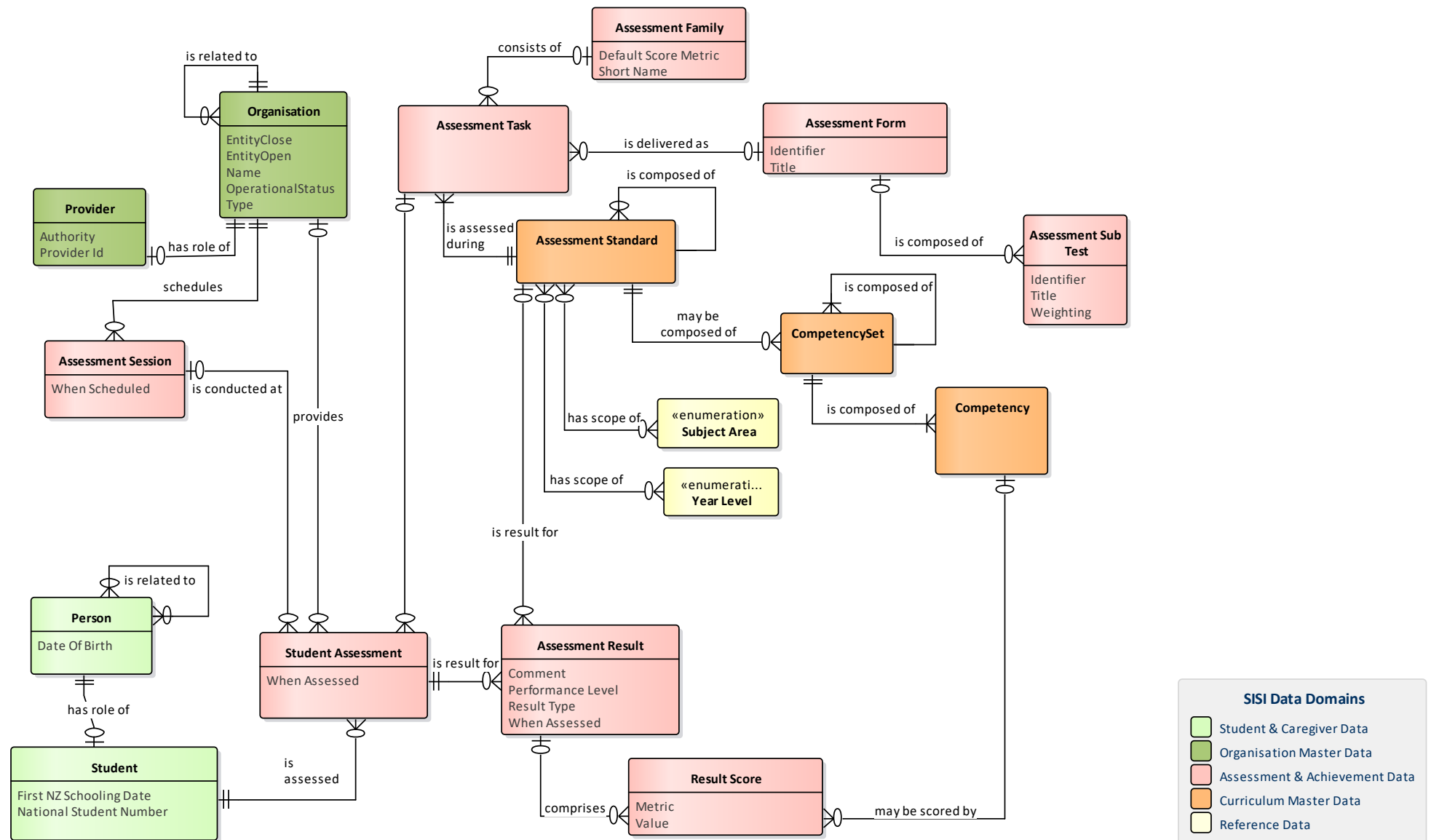


Figure 1: Primary School Sector Assessment - Conceptual Model

1.6 Secondary Sector Assessment – Entry and Results Conceptual Data Model

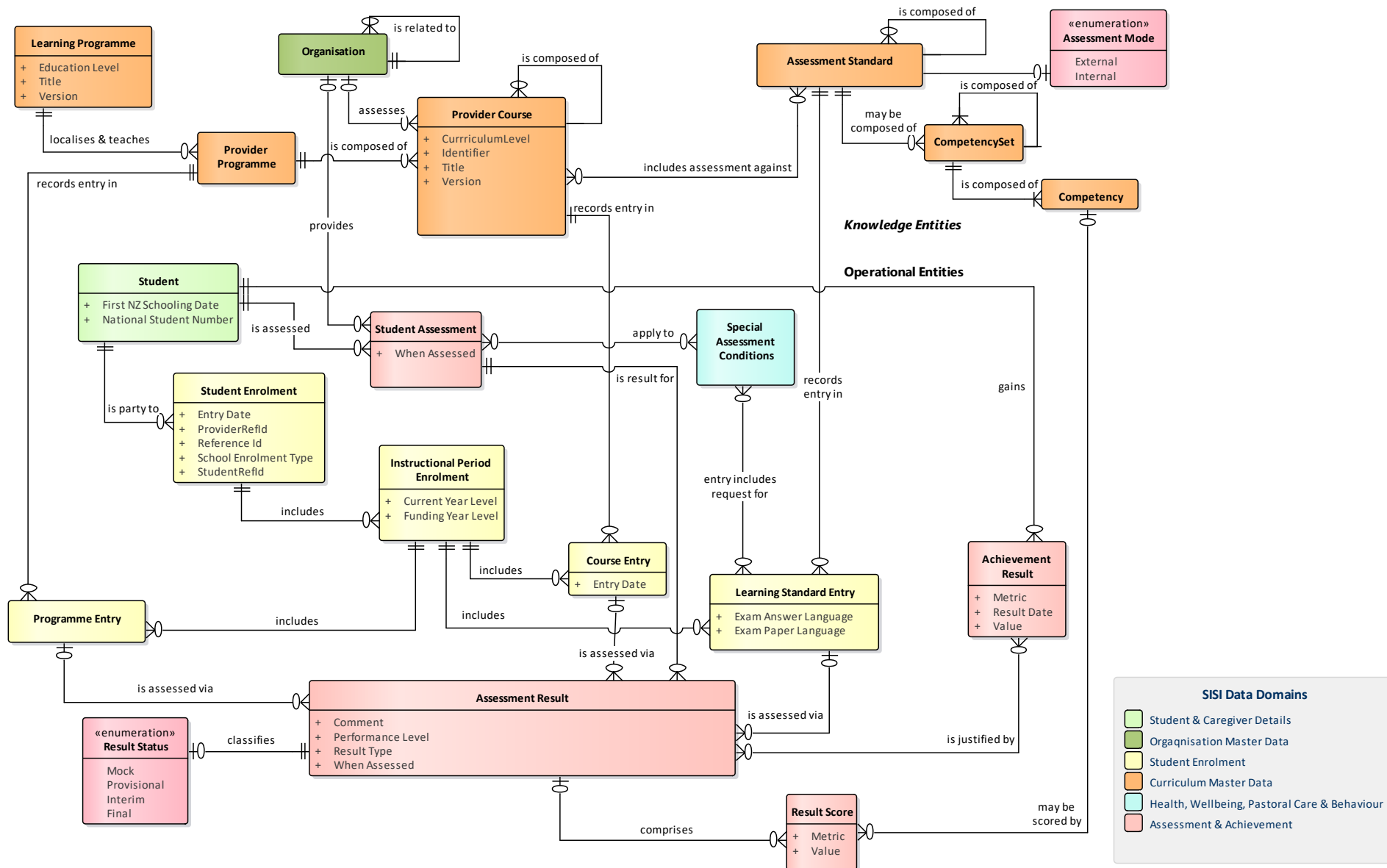


Figure 3: Secondary Sector Assessment – Entry and Results – Conceptual Model

2 Assessment & Achievement Data Requirements

2.1 Primary Sector Data Requirements

Primary schools do not typically have the concept of courses or subject choices. Instead assessment results are recorded in relation to assessment tools or judgement schemes according to learning areas and performance levels.

Primary schools choose from a variety of Assessment Tools which provide formal, standardised tests. The results from these tests are expressed in defined metrics that allow students to be readily compared across classes or schools.

Primary schools also conduct less formal, subjective assessments (or judgements) based on evidence for various sources, including formal tests. Results for these may be expressed using a mixture of defined metrics and teacher statements. These results indicate achievement in relation to the relevant half of *The National Curriculum* (either The New Zealand Curriculum or Te Marautanga o Aotearoa).

Achievements and awards may apply to Primary sector but are not yet included in the scope under review.

The following Assessment Tools are a sample of those used by Primary schools in assessing student's learning and progress. This sample is intended to give an indication of the range of complexity of the major assessment tools.

The data requirements are intended to propose a generic approach to structuring this data that will apply to any Primary school assessment tool.

2.1.1 PAT Progressive Achievement Tests

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------|---|---|--------|---------------------------|-------|--------------------------|-------|--------------------------|-------|--------------------------|-------|--------------------------|-------|--------------------------|--------|---------------------------|-------|--------------------------|-------|--------------------------|-------|------------------------------------|-------|------------------------------------|-------|------------------------------------|-------|------------------------------------|-------|------------------------------------|-------|------------------------------------|-------|------------------------------------|--------|---------------------------------|--------|---------------------------------|--------|---------------------------------|--------|---------------------------------|--------|---------------------------------|--------|---------------------------------|--------|---------------------------------|
| Assessment Family | PAT - Progressive Achievement Tests | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Learning Area | Mathematics Listening comprehension Reading comprehension Reading vocabulary <i>Punctuation and grammar - not yet included</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Assessment Forms | <table><tr><td>Math1a</td><td>PAT Mathematics - Test 1a</td></tr><tr><td>Math1</td><td>PAT Mathematics - Test 1</td></tr><tr><td>Math2</td><td>PAT Mathematics - Test 2</td></tr><tr><td>Math3</td><td>PAT Mathematics - Test 3</td></tr><tr><td>Math4</td><td>PAT Mathematics - Test 4</td></tr><tr><td>Math5</td><td>PAT Mathematics - Test 5</td></tr><tr><td>Math6a</td><td>PAT Mathematics - Test 6a</td></tr><tr><td>Math6</td><td>PAT Mathematics - Test 6</td></tr><tr><td>Math7</td><td>PAT Mathematics - Test 7</td></tr><tr><td>Comp1</td><td>PAT Reading Comprehension - Test 1</td></tr><tr><td>Comp2</td><td>PAT Reading Comprehension - Test 2</td></tr><tr><td>Comp3</td><td>PAT Reading Comprehension - Test 3</td></tr><tr><td>Comp4</td><td>PAT Reading Comprehension - Test 4</td></tr><tr><td>Comp5</td><td>PAT Reading Comprehension - Test 5</td></tr><tr><td>Comp6</td><td>PAT Reading Comprehension - Test 6</td></tr><tr><td>Comp7</td><td>PAT Reading Comprehension - Test 7</td></tr><tr><td>Vocab1</td><td>PAT Reading Vocabulary - Test 1</td></tr><tr><td>Vocab2</td><td>PAT Reading Vocabulary - Test 2</td></tr><tr><td>Vocab3</td><td>PAT Reading Vocabulary - Test 3</td></tr><tr><td>Vocab4</td><td>PAT Reading Vocabulary - Test 4</td></tr><tr><td>Vocab5</td><td>PAT Reading Vocabulary - Test 5</td></tr><tr><td>Vocab6</td><td>PAT Reading Vocabulary - Test 6</td></tr><tr><td>Vocab7</td><td>PAT Reading Vocabulary - Test 7</td></tr></table> | | Math1a | PAT Mathematics - Test 1a | Math1 | PAT Mathematics - Test 1 | Math2 | PAT Mathematics - Test 2 | Math3 | PAT Mathematics - Test 3 | Math4 | PAT Mathematics - Test 4 | Math5 | PAT Mathematics - Test 5 | Math6a | PAT Mathematics - Test 6a | Math6 | PAT Mathematics - Test 6 | Math7 | PAT Mathematics - Test 7 | Comp1 | PAT Reading Comprehension - Test 1 | Comp2 | PAT Reading Comprehension - Test 2 | Comp3 | PAT Reading Comprehension - Test 3 | Comp4 | PAT Reading Comprehension - Test 4 | Comp5 | PAT Reading Comprehension - Test 5 | Comp6 | PAT Reading Comprehension - Test 6 | Comp7 | PAT Reading Comprehension - Test 7 | Vocab1 | PAT Reading Vocabulary - Test 1 | Vocab2 | PAT Reading Vocabulary - Test 2 | Vocab3 | PAT Reading Vocabulary - Test 3 | Vocab4 | PAT Reading Vocabulary - Test 4 | Vocab5 | PAT Reading Vocabulary - Test 5 | Vocab6 | PAT Reading Vocabulary - Test 6 | Vocab7 | PAT Reading Vocabulary - Test 7 |
| Math1a | PAT Mathematics - Test 1a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Math1 | PAT Mathematics - Test 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Math2 | PAT Mathematics - Test 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Math3 | PAT Mathematics - Test 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Math4 | PAT Mathematics - Test 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Math5 | PAT Mathematics - Test 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Math6a | PAT Mathematics - Test 6a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Math6 | PAT Mathematics - Test 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Math7 | PAT Mathematics - Test 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Comp1 | PAT Reading Comprehension - Test 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Comp2 | PAT Reading Comprehension - Test 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Comp3 | PAT Reading Comprehension - Test 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Comp4 | PAT Reading Comprehension - Test 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Comp5 | PAT Reading Comprehension - Test 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Comp6 | PAT Reading Comprehension - Test 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Comp7 | PAT Reading Comprehension - Test 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vocab1 | PAT Reading Vocabulary - Test 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vocab2 | PAT Reading Vocabulary - Test 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vocab3 | PAT Reading Vocabulary - Test 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vocab4 | PAT Reading Vocabulary - Test 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vocab5 | PAT Reading Vocabulary - Test 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vocab6 | PAT Reading Vocabulary - Test 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vocab7 | PAT Reading Vocabulary - Test 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Score Metrics | Raw Score | The raw (unscaled) score achieved Used as an input for determining other metrics but not itself of much use for understanding result. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Scale Score | The conversion of a raw test score to a location on a described equal-interval scale designed to measure progress over several year levels. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Margin of Error | The margin of error statistically calculated for the given scale score. Expressed as a margin plus or minus of the scale score. Example: for PAT Mathematics - Test 2, a student with a raw score of 16 would have a corresponding scale score of 37.6. The error margin for this score is 3.5, so the student’s real score is likely to fall between 34.1 and 41.1 (37.6 plus and minus 3.5). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | |
|--------------------------|---|---|
| | Stanine | <p>A graded value derived from the raw score and year level. Used to compare an individual student's achievement with the results obtained by a national reference sample chosen to represent a certain year level.</p> <p>Likely to be the most useful metric to inform a new school when a student transfers.</p> |
| Performance Level | <p>The reference year is the year level of the national reference group, with which the students result is compared against.</p> <p>This may be the same year level as the student's current year or it may be current year level plus or minus 1.</p> <p>This means for example that if a student has an 'instructional year' of year 6 and chooses to look at their results compared with the national levels of year 7 students (the 'reference year') then the students' achievement on each item is being compared with the achievements of a national reference group of the next year level.</p> | |

| <div> <div> <div>MATHEMATICS TEST</div> <div>1A</div> </div> </div> | | | | | |
|---|-----------------------|-----------------|----------------|----------------|----------------|
| Score Conversion Table: Test 1A | | | | | |
| Test score (number correct) | Scale score (patm) | Error (patm) | Year 3 stanine | Year 4 stanine | Year 5 stanine |
| 30 | 66.9 | >10.2 | 9 | 9 | 9 |
| 29 | 56.6 | 10.2 | 9 | 9 | 8 |
| 28 | 49.2 | 7.4 | 9 | 8 | 7 |
| 27 | 44.6 | 6.2 | 9 | 7 | 6 |
| 26 | 41.2 | 5.5 | 8 | 7 | 5 |
| 25 | 38.5 | 5.0 | 8 | 6 | 5 |
| 24 | 36.1 | 4.7 | 7 | 6 | 5 |
| 23 | 34.0 | 4.5 | 7 | 6 | 4 |
| 22 | 32.1 | 4.3 | 7 | 5 | 4 |
| 21 | 30.3 | 4.2 | 6 | 5 | 4 |
| 20 | 28.6 | 4.1 | 6 | 5 | 3 |
| 19 | 26.9 | 4.0 | 6 | 4 | 3 |
| 18 | 25.3 | 4.0 | 6 | 4 | 3 |
| 17 | 23.8 | 3.9 | 5 | 4 | 3 |
| 16 | 22.3 | 3.9 | 5 | 4 | 2 |
| 15 | 20.7 | 3.9 | 5 | 3 | 2 |
| 14 | 19.2 | 3.9 | 5 | 3 | 2 |
| 13 | 17.6 | 4.0 | 4 | 3 | 2 |
| 12 | 16.0 | 4.0 | 4 | 3 | 1 |
| 11 | 14.4 | 4.1 | 4 | 2 | 1 |
| 10 | 12.7 | 4.2 | 4 | 2 | 1 |
| 9 | 10.9 | 4.3 | 3 | 2 | 1 |
| 8 | 8.9 | 4.5 | 3 | 2 | 1 |
| 7 | 6.9 | 4.7 | 3 | 1 | 1 |
| 6 | 4.6 | 4.9 | 2 | 1 | 1 |
| 5 | 2.0 | 5.3 | 2 | 1 | 1 |
| 4 | -1.0 | 5.7 | 1 | 1 | 1 |
| 3 | -4.7 | 6.4 | 1 | 1 | 1 |

2.1.1.1 Assessment Example - PATs

Two students are enrolled at Hogwarts School in year 5 for the 2016 academic year. The students participate in a PAT assessment for Mathematics, taking the Math1a test on 10th Oct 2016. Both students score the same raw score.

The school determines the assessment results – scale score and stanine - at the year 5 level for one student and year 4 level for the other.

| | Student 1 | Student 2 |
|------------------|-----------|-----------|
| Raw Score: | 25 | 25 |
| Scale Score: | 38.5 | 38.5 |
| Margin of Error: | 5.0 | 5.0 |
| Stanine: | 6 | 5 |
| Year Level: | 4 | 5 |

2.1.1.2 Sample Data Elements – PAT Assessment Result

| | | | |
|------------------------|---------------------|-------------|-------------------------------|
| Assessment Task | Assessment Family | Code | PAT |
| | | Description | Progressive Achievement Tests |
| | Learning Area | | Mathematics |
| | Learning Standard | RefId | <Not Applicable> |
| | | Code | |
| | | Title | |
| | | Authority | |
| | Assessment Form | RefId | AF456789 |
| | | Code | Math1a |
| | | Title | PAT Mathematics - Test 1a |
| | Session Date | | 20 March 2017 |
| | Assessment Provider | Code | 247 |

| | | | |
|---------------------------|-------------------|--|---------------|
| Student Assessment | Performance Level | | 4 |
| | Assessment Date | | |
| | Result Date | | 27 March 2017 |

| | | | |
|---------------------|------------|-------|------------------|
| Result Score | Metric | | Raw Score |
| | Value | | 25 |
| | Competency | RefId | <Not Applicable> |
| Result Score | Metric | | Scale Score |
| | Value | | 38.5 |
| | Competency | RefId | <Not Applicable> |
| Result Score | Metric | | Stanine |
| | Value | | 6 |
| | Competency | RefId | <Not Applicable> |
| Result Score | Metric | | Margin of Error |
| | Value | | 5.0 |
| | Competency | RefId | <Not Applicable> |

2.1.2 STAR - Supplementary test of achievement in reading

| | | |
|--------------------------|---|--|
| Assessment Family | STAR - Supplementary test of achievement in reading | |
| Learning Area | Reading | |
| Assessment Forms | Years 3-4 A Years 3-4 B Years 3-4 C Years 5-6 A Years 5-6 B Years 5-6 C Years 7-8 A Years 7-8 B Years 7-8 C Year 9A | |
| Score Metrics | Raw Score | The raw (unscaled) score achieved for a sub test |
| | Scale Score | The conversion of a raw test score to a location on a described equal-interval scale designed to measure progress over several year levels. |
| | Stanine | A graded value derived from the raw score and year level. Used to compare an individual student's achievement with the results obtained by a national reference sample chosen to represent a certain year level. |
| Performance Level | <p>The reference year is the year level of the national reference group, with which the students result is compared against.</p> <p>This may be the same year level as the student's current year or it may be current year level plus or minus 1.</p> <p>This means for example that if a student has an 'instructional year' of year 6 and chooses to look at their results compared with the national levels of year 7 students (the 'reference year') then the students' achievement on each item is being compared with the achievements of a national reference group of the next year level.</p> | |
| Assessment Result | <p>Each sub test has a raw score result.</p> <p>The overall result for the Assessment Form is expressed as a scale score and stanine and is determined from sub test raw score results.</p> <p>The assessment result includes an assessment summary comment and next learning steps comment.</p> | |

2.1.2.1 Assessment Example – STAR

A student is enrolled at Hogwarts School in year 5 for the 2016 academic year; they participate in a STAR assessment for Reading. The student takes the Year5-6B test on 10th June 2016.

The school determines the student's results at the year 5 level.

| Test | Raw Score | Scale Score | Stanine | Year Level |
|----------------|-----------|-------------|---------|------------|
| Sub Test 1 | 8 | | | |
| Sub Test 2 | 7 | | | |
| Sub Test 3 | 10 | | | |
| Sub Test 4 | 9 | | | |
| Summary Result | | 22 | 4 | 5 |

The teacher also provides the following comments:

- **Assessment Summary:** Good progress this year...
- **Next Learning Steps:** Read more at home...

2.1.2.2 Sample Data Elements – STAR Assessment Result

| | | | |
|-----------------|---------------------|-------------|--|
| Assessment Task | Assessment Family | Code | STAR |
| | | Description | Supplementary test of achievement in reading |
| | Learning Area | | Reading |
| | Learning Standard | RefId | <Not Applicable> |
| | | Code | |
| | | Title | |
| | | Authority | |
| | Assessment Form | RefId | AF456123 |
| | | Code | 5-6 B |
| | | Title | STAR Reading – Years 5-6B |
| | Session Date | | 10 June 2016 |
| | Assessment Provider | Code | 247 |

| | | |
|--------------------|-------------------|--------------|
| Student Assessment | Performance Level | 5 |
| | Assessment Date | 10 June 2016 |
| | Result Date | 12 June 2016 |

| | | | |
|--------------|------------|-------------|-----------------------------|
| Result Score | Metric | | Comment |
| | Value | | Good progress this year ... |
| | Competency | RefId | |
| | | Description | Assessment Summary |
| Result Score | Metric | | Comment |
| | Value | | Read more at home |
| | Competency | RefId | |
| | | Description | Next Learning Steps |
| Result Score | Metric | | Raw Score |
| | Value | | 8 |
| | Competency | RefId | |
| | | Description | SubTest 1 |
| Result Score | Metric | | Raw Score |
| | Value | | 7 |
| | Competency | RefId | |
| | | Description | SubTest 2 |
| Result Score | Metric | | Raw Score |
| | Value | | 10 |
| | Competency | RefId | |
| | | Description | SubTest 3 |
| Result Score | Metric | | Raw Score |
| | Value | | 9 |
| | Competency | RefId | |
| | | Description | SubTest 4 |
| Result Score | Metric | | Scale Score |
| | Value | | 22 |
| | Competency | RefId | |
| | | Description | Summary |
| Result Score | Metric | | Stanine |
| | Value | | 4 |
| | Competency | RefId | |
| | | Description | Summary |

2.1.3 asTTle – Assessment Tools for Teaching and Learning

e-asTTle is one of New Zealand's most commonly used online assessment tools, developed to assess students' achievement and progress in reading, mathematics, writing, and in pānui, pāngarau and tuhituhi. The tool has been developed primarily for the assessment of students in years 5–10, but because it tests curriculum levels 2–6 it can be used for students in lower and higher year levels. The revised e-asTTle writing tool (2012) assesses curriculum levels 1–6.

Each assessment is constructed by a teacher from options provided by the tool. An assessment form can be used to represent a teacher's unique construct of an assessment.

2.1.3.1 Sample Data Elements – asTTle Assessment Result

| | | | |
|------------------------|---------------------|-------------|--|
| Assessment Task | Assessment Family | Code | asTTle |
| | | Description | Assessment Tools for Teaching and Learning |
| | Learning Area | | Reading |
| | Learning Standard | RefId | <Not Applicable> |
| | | Code | |
| | | Title | |
| | | Authority | |
| | Assessment Form | RefId | XYZ0078945 |
| | | Code | 123456 (<i>asTTle generated</i>) |
| | | Title | Mr Smith's asTTle Reading Test |
| | Session Date | | 10 June 2016 |
| | Assessment Provider | Code | 247 |

| | | |
|---------------------------|-------------------|--------------|
| Student Assessment | Performance Level | 3, 4, 5 |
| | Assessment Date | 10 June 2016 |
| | Result Date | 12 June 2016 |

| | | | |
|---------------------|------------|-------------|------------------|
| Result Score | Metric | | Curriculum Level |
| | Value | | 5B |
| | Competency | RefId | |
| | | Description | Overall |
| Result Score | Metric | | Score |
| | Value | | 1591 |
| | Competency | RefId | |
| | | Description | Overall |
| Result Score | Metric | | Curriculum Level |
| | Value | | 5B |
| | Competency | RefId | |
| | | Description | Ideas |

| | | | |
|---------------------|------------|-------------|-------|
| Result Score | Metric | | Score |
| | Value | | 1234 |
| | Competency | RefId | |
| | | Description | Ideas |

2.1.4 IKAN - Individual Knowledge Assessment of Number

| | | |
|-------------------|--|--|
| Assessment Family | IKAN - Individual Knowledge Assessment of Number | |
| Learning Area | Mathematics | |
| Assessment Forms | IKAN1 IKAN2 IKAN3 IKAN4 | |
| Competencies | Number Sequence and Order Fractions Place Value Basic Facts | |
| Score Metrics | Number Knowledge Stage | Knowledge stages describe key items of knowledge which students need to know and be able to quickly recall without needing to strategize. Values: <ul style="list-style-type: none">○ Stage 4○ Stage 5○ Stage 6○ Stage 7○ Stage 8 |
| Assessment Result | An Assessment Result is for one IKAN Form and consists of Number Knowledge Stage scores for each of the four knowledge domains - Number Sequence and Order, Fractions, Place Value, and Basic Facts. | |

2.1.4.1 Assessment Example – IKAN

A student is enrolled at Hogwarts School in year 5 for the 2016 academic year; they participate in an IKAN assessment for Mathematics. The student takes the IKAN4 test on 10th October 2016, and gains the following results:

| Knowledge Domain | Number Knowledge Stage |
|---------------------------|------------------------|
| Number Sequence and Order | 7 |
| Fractions | 6 |
| Place Value | 7 |
| Basic Facts | 6 |

2.1.4.2 Sample Data Elements – IKAN Assessment Result

| | | | |
|------------------------|---------------------|-------------|---|
| Assessment Task | Assessment Family | Code | IKAN |
| | | Description | Individual Knowledge Assessment of Number |
| | Learning Area | | Mathematics |
| | Learning Standard | RefId | <Not Applicable> |
| | | Code | |
| | | Title | |
| | | Authority | |
| | Assessment Form | RefId | |
| | | Code | IKAN4 |
| | | Title | |
| | Session Date | | 10 October 2016 |
| | Assessment Provider | Code | 247 |

| | | | |
|---------------------------|-------------------|--|------------------|
| Student Assessment | Performance Level | | <Not Applicable> |
| | Assessment Date | | 10 October 2016 |
| | Result Date | | 12 October 2016 |

| | | | |
|---------------------|------------|-------------|---------------------------|
| Result Score | Metric | | Number Knowledge Stage |
| | Value | | 7 |
| | Competency | RefId | |
| | | Description | Number Sequence and Order |
| Result Score | Metric | | Number Knowledge Stage |
| | Value | | 6 |
| | Competency | RefId | |
| | | Description | Fractions |
| Result Score | Metric | | Number Knowledge Stage |
| | Value | | 7 |
| | Competency | RefId | |
| | | Description | Place Value |
| Result Score | Metric | | Number Knowledge Stage |
| | Value | | 6 |
| | Competency | RefId | |
| | | Description | Basic Facts |

2.2 Secondary Sector Data Requirements

Requirements in this section refer to senior secondary school only, ie years 11 to 13.

The following NZ standards have been included in order to formulate data requirements:

- National Certificate of Educational Achievement (NCEA)
- Awards - Scholarship, University Entrance

Qualifications offered by the following International organisations are also considered

- Cambridge International Examinations

Not yet completed - International Baccalaureate

The intention is to also include data requirements and validate the data concepts for International Baccalaureate

2.2.1 NCEA – National Certificate in Educational Achievement

2.2.1.1 Example Scenario – Achievement Standard

A student enrolls in NCEA Level 2 at Hogwarts High for the 2016 Academic Year.

The student enrolls in several courses that provide credits towards NCEA Level 2 – one of these courses is Chemistry.

Part way through the year, the student has attained the following Assessment Results

| | |
|--------------------------------|--------------|
| Programme | NCEA Level 2 |
| Total Credits Attained | 32 |
| Total Credits Attempted | 36 |
| Total Literacy Credits | 16 |
| Total Numeracy Credits | 20 |

| | |
|------------------------|---|
| Component | Chemistry 12CHE |
| Education Level | NCEA Level 2 |
| | |
| | Achievement Standard 91165 |
| | Version v2 |
| | Title Demonstrate understanding of the properties of selected organic compounds |
| | Credit Value 4 |
| | Assessment Mode External |
| | Result <not yet assessed> |
| | Date |
| | |
| | Achievement Standard 91166 |
| | Version v2 |
| | Title Demonstrate understanding of chemical reactivity |
| | Credit Value 4 |
| | Assessment Mode External |
| | Result Achieved with merit |
| | Date 01 June 2016 |
| | |
| | Achievement Standard 91167 |
| | Version v2 |
| | Title Demonstrate understanding of oxidation-reduction |
| | Assessment Mode Internal |
| | Credit Value 3 |
| | Result Achieved |
| | Date 05 July 2016 |

2.2.1.2 Sample Data Elements – NCEA Assessment Result for Achievement Standard

For each Learning Standard - note Achievement Standards (NAME) have a different metric from Unit Standards (NA):

| | | | |
|-----------------|---------------------|-----------------|--|
| Assessment Task | Assessment Family | Code | NCEA |
| | | Description | National Certificate in Educational Achievement |
| | Learning Area | | Chemistry |
| | Learning Standard | RefId | ZXX4544 |
| | | Code | 91166 v2 |
| | | Title | Demonstrate understanding of chemical reactivity |
| | | Authority | NZQA |
| | | Credit Value | 4 |
| | | Education Level | 2 |
| | Assessment Form | RefId | <not applicable> |
| | | Code | |
| | | Title | |
| | Session Date | | 1 Dec 2016 |
| | Assessment Provider | Code | 247 |
| | Assessment Mode | | External |

| | | | |
|--------------------|-------------------|--|-------------|
| Student Assessment | Performance Level | | |
| | Assessment Date | | 1 Dec 2016 |
| | Result Date | | 18 Dec 2016 |

| | | | |
|--------------|------------|-------------|---------------------|
| Result Score | Metric | | NAME (NCEA Grade) |
| | Value | | Achieved with merit |
| | Status | | Final |
| | Competency | RefId | |
| | | Description | |

2.2.1.3 Sample Data Elements – NCEA Assessment Result for Unit Standard

For each Learning Standard – note Unit Standards have a different metric (NA) from Achievement Standards (NAME)

| | | | |
|-----------------|---------------------|-----------------|---|
| Assessment Task | Assessment Family | Code | NCEA |
| | | Description | National Certificate in Educational Achievement |
| | Learning Area | | Health Studies |
| | Learning Standard | RefId | ZXX4599 |
| | | Code | 6402 v2 |
| | | Title | Provide Resuscitation Level 2 |
| | | Authority | NZQA |
| | | Credit Value | 1 |
| | | Education Level | 1 |
| | Assessment Form | RefId | <not applicable> |
| | | Code | |
| | | Title | |
| | Session Date | | 28 Aug 2017 |
| | Assessment Provider | Code | 247 |
| | Assessment Mode | | Internal |

| | | | |
|--------------------|-------------------|--|------------|
| Student Assessment | Performance Level | | Level 1 |
| | Assessment Date | | |
| | Result Date | | 1 Oct 2016 |

| | | | |
|--------------|------------|-------------|--|
| Result Score | Metric | | NA |
| | Value | | Achieved |
| | Status | | Final |
| | Competency | RefId | |
| | | Description | Overall |
| Result Score | Metric | | NA |
| | Value | | Achieved |
| | Status | | Final |
| | Competency | RefId | |
| | | Description | Management of Environmental Conditions |

2.2.2 Cambridge Mathematics

The student also takes up an offer to enrol in a Mathematics course which provides a qualification for Cambridge Advanced Subsidiary Level Mathematics (AS) plus credits towards NCEA Level 2 Mathematics.

2.2.2.1 Example Scenario - Cambridge AS Assessment

| | | |
|---------------------|--------------------------|------------------------------|
| | Learning Standard | P1 |
| | Version | 2016 |
| | Title | Pure Mathematics 1 |
| | Result | 68% |
| | Date | 10 October 2016 |
| | | |
| | Learning Standard | S1 |
| | Version | 2016 |
| | Title | Probability and Statistics 1 |
| | Result | 72% |
| | Date | 20 October 2016 |
| Grade Result | | B |
| Date | | 10 Dec 2016 |

2.2.2.2 Sample Data Elements – Cambridge Maths Assessment Result

For each Learning Standard

| | | | |
|------------------------|---------------------|-------------|--------------------------------------|
| Assessment Task | Assessment Family | Code | |
| | | Description | Cambridge |
| | Learning Area | | Mathematics |
| | Learning Standard | RefId | |
| | | Code | 9709 |
| | | Title | |
| | | Authority | Cambridge International Examinations |
| | Assessment Form | RefId | |
| | | Code | |
| | | Title | June 2017 Paper 1 |
| | Assessment Date | | 10 June 2017 |
| | Assessment Provider | Code | 247 |
| | Assessment Mode | | External |

| | | |
|---------------------------|-------------------|---------------|
| Student Assessment | Performance Level | AS |
| | Result Date | 1 August 2017 |

| | | | |
|---------------------|------------|-------------|-------------------------------|
| Result Score | Metric | | Grade |
| | Status | | Final |
| | Value | | A* |
| | Competency | RefId | |
| | | Description | Overall |
| Result Score | Metric | | Percentage |
| | Value | | 95 |
| | Status | | Final |
| | Competency | RefId | |
| | | Description | Overall |
| Result Score | Metric | | Raw Score |
| | Value | | 72 |
| | Status | | Final |
| | Competency | RefId | |
| | | Description | P1 Pure Maths |
| Result Score | Metric | | Raw Score |
| | Value | | 47 |
| | Status | | Final |
| | Competency | RefId | |
| | | Description | S1 Probability and Statistics |

2.2.3 Secondary Sector - Achievement

This section describes a student's achievements attained following assessment of learning in Programmes and Courses. A student's high school qualifications and achievements show the following:

- National Certificate of Educational Achievement (Level 2) achieved with merit 10 Jan 2017
- NCEA Course Endorsement in Chemistry Endorsed with excellence at Level 2 10 Jan 2017
- New Zealand University Entrance 10 Jan 2017

2.2.3.1 Sample Data Elements – Attainment

| | | | |
|---------------------------|--------------------|-------------|---|
| Student Attainment | Award | Code | 0973 |
| | | Description | National Certificate of Educational Achievement (Level 2) |
| | Endorsement | | Achieved with merit |
| | Awarded Date | | 10 Jan 2017 |
| | Education Level | | Level 2 |
| | Provider Authority | | NZQA |

| | | | |
|---------------------------|--------------------|-------|---|
| Justification List | Student Assessment | RefId | A1 (->91161 qualitative analysis. 4 credits achieved with merit) |
| | Student Assessment | RefId | A2 (-> 91165 organic compounds.. 4 credits achieved with merit) |
| | Student Assessment | RefId | B5 (-> 91261 algebraic methods.. 4 credits achieved with merit) |
| | Student Assessment | RefId | B6 (-> 91262 calculus methods.. 5 credits achieved with excellence) |
| | Student Assessment | RefId | etc ... |

3 Logical Data Model

The concepts introduced in the conceptual models and data requirements examples above are realised in the StudentAssessmentRegistration, AssessmentTask, StudentAssessmentTask, StudentAssessmentTaskResult & StudentAttainment data objects.

3.1 Assessment Logical Data Model

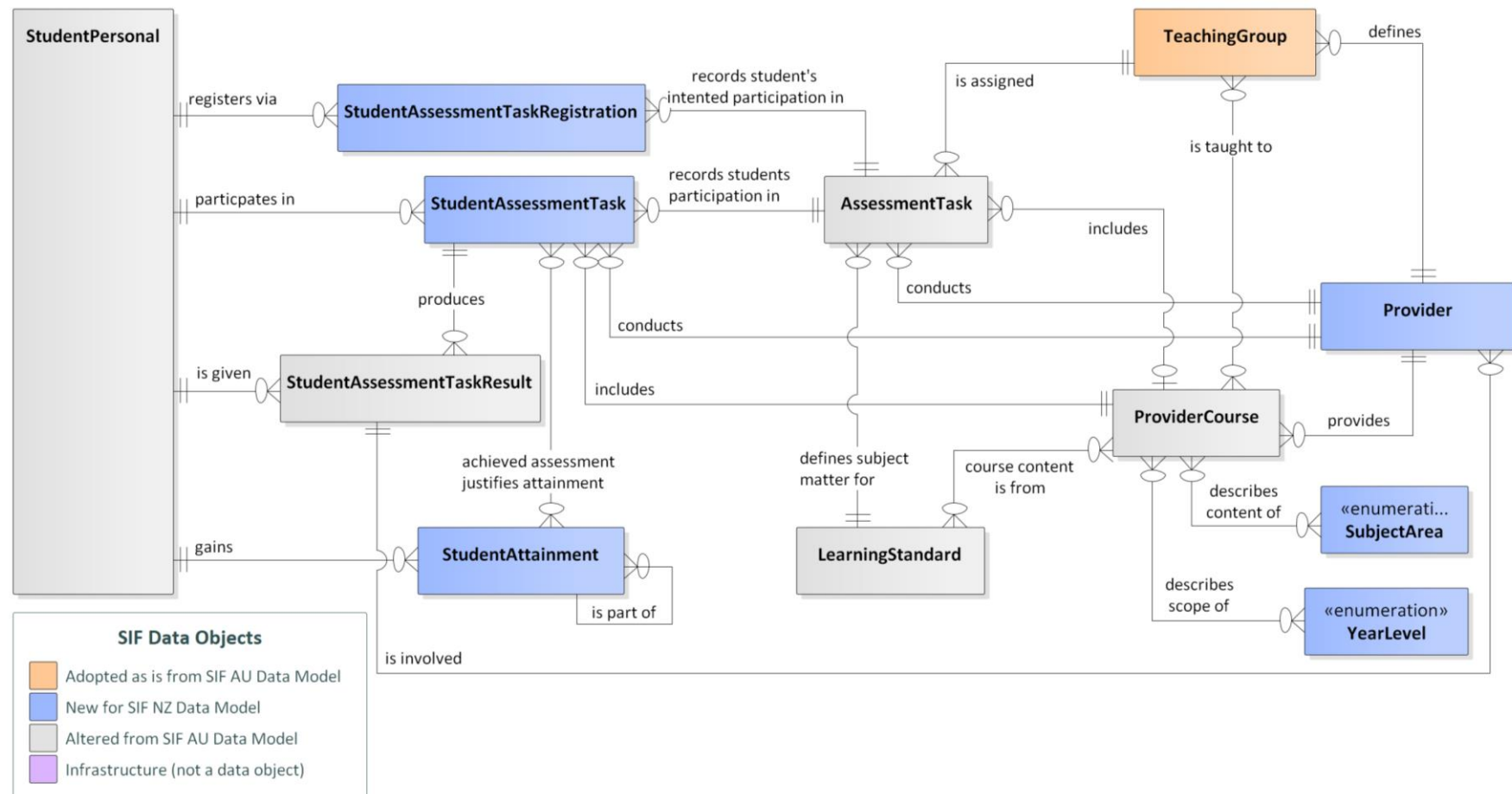


Figure 4: Assessment - Logical Model

3.2 Attainment Logical Data Model

StudentAttainment records the Student having “Passed” an AssessmentTask, a particular LearningStandard, a particular ProviderCourse or being granted a particular Credential.

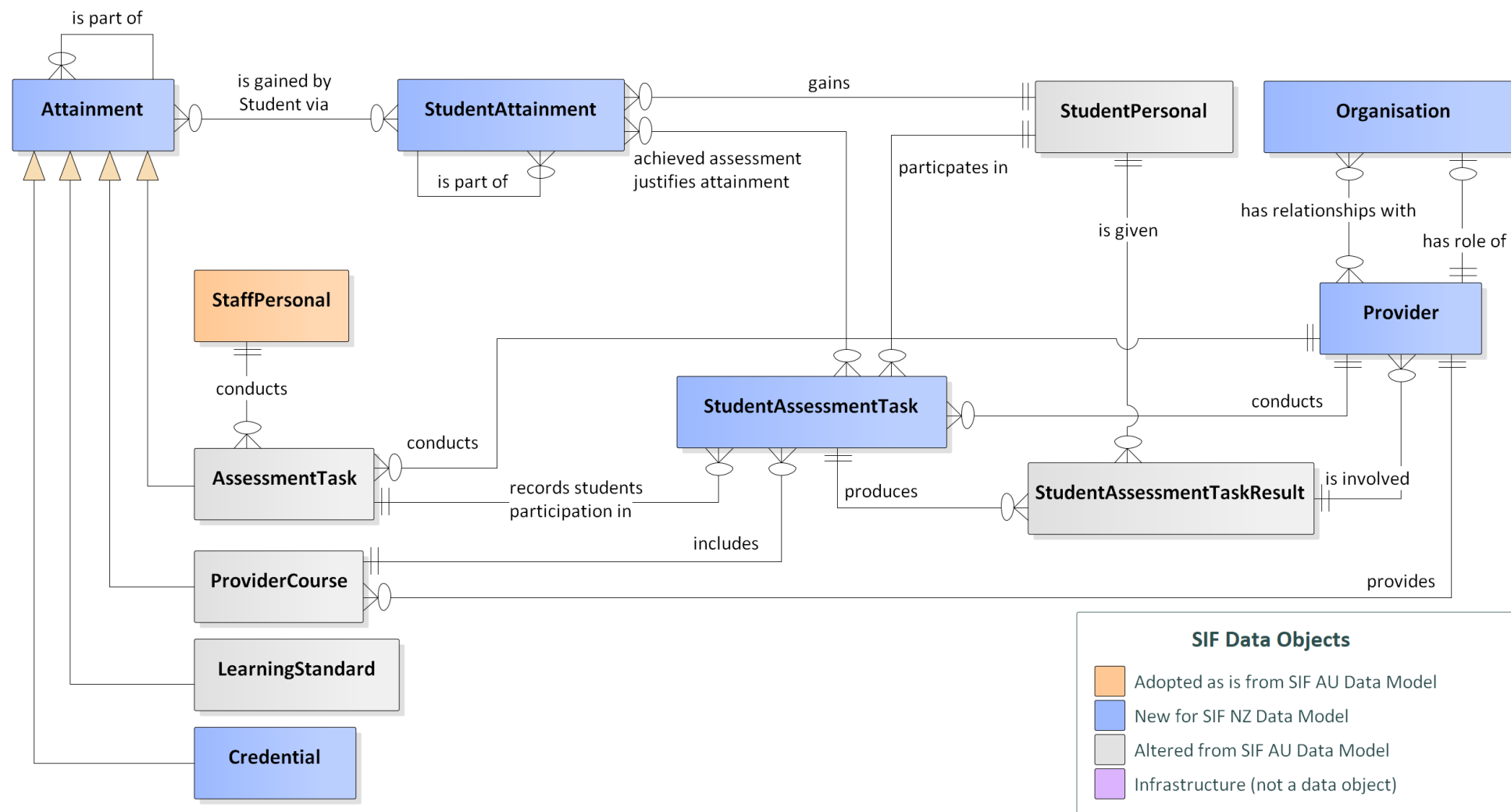


Figure 5: Attainment - Logical Model

4 Assessment Task Data Object

From the conceptual and logical models and data requirements presented above, the AssessmentTask data object is implemented (with matching API endpoints), as depicted:

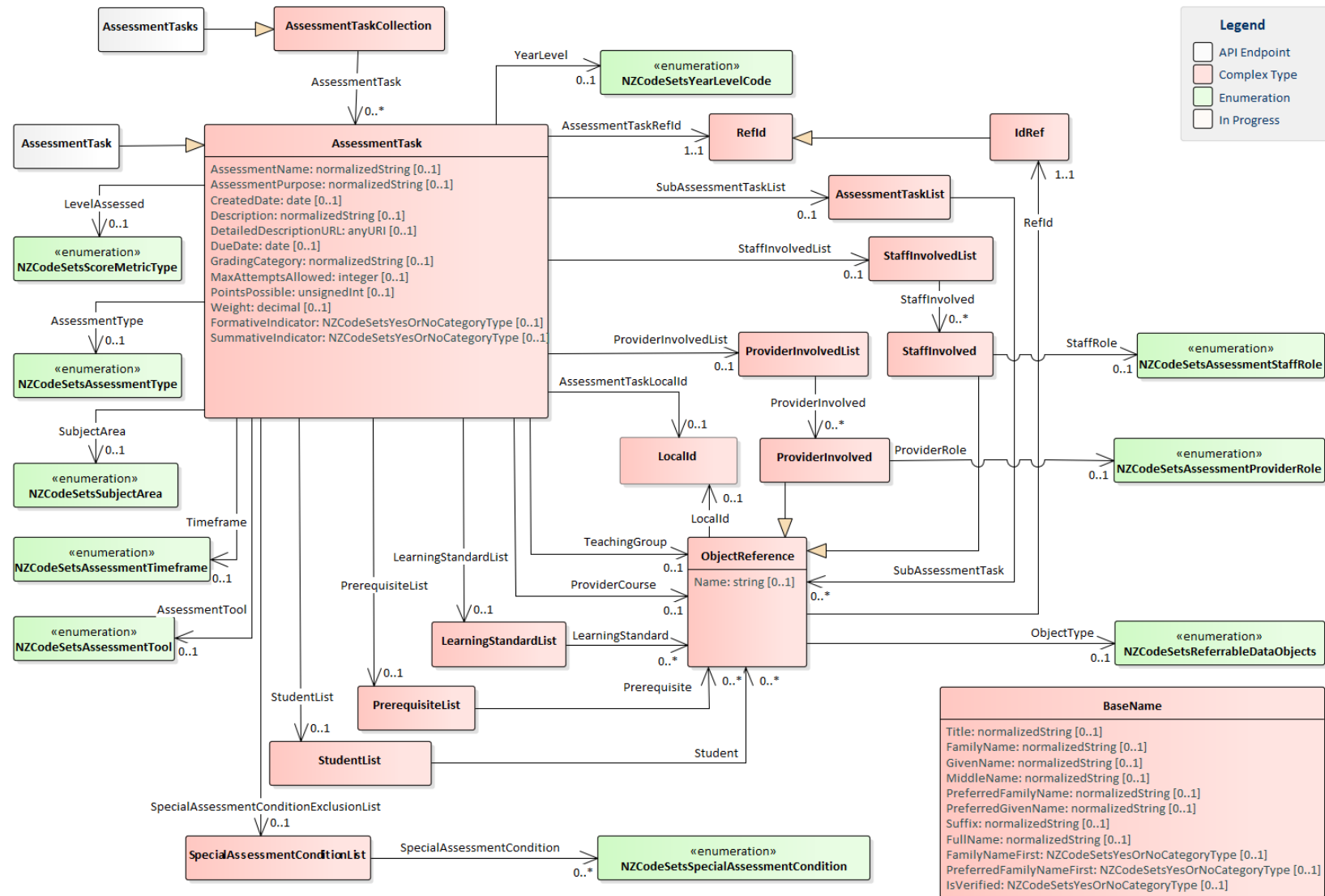


Figure 6: Assessment Task Data Object

5 Student Assessment Task Registration Data Object

When an assessment is conducted by or on behalf of an external agency (e.g. NZQA or Cambridge Education), then details of a Student's registration to be assessed at some point in the future are recorded in the StudentAssessmentTaskRegistration data object (with matching API endpoints):

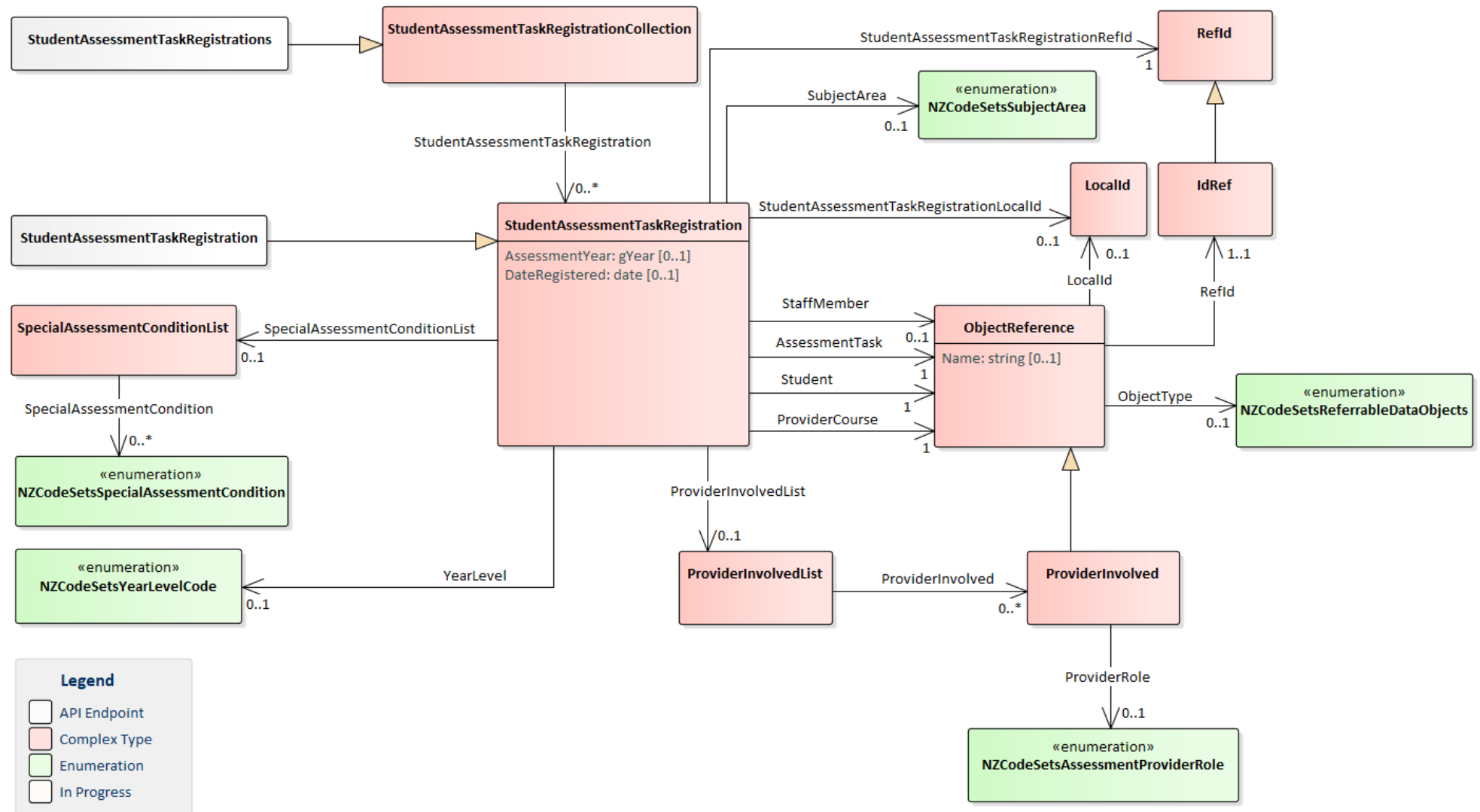


Figure 7: Student Assessment Task Registration Data Object

7 Student Assessment Task Result

Once an assessment has been conducted, each Student's results are recorded in the StudentAssessmentTaskResult data object (with matching API endpoints):

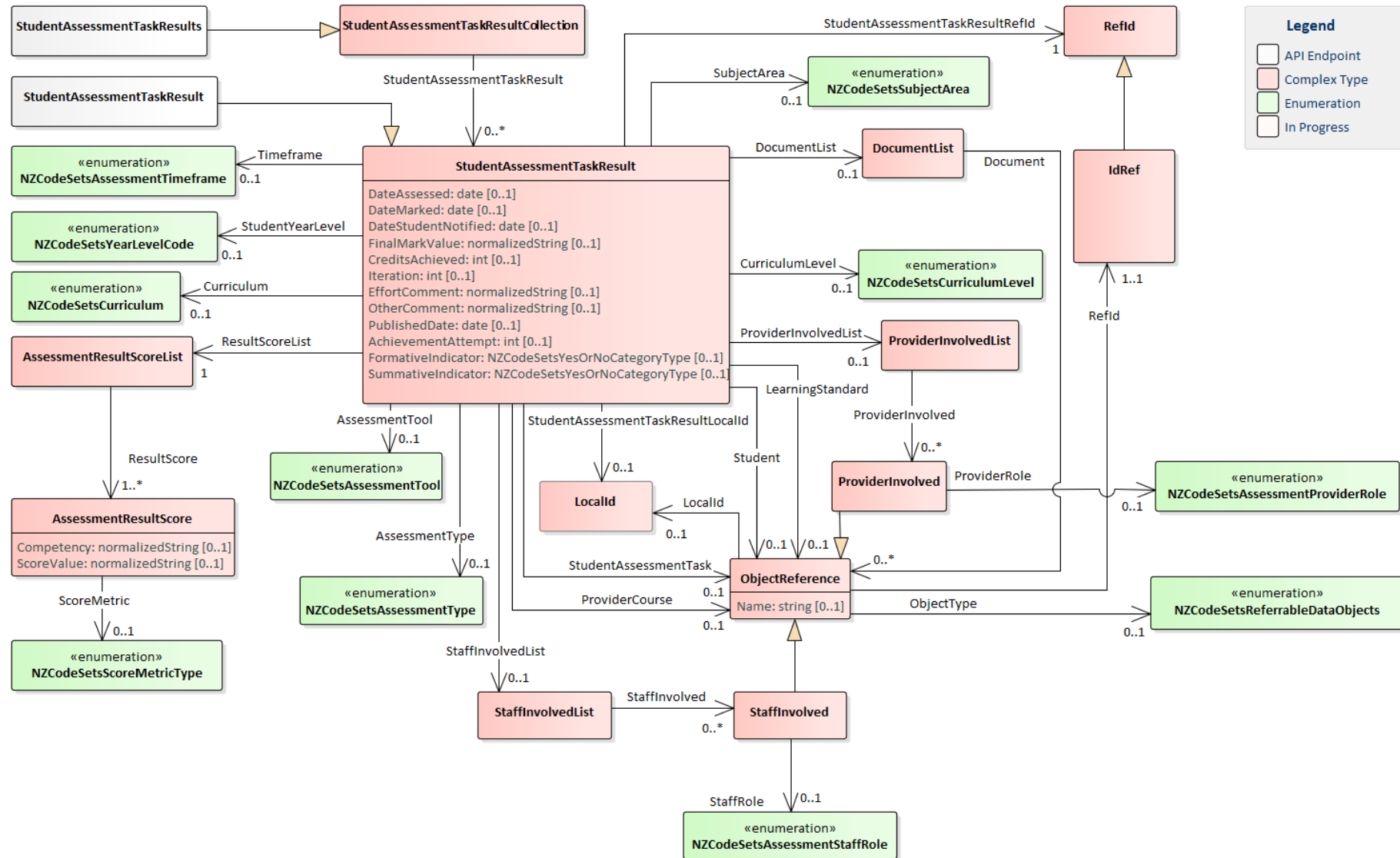
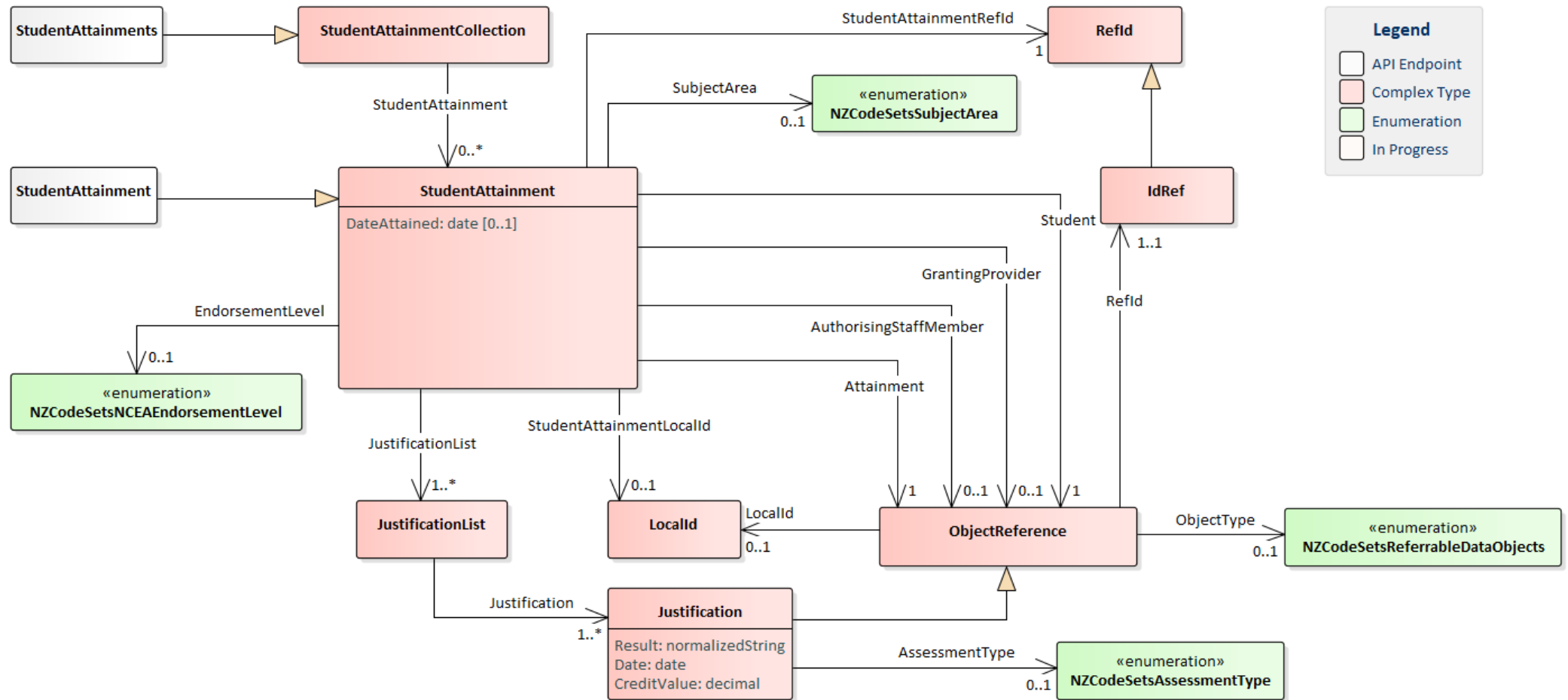


Figure 9: Assessment Task Result Data Object

8 Student Attainment Data Object

A student's achievement of qualifications or credentials (e.g. NCEA Level 1, by accruing sufficient credits from LearningStandard based AssessmentTasks) are recorded in the StudentAttainment data object (with API endpoints).



The Attainment object reference refers to any one of the following data objects:

- **Assessment Task** – to record the Student having achieved passed a particular assessment.
- **Learning Standard** – to record the Student having achieved a particular learning standard; (e.g. 91162 v2 (2.2) – Carry out procedures to identify ions present in solution).
- **Provider Course** – to record the Student having passed a particular course; (e.g. NCEA Level 2 Chemistry with Merit).
- **Credential** – to record the Student having been granted a qualification or other credential; (e.g. NCEA Level 2 with Excellence).

The JustificationList set of object references refers to any of the following data objects:

- **StudentAssessment** – to record the student's favourable assessment having contributed to the granting of the Credential.
- **AssessmentTaskResult** – to record the student's actual assessment score having contributed to the granting of the Credential.
- **LearningStandard** – to record the student's passing a particular Learning Standard (irrespective of assessment score) having contributed to the granting of the Credential.

9 Document Control

9.1 Amendment History

| Version No | Description of Change | Changed By | Date |
|------------|---|-----------------|-------------|
| 0.1 | Assembled from various working documents as part of SIF NZ Data Model v3.0.1 publication process. | Stuart McGrigor | 29 Oct 2018 |
| 1.0 | Using generic object references; updated to match SIF NZ v3 (rc1). | Stuart McGrigor | 4 Jul 2019 |
| 1.1 | Updated to match SIF NZ v3 (rc2). Names of RefId and LocalIds changed to be unique for each object. | Amy Orr | 11 Jul 2019 |

9.2 Glossary of Terms – NZ Education Sector

The following are terms adopted by NZQA and education sector agencies with respect to programmes, qualifications and assessments.

[Ref: <http://www.nzqa.govt.nz/assets/Providers-and-partners/Registration-and-accreditation/guidelines-approval-programme-accred.pdf>]

| | |
|------------------------------------|---|
| Achievement standard | A coherent set of learning outcomes and associated assessment criteria, together with technical and management information that supports delivery and assessment; achievement standards specify three different standards of performance and the method of assessment, which may include national external assessment. |
| Assessment standard | The collective term for unit standards and achievement standards listed on the NZQA Directory of Assessment Standards. |
| Components | Parts of a programme (or training scheme), which together make up a coherent arrangement of learning or training. Components include projects, papers, courses, modules, practicum and skill and assessment standards |
| Industry training organisation | A body recognised by the Tertiary Education Commission under the Industry Training Act 1992 as having responsibility for setting standards and arranging the delivery of industry training for a specific industry or area of industry identified in a Tertiary Education Commission gazette notice. |
| New Zealand certificate or diploma | A qualification that meets the requirements for listing on the NZQF at Levels 1-6. |
| Programme (approved) | An approved programme is a coherent arrangement of learning or training that is based on clear and consistent aims, content, outcomes and assessment practices, which leads to a qualification listed on the NZQF. A “programme” in this document is a “course” in terms of sections 258 and 259 of the Education Act 1989. |
| Qualification | Formal certification for a given purpose of the achievement of specified learning outcomes to a given standard. |
| Qualification strand | A specialisation within a qualification that represents a major component of the qualification, and is at the level of the qualification. Strands are documented through strand-specific outcomes in the graduate profile. |
| Quality assurance body | NZQA or New Zealand Vice-Chancellors’ Committee (also known as Universities New Zealand). |
| Stakeholders | Individuals, groups, or organisations with an interest (or “stake”) in the outcome of a qualification. |

9.3 Related Documents

| Document Title | Link |
|--|---|
| National Standards Data Set Definition for Overall Teacher Judgment and Assessments [v1.0 May 2010] | |
| ESDM: Qualification and Standard Definition Logical Model Report Draft Version 0.8 | ESDM in FileNet |
| ESDM: Results Logical Report Draft Version 0.8 | ESDM in FileNet |
| SRT Assessment and Attendance XML Schema | SRT Business Support Team |
| NZQA Secondary Schools Data Exchange Specifications Manual (Feb 2016) | NZQA |
| NZQA Guidelines for applying for approval of programmes leading to NZ qualifications at levels 1-6 on the NZQF | NZQA Guidelines |
| Common Education Data Standards | https://ceds.ed.gov/ |
| NZ Maths | https://nzmaths.co.nz/ |
| TKI Assessment Online | http://assessment.tki.org.nz/ |
| NZCER STAR Reading Test | http://www.nzcer.org.nz/tests/star |
| 2015 for 2016 Roll Return Specification Manual v.22.2 | FileNet Link |