

Provision for less able students of English and Mathematics

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This report is best printed in colour.

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1. Introduction

This investigation explores provision in English and Mathematics for less able students, focusing primarily on the 14 to 16 age group. It considers education provided in the medium of English language only, and addresses four main research questions.

Research questions

RQ1. What are less able students of English and Mathematics currently offered by Cambridge Assessment?

RQ2. What else are less able students of English and Mathematics currently offered by the other major awarding bodies in England?

RQ3. What are less able students of English and Mathematics currently offered in the highest performing jurisdictions around the world?

RQ4. How are less able students taught?

Websites and other on-line resources were reviewed during May and June 2013 in order to collate information relevant to these questions. Section 2 of the report addresses RQ1 and RQ2. Sections 3 to 8 address RQ3 and RQ4 as far as possible, focusing on four high performing jurisdictions:

- Singapore
- New Zealand
- Alberta, Canada
- Hong Kong.

2. Qualifications offered by OCR, CIE, AQA and Edexcel

Summary

In England multiple formal qualifications in English and Mathematics are available for less able 14-16 year olds at Entry level, Level 1 and Level 2. These include Entry Level Certificates, Cambridge Progression, and Functional Skills qualifications, as well as GCSEs and IGCSEs at lower grades. Internationally, CIE offers IGCSEs and O levels at lower grades, and its Cambridge Secondary 1 curriculum may also be appropriate for some 14-16 year olds.

The tables within this section summarise the qualifications in English (Tables 2.1 - 2.3) and Mathematics (Tables 2.4 – 2.6) that OCR and CIE offer. The availability of equivalents at AQA and Edexcel are also indicated.

Table 2.2: OCR's General Qualifications in English at Entry Level, Level 1, and Level 2

| Course/Qualification | Target group includes 14-16 year olds | Includes internal assessment (externally moderated) | Includes external assessment | Assesses reading | Assesses writing | Assesses speaking | Assesses listening | Significant focus on literature | AQA equivalent | Edexcel equivalent |
|--|---------------------------------------|---|------------------------------|------------------|------------------|-------------------|--------------------|---------------------------------|----------------|--------------------|
| Entry Level Certificate in English | * | * | | * | * | * | * | | * | * |
| Entry Level Certificate in Adult Literacy | * | * | | * | * | * | * | | * | * |
| Certificate in Adult Literacy at Level 1 or Level 2 | | | * | * | * | | | | | * |
| Cambridge Progression: OCR Cambridge Award/ Certificate in English | | * | * | * | * | * | * | | | |
| Functional Skills | * | * | * (at L2 & L3) | * | * | * | * | | * | * |
| GCSE English | * | * | * | * | * | * | * | * | * | * |
| GCSE English Language | * | * | * | * | * | * | * | | * | * |
| GCSE English Literature | * | * | * | * | * | | | * | * | * |
| Living Texts Level 1/2 Certificate | * | * | | * | * | | | * | | |

Table 2.3: CIE's General Qualifications in English at Stages 7 to 11

| Course/Qualification | Target group includes 14-16 year olds | Includes internal assessment (externally moderated) | Includes external assessment | Assesses reading | Assesses writing | Assesses speaking | Assesses listening | Significant focus on literature | AQA equivalent | Edexcel equivalent |
|--|---------------------------------------|---|------------------------------|------------------|------------------|-------------------|--------------------|---------------------------------|----------------|--------------------|
| Cambridge Secondary 1 Progression Tests | | * | | * | * | | | | | * |
| Cambridge Checkpoint (for Secondary 1 Curriculum) | | | * | * | * | | | | | * |
| Cambridge IGCSE First Language English | * | * | * | * | * | Optional* | Optional* | | | * |
| Cambridge IGCSE First Language English (UK market) | * | * | * | * | * | * | * | | * | * |
| Cambridge IGCSE Literature (English) | * | * | * | * | * | | | * | | * |
| Cambridge IGCSE Literature (English) (UK market) | * | | * | * | * | | | * | * | * |
| Cambridge IGCSE World Literature | * | * | * | * | * | * | * | * | | |
| Cambridge O level English Language | * | | * | * | * | | | | | |
| Cambridge O level Literature in English | * | | * | * | * | | | * | | |

Optional*: Does not contribute to the overall IGCSE grade that candidates receive. Instead, where candidates perform to an appropriate standard, certificates record achievement of grades 1 (high) to 5 (low).

Table 2.5: OCR's General Qualifications in Mathematics at Entry Level, Level 1, and Level 2

| Course/Qualification | Target group includes 14-16 year olds | Includes internal assessment (externally moderated) | Includes external assessment | Calculator paper | Non-calculator paper | AQA equivalent | Edexcel Equivalent |
|--|--|--|-------------------------------------|-------------------------|-----------------------------|-----------------------|---------------------------|
| Entry Level Certificate in Mathematics) | Not stated | * | | * | * | * | * |
| Entry Level Certificate in Adult Numeracy | * | * | | * | * | | * |
| Certificate in Adult Numeracy | | | * | | * | | * |
| Cambridge Progression: OCR Cambridge Award/ Certificate in Mathematics | | | * | * | * | | |
| Functional skills Mathematics | * | * | * | * | | * | * |
| | | (at entry level) | (at L1 & L2) | | | | |
| GCSE Mathematics A | * | | * | * | * | * | * |
| GCSE Mathematics B | * | | * | * | * | * | * |
| GCSE Applications of Mathematics (linked pair pilot) | * | | * | * | | * | * |
| GCSE Methods in Mathematics (linked pair pilot) | * | | * | * | * | * | * |
| FSMQ Foundations of Advanced Mathematics | * | | * | * | | * | |

Table 2.6: CIE's General Qualifications in Mathematics at Stages 7 to 11

| Course/Qualification | Target group includes 14-16 year olds | Includes internal assessment (externally moderated) | Includes external assessment | Calculator paper | Non-calculator paper | AQA equivalent | Edexcel Equivalent |
|---|--|--|-------------------------------------|-------------------------|-----------------------------|-----------------------|---------------------------|
| Cambridge Secondary 1 Progression Tests | | * | | | | | * |
| Cambridge Checkpoint (for Secondary 1 Curriculum) | | | * | * | * | | * |
| Cambridge IGCSE Mathematics | * | | * | * | | | * |
| Cambridge IGCSE Mathematics with coursework | * | * | * | * | | | |
| Cambridge IGCSE Additional Mathematics | * | | * | * | | | * |
| Cambridge IGCSE International Mathematics | * | | * | * | * | | * |
| Cambridge O Level Mathematics D | * | | * | * | * | | * |
| Cambridge O Level Mathematics Additional | * | | * | * | | | |
| Cambridge O Level Statistics | * | | * | * | | | |

3. The Foundation Learning pathway in England

Summary

In England a wide range of courses and qualifications are available for 14-16 year olds. Some less able students are offered extra support in taking mainstream general qualifications in English and Mathematics, such as GCSEs. Other less able students follow a Foundation Learning pathway in which they are offered formal qualifications at lower levels, often focusing on core or functional skills. Some of the latter qualifications are at a considerably lower level than those offered in other jurisdictions. Some less able students progress to Level 2 general qualifications. Others progress to vocational pathways.

3.1 Introduction

In England there are currently four¹ national suites of provision for 14 to 19 year olds:

- GCSEs and A-levels
- Diplomas
- Apprenticeships
- Foundation Learning

Foundation Learning (FL) is the name given to education provision at Entry Level and Level 1, and includes the qualifications at these levels within the Qualifications and Credit Framework (QCF)². FL is aimed at the weakest 20-25% of learners, including those with Special Educational Needs (SEN), those who are at risk of not engaging, and those with 'spiky' profiles of attainment in different areas³. Foundation learners are usually expected to progress to one of the other three national suites, although some may move on to supported employment or independent living. For 14 to 16 year-olds, FL is also intended to support the aims of the National Curriculum for Key Stage 4.

Personalised programmes are developed for individual learners, which are tailored to their particular needs, interests and aspirations. Programmes should incorporate three key components:

- vocational/subject learning

¹ Additionally, traineeships will be introduced from August 2013 for 16- to 19-year-olds. This new programme is for young people who want to work, but who need extra help to gain an apprenticeship or job. For further information see: <http://www.education.gov.uk/childrenandyoungpeople/youngpeople/qandlearning/traineeships/a00219695/traineeships->

² From: <http://www.excellencegateway.org.uk/foundationlearning>

³ See: Foundation learning: A guide. Department for Children, Skills and Families. Crown copyright 2010. Additionally, whilst from a pre-16 perspective learners are significantly more likely to be male than female, they are not selected on this basis. Selection is based upon learners having achieved significantly below the national average at Key Stage 3 and/or having behavioural characteristics that make them suitable for FL. (Allan, T., et al. (2010) *Foundation Learning National Evaluation*. Research Report DFE-RR130)

- personal and social development
- functional skills (English, Mathematics, ICT) either as stand-alone qualifications or integrated within GCSE courses

The choice of component units and qualifications, including the level and size of those qualifications, should be matched to the learner's intended destination. Both the content and duration of learning programmes are flexible, to suit individual needs. Some learners may take an FL programme which includes a mix of GCSEs and other courses, to support progression onto a full GCSE programme or Diploma. Programmes can be revised as the learner progresses, and on-going advice, guidance and support are an integral part of FL.

3.2 National Evaluation of foundation learning

In October 2010, a month after GCSEs with integrated functional skills were first taught in schools, an extensive national evaluation of FL was conducted⁴. The evaluation was completed in April 2011 and included:

- a telephone survey of FL leads in 149 local authorities across England
- an online survey of pre-16 and post-16 providers delivering FL in 2010/11 (292 responses)
- consultations with ten employers and feedback (written and face-to-face) from 15 parents/carers of FL learners
- fourteen local authority-based FL case studies
- statistical analyses of the characteristics, attainment and progression of learners on FL programmes, compared with control groups of similar learners.

The key *general* findings were:

- Most providers delivering FL were doing so through 'full' programmes comprising vocational, PSD and functional skills qualifications. Most were also doing so using units and qualifications drawn largely from the QCF.
- Whilst the visibility and profile of FL and its learners was growing, issues of perception and reputation remained, with staff in some providers unwilling to engage and parents reportedly expressing their preference for their child to do a full suite of GCSEs rather than FL.
- Completing an FL programme could appear to have a slightly negative effect on learners' chances of achieving a full Level 2 (five GCSEs at grade A*-C or equivalent) or full Level 1 (five GCSEs at grades A*-G) qualification, and on their total GCSE point scores. Specifically, 15% of FL learners achieved a full Level 2 compared with 20% of learners of similar ability, and 51% of FL learners achieved a full Level 1 compared with 56% of similar learners. FL learners achieved an average of 201 points at Key Stage 4 compared with an average of 207 points for non-FL learners.

⁴Allan, T., et al. (2010) *Foundation Learning National Evaluation*. Research Report DFE-RR130

- This apparently negative impact was most evident for more able learners and those with no special educational needs. However, it was explained to some extent by the fact that the credit values of FL qualifications are lower than for GCSEs, even at grades D to G.
- Completing an FL programme had a positive effect on learners with low levels of prior attainment at Key Stage 3. For these learners, participating in FL increased their odds of achieving a qualification (of any sort) at the end of compulsory schooling.
- Participating in FL was not associated with increased odds of continuing in education or training post-16. However, no data was available on progression rates to other positive destinations, including supported employment and independent living, which would provide a more rounded and holistic picture.

The key findings relating to *Mathematics and English* were:

- Functional skills was the most challenging element of FL to deliver due to a widespread view that the qualifications are pitched at too high a level.
- Among learners, functional skills or equivalent qualifications were the least favoured component of FL, although most learners enjoyed and saw the relevance of functional skills to a greater extent than they did maths and English in their earlier education. This was clearly due, at least in part, to the real-life context within which functional skills tuition was set. It was also because as learners get older, and especially as they make the transition from pre-16 to post-16, they often begin to recognise the importance of English and maths to their employment opportunities and earning potential.
- Many post-16 providers believed the formal assessments for functional skills were leading to non-attendance. Not achieving one or more functional skills (or equivalent) qualifications was often the main reason for post-16 learners not completing a full FL programme. However, FL learners were still more likely to attain functional skills (or equivalent) qualifications in English and maths than other similar non-FL learners.
- A key example of good practice was that of post-16 tutors developing activities and teaching materials for functional skills that were directly related to the vocational area of learners' FL programmes. For example, learners studying retail might complete an exercise to buy their weekly shopping. They would be given a list of items and asked to compare prices online across leading supermarkets to find the best deals. They would then be asked to prepare a presentation and deliver it to the class using PowerPoint. The exercises were seen to combine functional skills in English, maths and ICT, develop personal and social skills as well as practical skills for independent living (shopping and managing budgets).

The national evaluation also included a review of international evidence on the approaches adopted in other countries that have provision comparable with FL. The countries included were:

- Scotland
- Republic of Ireland
- Malta
- Australia
- New Zealand
- South Africa.

Details of provision in each of these countries are given in Appendix B of Allan et al. (2010).

The key findings from the international review were:

- There was found to be limited evidence of the provision of qualifications equivalent to FL programmes as a core component of education and training systems in other countries.
- While there was found to be some provision internationally equivalent to Level 1 in England, there was less evidence of Entry Level equivalent qualifications, in particular at Entry Levels 1 and 2. Furthermore, some countries in Europe have rejected the need to include qualifications at this level.
- Australia, New Zealand and (to a lesser extent) South Africa were found to have provision at either the Entry Levels or Level 1 that is similar to FL, incorporating a vocational element and functional or basic skills components.
- Evidence on the impact of FL equivalent provision in Australia, New Zealand and South Africa revealed a mixed picture of success in relation to attainment and progression. Whilst in New Zealand completion rates on FL-equivalent programmes were found to be relatively low (below 50%), there was nonetheless a link between completion and positive outcomes, including further study or employment. State level activity in Australia appeared to be having a positive effect on progression, although in South Africa there was less evidence of any such link.
- The key drivers of success appeared to be ensuring the content is appropriate, relevant, flexible and appealing, having good quality teaching where teachers engage with learners in a different way from school, and taking into consideration the needs and building on the strengths of learners who access this type of provision.

3.3 Examples of Foundation Learning curricula⁵ in England

Although stand-alone functional skills qualifications are available, many non-selective secondary schools opt for their lower ability students to follow GCSE courses (which have functional skills integrated within them) as part of their FL pathways. Examples 1 and 2 below illustrate this approach. In contrast, some otherwise similar schools enter their least able students for Entry level

⁵ The schools described in this section have not been anonymised because all of the information presented is in the public domain.

qualifications as well as GCSEs, as shown in Example 3 below. Example 4 indicates the courses offered by a school for students with special educational needs.

3.3.1 Example 1: St Clere’s School, Thurrock, Essex⁶

St Clere’s School is a state-maintained co-educational academy school and specialist science college. It caters for around 1000 students of all abilities, aged 11 to 16. In Year 10, while more able students aim to achieve the English Baccalaureate, less able students take the FL curriculum shown in Figure 3.1.

| | | | |
|--|-------------------------|---|------------------------|
| Core | Core | Core | Core |
| English Language GCSE | Mathematics GCSE | Applied Science BTEC Extended Certificate | ICT OCR National Award |
| Core | Core | Core | Core |
| Vocational and Personal Skills for Working Life NOCN Diploma | Physical Education GCSE | Catering GCSE | Sociology GCSE |

Figure 3.1: Curriculum for less able students at St Clere’s School

There are no optional courses for FL students. No additional courses in English and Mathematics are mentioned on the school’s website. However, in addition to the core curricula, all students are expected to read in their own time and to bring their current reading book to school every day. Teachers talk to students about what they are reading and what the teachers themselves are reading.

Formal literacy and numeracy policies are made available to parents and students via the school’s website. These focus on raising the standards of literacy and numeracy throughout the whole-school curriculum.

⁶ Information obtained from: <http://www.st-cleres.thurrock.sch.uk/the-curriculum/foundation-learning/>

3.3.2 Example 2: Parkside Federation, Cambridge⁷

The Parkside Federation runs two state-maintained co-educational secondary academy schools in Cambridge – Coleridge and Parkside – as well as an international sixth form college, Parkside Sixth. The secondary schools are relatively small, with around 600 students each, and cater for students of all abilities. Students entering Year 10 follow one of three pathways:

- English Baccalaureate Pathway
- Level 2 Pathway
- Foundation Pathway

Those on the Foundation Pathway are working at Level 1 and are on target to achieve GCSE grades D to G. The curriculum is shown in Figure 3.2.

| | | | |
|--------------------------------------|---|-------------------------------|--|
| Core | Core | Core | Optional – choose 2 of: |
| Personal Development Programme | ALAN (Aspire, Literacy And Numeracy) | Core Sport Programme | <ul style="list-style-type: none"> • Art: Visual Art GCSE • Construction BTEC level 1 • Dance GCSE • Drama GCSE • Film: Moving Image GCSE • Geography GCSE • History GCSE • Hospitality and Catering GCSE • Health & Social Care BTEC level 1 • Music GCSE • Sport BTEC First Certificate |
| Core | Core | Core | |
| BTEC Science | CIE IGCSE English language (& possibly English literature) | Edexcel GCSE Mathematics A | |

Figure 3.2: Curriculum for less able students at the Parkside Federation

Within ALAN (Aspire, Literacy and Numeracy), ‘English Plus’ is a key skills literacy programme that develops the student’s fluency with reading and writing. This is an accelerated programme with the aim of allowing the students to better access work in the class room and achieve to the best of their ability.

Also within ALAN, ‘Maths Plus’ is a key skills maths programme that develops the learner’s abilities and fluency with numeracy. It is taught through a variety of multisensory techniques which stimulate the learner’s ability and willingness to learn and achieve in maths. This is a programme with the aim

⁷ Information obtained from: <http://www.parksidefederation.org.uk/parkside/uploads/2013/01/Foundation-Pathway-Information-Booklet-2013-FV.pdf>

of allowing the student to better access work in the class room and achieve to the best of their ability.

Literacy and numeracy are assessed at five points over the year, coinciding with assessment days. Assessments last an hour and a half and test the topics covered for each term.

Some students on the Level 2 pathway also take ALAN (instead of GCSE French), in addition to a personal development programme, GCSEs in the three sciences, Mathematics, English, English literature, and two optional GCSE/BTEC courses.

3.3.3 Example 3: Notley High School, Braintree, Essex⁸

Notley High School & Braintree Sixth Form is a heavily over-subscribed co-educational comprehensive school in Braintree, Essex. It gained academy status in August 2011. In Key Stage 4, students follow a core curriculum but are able to exercise a large degree of choice in their option subjects. Although full curricula are not made publically available, information about English and Mathematics in Years 10 and 11 can be obtained via the school's website. As can be seen in Figures 3.3 and 3.4, students are divided into 5 or 6 sets, and take different qualifications accordingly:

English

| Set | Course(s) |
|-----|---|
| 1 | Students are entered for GCSE English Language in November 2013 and GCSE English Literature in June 2014. |
| 2 | |
| 3 | |
| 4 | Students are entered for GCSE English in June 2014 |
| 5 | |
| (6) | Some students take Entry level qualifications in English |

Figure 3.3: English curricula for less able students at Notley High School

⁸Information obtained from: <http://www.notleyhigh.com/curriculum> and <http://www.notleyhigh.com/course-guidance-for-year-10-parents-and-carers-2012-13>

Mathematics

| Set | Course(s) |
|-----|--|
| 1 | Students are entered for Edexcel Mathematics A (1MA0) specification, which is linear, covering D to B level topics in Year 10 and B to A* level topics in Year 11. |
| 2 | |
| 3 | Students are entered for Edexcel Mathematics B (2MB01) specification, which is linear. |
| 4 | 'Foundation' students work towards the foundation tier of Edexcel Mathematics B (2MB01). Over the two years students cover Number, 3D shapes, Expressions, Units and Scales, Ratio and Proportion, Angles and Polygons, Fractions, Decimals and Percentages, Collecting and Displaying Data, Linear Equations Linear Graphs, Patterns and Sequences, Perimeter, Area and Volume, Pythagoras, Quadratics, More Equations, Scatter Graphs, Constructions and Loci, Circles, Averages and Range, Inequalities, Transformations and Probability. |
| 5 | |
| 6 | In Year 10, students work towards OCR Entry Level Mathematics before beginning work on Foundation GCSE. In Year 11, Students continue their Foundation GCSE work, predominantly focusing on E to G level topics. |

Figure 3.4: Mathematics curricula for less able students at Notley High School

3.3.4 Example 4: Ambergate Sports College, Grantham⁹

Grantham Additional Needs Federation comprises of two Grantham-based schools, Ambergate Sports College and Sandon School. The Federation was formed in September 2010 and caters for pupils between the ages of 3 and 19 with moderate to severe learning difficulties and complex needs. The pupils' needs are wide ranging; many are on the autistic spectrum, with others having ADHD and varying degrees of developmental delay, and some with profound and multiple learning difficulties.

Ambergate College's curricula include the formal requirements of the National Curriculum. The 14-19 Curriculum applies to Year 9 learners upwards and is designed to be flexible enough to meet highly varied individual needs. All pupils have a bespoke timetable and are offered considerable choice during the planning stage. The range of qualifications offered is targeted to include all pupils regardless of ability, ranging from lower P-levels to Level 2. The English and Mathematics qualifications shown in Table 3.1 are taught.

⁹ <http://www.ganf.org.uk/id17.html>

Table 3.1: English and Mathematics qualifications taught at Ambergate College

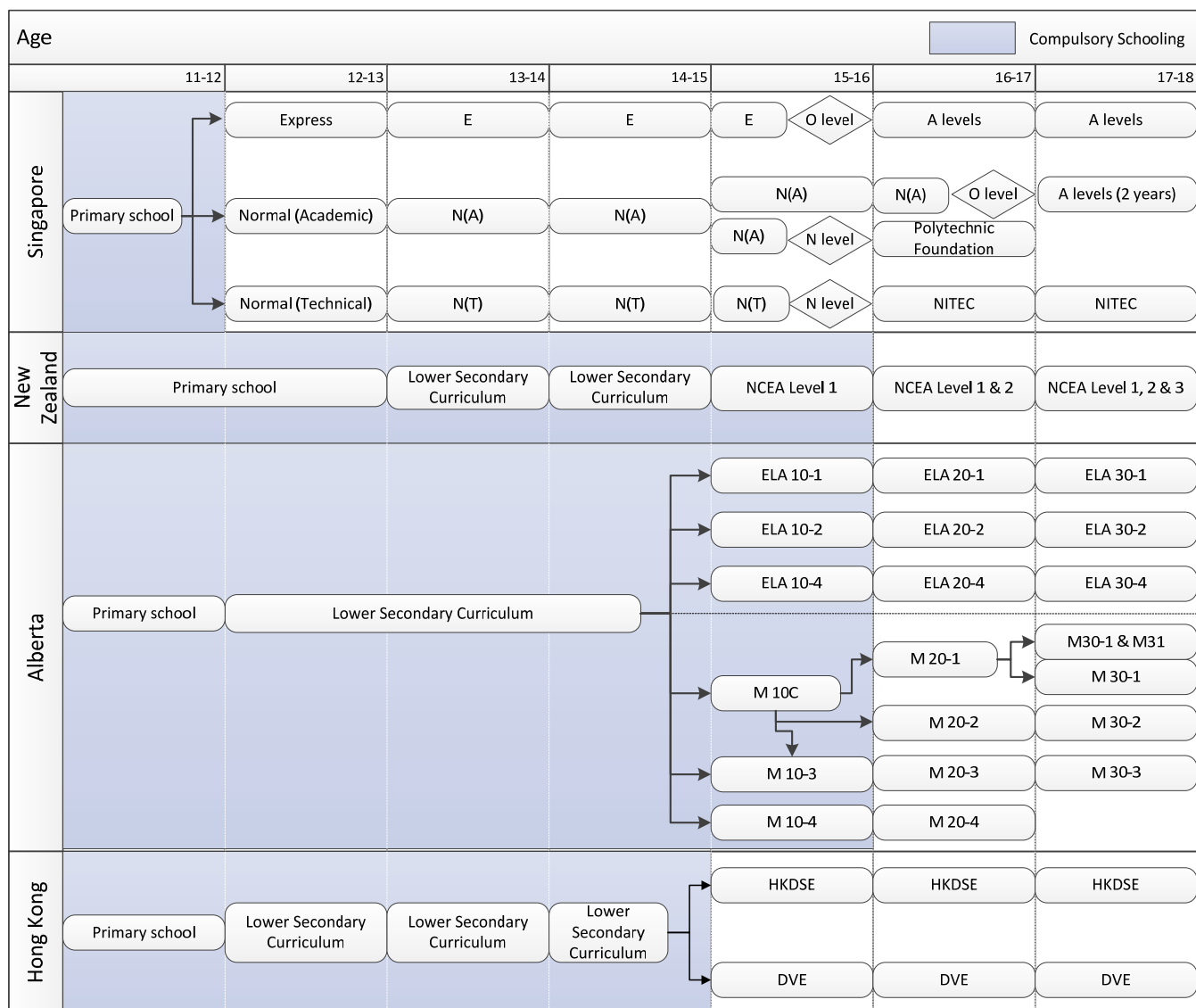
| Entry Level | Level 1 | Level 2 |
|--|--------------------------------|--------------------------------|
| Entry Level Certificate in English | GCSE English | GCSE English |
| Functional Skills English (E1, E2, E3) | Functional Skills English (L1) | Functional Skills English (L2) |
| Entry Level Certificate in Maths | GCSE Maths | GCSE Maths |
| Functional Skills Maths (E1, E2, E3) | Functional Skills Maths (L1) | Functional Skills Maths (L2) |

Literacy teaching is partnered with Phonics, PECS, Intensive Interaction and Makaton, to support development in reading, writing and communication for all pupils. For all pupils, literacy/communication is considered to be the key to learning across the curriculum, as it is a key skill in order to make choices and to make needs known. To support communication, staff work closely with speech and language therapists, the pupils and parents /carers.

4. Summary of provision in high performing jurisdictions

The main pathways through secondary education in the four high performing jurisdictions considered in this report are summarised in Table 4.1. It can be seen that in all four jurisdictions, primary education ends a year later than in England. The point at which, and the extent to which, students are offered different curricula according to their abilities, vary considerably. The pathways shown are explained in detail in subsequent sections of this report.

Table 4.1: Pathways through secondary education in four high performing jurisdictions



Further key features of the four high performing jurisdictions are summarised in Table 4.2. It can be seen that students are grouped by ability for English and Mathematics lessons in three out of four jurisdictions.

Table 4.2: Key features of secondary education in four high performing jurisdictions

| | Singapore | Alberta | Hong Kong | New Zealand |
|--|---|--|---|---|
| All students aim to get to the same level? | No | No | Yes | No |
| % repeating school years¹⁰ | 5.4% | <i>Canada: 8.4%</i> | 15.6% | 5.1% |
| Provision for less able | Different courses and qualifications. Low ability in Normal (Technical) stream [N(T)]. | Different courses and qualifications with different content and focus | Same qualifications. Low ability omit some curriculum content | Low ability move through curriculum at own rate and work on a lower level standards (units) |
| School structure | Comprehensive, with streaming within schools | Comprehensive | Unknown | Fully comprehensive |
| Typical age at which separated | 12. | 15, or sometimes earlier, e.g. 13 | Unknown | Unknown |
| Method of separation | Streamed across all subjects | Mathematics and English usually set by ability | Unknown. Assume setting within subjects | Mathematics and English usually set by ability |
| Predominant methods of teaching less able | Unknown – likely to vary across schools | Unknown – likely to vary across schools | Unknown – likely to vary across schools | Unknown – likely to vary across schools |
| Basis for separation | Primary school leaving exam results | Year 9 assessments or teacher evaluation. Weakest students may sometimes be separated after teacher evaluation at the end of Year 7. | Unknown | Unknown |
| Movement between pathways | Students transfer out of N(T) stream to the Normal (Academic) stream if they meet the criteria. | Students can move between adjacent pathways but this may entail an extra year of study | N/A | No set pathway. Students study individual standards at appropriate pace |
| English curriculum | Separate curriculum for all three pathways. N(T) students only study English Language | Three main pathways, each with own curriculum. | Same curriculum for all students. Teachers adapt curriculum for lower ability students | Curriculum split into standards at three levels. |
| Mathematics curriculum | Separate curriculum for all three pathways. | Four main pathways, each with own curriculum. | Compulsory content split into foundation and non-foundation topics. Low ability not taught (all) foundation topics. | Curriculum split into standards at three levels. |
| Qualifications at 16 (or end of secondary school if no intermediate exam) | Exams taken at approximately age 16 High ability take O levels; middle take O level and N(A) level; low ability take N(T) level. | High and middle ability take Alberta High School Diploma (age 18). Low achievers obtain Certificate of High School Achievement (Knowledge and Employability) | Exams at end of senior secondary only, age 18. All learners take same exam (HKDSE). | NCEA subjects taken at 3 different levels, depending on ability. |
| Type of assessment | External | Alberta High School Diploma: combination of external and school awarded mark. Certificate of High School Achievement: teacher assessed | Combination of external and school based assessment. | Combination of external and school based assessment. |

¹⁰ Information taken from PISA 2009 data for number of students repeating 1 or more grades.
<http://dx.doi.org/10.1787/9789264091559-en>

5. Provision in Singapore

Summary

In Singapore, students are streamed for secondary education. The lowest stream – the Normal (Technical) stream – is for those students with the lowest scores in their end of primary school tests. It has a vocational focus with a practical teaching approach that is intended to prepare students for further technical and vocational training. The curriculum is designed to ensure students are proficient in English, Mathematics and computer literacy. Students also study their mother tongue language and one or two non-compulsory subjects. After four years they sit N(T) examinations, before moving on to the Institute of Technical Education.

5.1 Introduction

Singapore is a city-state with a population of approximately five million people. The Singapore Ministry of Education (MOE) is responsible for running state controlled schools and registering independent schools. It is also responsible for developing the school curriculum.

Students in Singapore attend primary schools from the ages of 7 to 12, and attend secondary schools from the ages of 13 to 16. Only primary school education is compulsory in Singapore, but secondary education is universally available. There are a number of different pathways through education. These are shown in Figure 5.1.

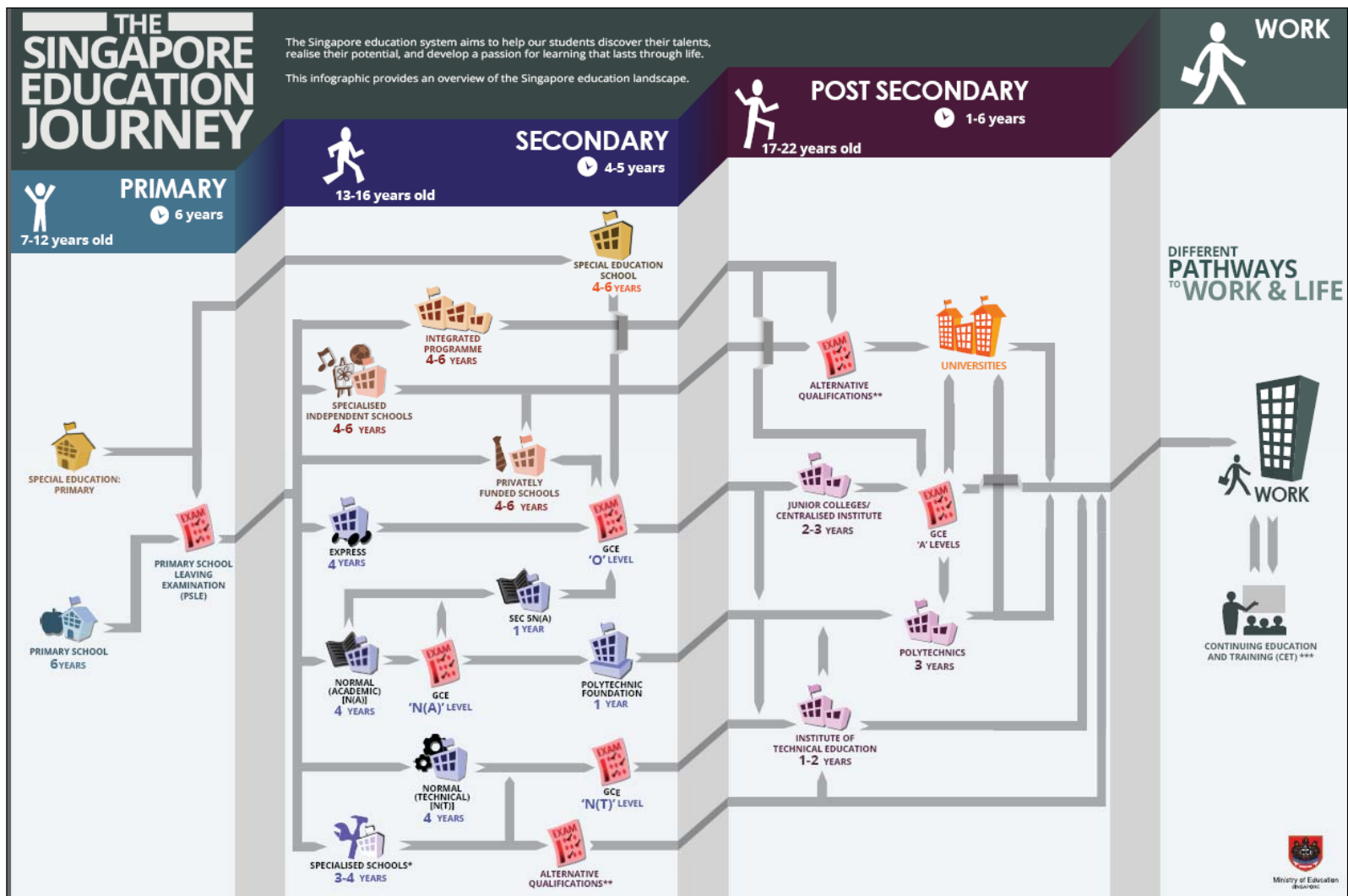


Figure 5.1: Education pathways in Singapore¹¹

¹¹ Image obtained from <http://www.moe.gov.sg/education/landscape/print/sg-education-landscape-print.pdf>

Primary schools provide a general education. At the start of their primary education, all students follow a common curriculum; however, in the last two years of primary education (Primary 5 and 6) students are split into two subject bands. Depending on the results from their school-based examinations at the end of Primary 4, students take subjects at either standard or foundation level. At the end of their last year of primary school (Primary 6) students sit the Primary School Leaving Examination (PLSE). The results of the PLSE are used to determine their stream in secondary education.

Secondary education in Singapore is divided into three streams: the Express stream, the Normal (Academic) stream and the Normal (Technical) stream. These streams are run as separate streams within individual secondary schools, although not every secondary school offers every stream. The streams were developed to solve problems with high dropout rates due to the non-compulsory nature of secondary education in Singapore. It was also thought that the different streams would allow students to progress at an appropriate rate.

Students with top PLSE scores (approximately the top 60% of the students) are eligible to enter the **Express stream**. These students either take GCE O-Level examinations after 4 years of secondary education, or follow an Integrated Programme where they miss out O-Levels and take GCE A-Levels after six years of secondary education.

Students with slightly lower scores in the PLSE (approximately the next 25% of students) are eligible to enter the **Normal (Academic)** stream. They take GCE N-Level examinations after four years. After N-levels, they can either spend an extra year in secondary school before taking O-Levels, or they can move to a Polytechnic Foundation Programme, or the Institute of Technical Education.

Students who score below 160 in the PLSE (approximately 15% of students) enter the **Normal (Technical)** stream. They take GCE 'N' level examinations after four years of secondary education, then move on to the Institute of Technical Education.

Movement between adjacent streams is possible (see Figure 5.) if students meet the transfer criteria. The government sets out academic requirements for transfer, but students and their parents must also agree to the move. Opportunities for students to transfer are limited and it is not possible to transfer in both directions in every year group. For example, Secondary 3 Express stream students can transfer to the Normal (Academic) stream, but students on the Normal (Academic) stream at the end of Secondary 3 cannot move to the Express stream.

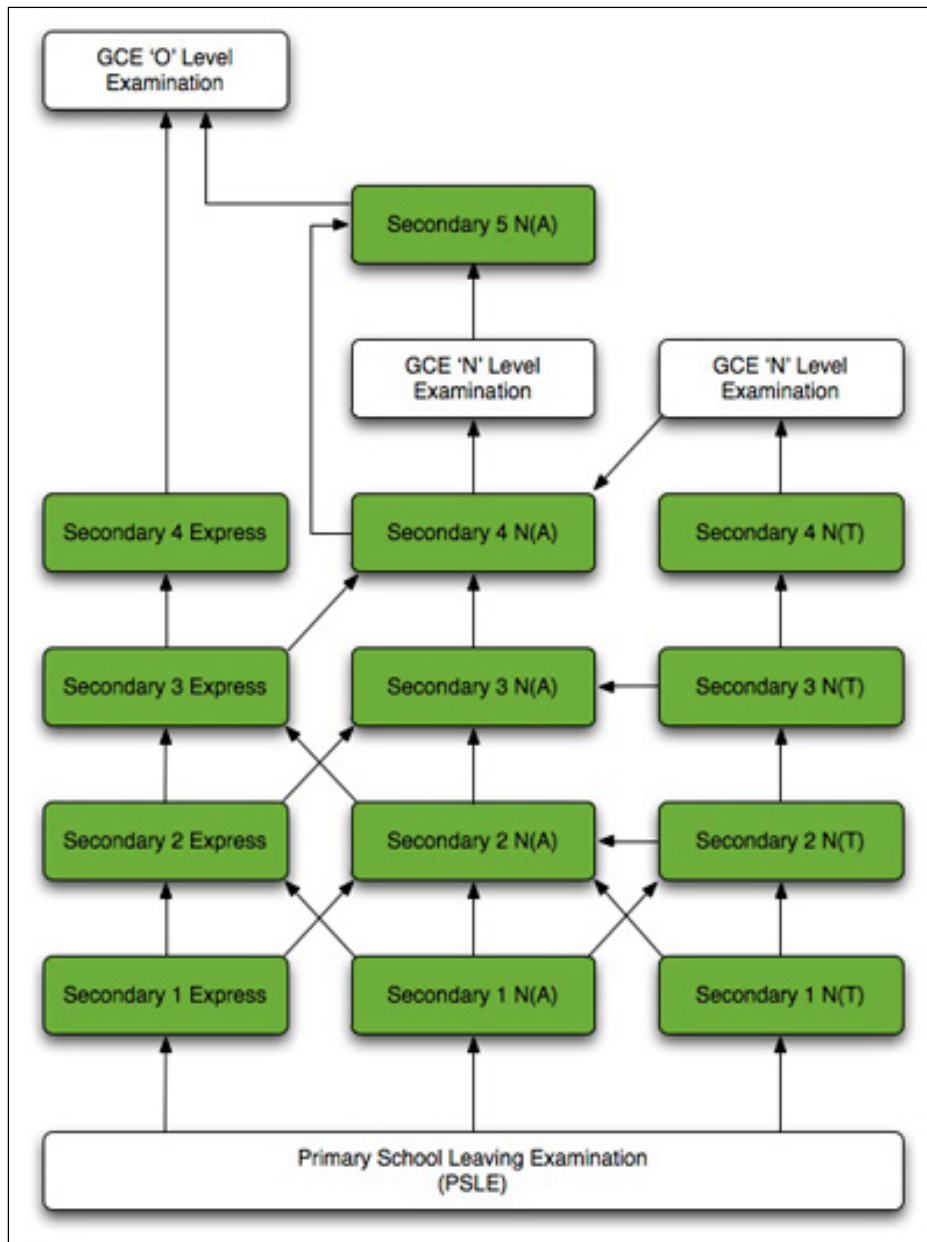


Figure 5.2: Secondary school streams and transfer routes in Singapore¹²

5.2 Normal (Technical) stream curricula

The Normal (Technical) stream has a vocational focus and a practical teaching approach that is designed to prepare students for further technical and vocational training. The MoE guidelines state that students in the Normal (Technical) stream should study six subjects, but some schools offer more. The curriculum is designed to ensure students are proficient in English, Mathematics and computer literacy. All students in the Normal (Technical) stream are required to study English Language, Mathematics, Mother Tongue and Computer Applications. A number of non-compulsory

¹²Image obtained from <http://www.moe.gov.sg/education/secondary/courses/>

subjects are available, including Science, Art, Food Studies, Mobile Robotics and Retail Operations¹³. Some schools also offer elective modules, which may be linked to external agencies and may enable students to earn credits which can be used when they move onto courses at the Institute of Technical Education.

Curricula for all subjects are available from the MoE website¹⁴. There are also examination syllabuses for the Normal (Technical) Level examinations. These are available from the Singapore Examinations and Assessment Board.

5.2.1 Normal (Technical) Mathematics Curriculum

The MoE is currently in the process of replacing the curricula for all secondary school students. The new curricula (2013 onwards) are being introduced gradually. Students starting secondary school in 2012 and earlier (those in Secondary 2 onwards) follow the previous curricula and students starting from 2013 onwards (those in Secondary 1) follow the new curricula. As the new curricula are being implemented year by year, only the Secondary 1 content is currently listed for the new curricula.

The pre-2013 curricula contain the content for all three streams in the same document. The streams share common aims, but the content is divided up into streams. In the new curricula, only the Express and Normal (Academic) curricula are combined in the same document. Sections of the curricula relating to the common goals, aims and teaching processes are common to both these streams, although the aims themselves vary slightly. The Normal (Technical) curricula are contained within a separate document.

The aims of the post-2013 Normal (Technical) Mathematics curriculum are “to enable students who are bound for post-secondary vocational education to:

- acquire mathematical concepts and skills for real life, to support learning in other subjects, and to prepare for vocational education;
- develop thinking, reasoning, communication, application and metacognitive skills through a mathematical approach to problem solving; and
- build confidence in using Mathematics and appreciate its value in making informed decisions in real life.”¹⁵

The syllabus builds upon the content from the Foundation Mathematics syllabus which students have followed in primary school. The content is divided into five strands:

- 3 content strands:
 - Number and Algebra
 - Geometry and Measurement

¹³ A full list of subjects examined at Normal (Technical) level is available on the Singapore Examinations and Assessment board website:

http://www.seab.gov.sg/nLevel/syllabus/schoolCandidates/2013_GCE_NT_ES_School.html

¹⁴ Mathematics curricula available from: <http://www.moe.gov.sg/education/syllabuses/>

¹⁵ Taken from the N(T)- Level Mathematics Teaching and Learning Syllabus:

<http://www.moe.gov.sg/education/syllabuses/sciences/files/normal-technical-level-maths-2013.pdf>

- Statistics and Probability)
- 1 context strand (Real World Context)
- 1 process strand (a list of mathematical processes that can be found in the other 4 strands).

Within the curriculum the content is arranged by strand for each year group. Learning experiences are suggested alongside the content (see Table 5.1 for an example).

Table 5.1: Extract from the Singapore Normal (Technical) Secondary 1 Mathematics curriculum¹⁶

| Level | Content | Learning Experiences |
|---|---|--|
| SECONDARY 1 | | |
| NUMBER AND ALGEBRA | | Students should have opportunities to: |
| N1. Numbers and their operations | | |
| S1 | 1.1. negative numbers and primes (exclude prime factorisation) 1.2. integers and their four operations 1.3. four operations on fractions and decimals (including negative fractions and decimals) 1.4. calculations with calculator, including squares, cubes, square roots and cube roots 1.5. representation and ordering of numbers on the number line 1.6. use of $<$, $>$, \leq , \geq 1.7. rounding off numbers to a required number of decimal places or significant figures 1.8. estimating the results of computation | (a) Discuss examples of negative numbers in the real world such as negative temperatures, places below sea-level, and time zone differences. (b) Compare big numbers up to billions and decimals in the context of money, mass and height. (c) Use algebra discs, or the AlgeDisc™ application in AlgeTools™, to make sense of addition, subtraction and multiplication involving negative integers and develop proficiency in the four operations of integers. (d) Discuss examples of fractions and decimals found in the real world such as recipes and supermarket shopping. (e) Explain the algebraic and geometric meanings of squares, cubes, square roots and cube roots, e.g. the cube root of 8 is the number whose cube is 8, and it is the edge length of a cube whose volume is 8 cubic units. (f) Relate $<$, $>$, \leq , \geq with language such as ‘less than’, ‘more than’, ‘less than or equal’, ‘more than or equal’, ‘at most’ and ‘at least’. (g) Estimate quantities (numbers and measures) to an appropriate degree of accuracy in a variety of contexts. |

5.2.2 Normal (Technical) English Curriculum

All students in the Normal (Technical) stream study English Language. There is no English Literature curriculum for Normal (Technical) stream students, although a few schools offer their own syllabuses as an elective module.

There are three aims in the English Language syllabus.

“By the end of secondary education, pupils will be able to achieve functional fluency in English as a result of their development in the following areas:

1. Listen, read and view critically and with accuracy and understanding a wide range of literary and informational/ functional texts from print and non-print sources.

In the course of listening, reading and viewing widely a range of multimodal texts and text forms, pupils will gain a better understanding of our cultural values and National Education themes, and engage in Social and Emotional Learning (SEL), where applicable.

¹⁶ Extract taken from p. 34 of the N(T)-Level Mathematics syllabus:

<http://www.moe.gov.sg/education/syllabuses/sciences/files/normal-technical-level-maths-2013.pdf>

2. **Speak, write and represent** in internationally acceptable English (Standard English) that is grammatical, fluent, mutually intelligible and appropriate for different purposes, audiences, contexts and cultures.

Pupils will speak, write and represent for creative, personal, academic and functional purposes by using language in a sustained manner (e.g., in speech and writing) and by representing their ideas in a range of multimodal texts and text forms.

3. **Understand and use internationally acceptable English (Standard English) grammar and vocabulary** accurately and appropriately as well as understand how speakers/ writers put words together and use language to communicate meaning.

Pupils will learn grammar and vocabulary in explicit, engaging and meaningful ways. They will reinforce such understanding in the course of listening to, reading, viewing, speaking, writing and representing different types of texts.

To achieve the aim of effective language use, teachers will be guided by the six Principles of EL Teaching and Learning (**CLLIPS**) and will take into account the Teaching Processes (**ACoLADE**) when developing their instructional programmes and lessons.”¹⁷

The syllabus is divided up into five areas of language learning:

- Listening and viewing
- Reading and viewing
- Speaking and representing
- Writing and representing
- Grammar
- Vocabulary

Each area of learning is divided into focus areas with associated learning outcomes. The skills, strategies, attitudes and behaviours required for each focus area are listed, and the year groups they apply to (from Primary 5 through to Secondary 4) are identified. This shows the progression in skills that are acquired. An example of a focus area is shown in Figure 5.3. Within all of the focus areas, students study the use of English in a wide range of texts, including spoken and visual texts (e.g. songs, media programmes, and online texts).

¹⁷ Extract taken from page 10 of the English Language Syllabus 2010 Primary (Foundation) & Secondary (Normal [Technical]): <http://www.moe.gov.sg/education/syllabuses/english-language-and-literature/files/english-primary-foundation-secondary-normal-technical.pdf>

ENGLISH LANGUAGE SYLLABUS 2010 PRIMARY (FOUNDATION) & SECONDARY (NORMAL [TECHNICAL])

Italics Italicised skills, learner strategies, attitudes and behaviour (SSAB) are for exposure only. Teachers will provide pupils with the experience of learning these SSAB, depending on the needs and abilities of their pupils. Italicised SSAB will not be assessed formally.

Shading indicates where an SSAB will be formally introduced and taught. Subsequently, the SSAB must be revisited, reinforced and taught at increasing levels of difficulty, until pupils have mastery of it.

This chart will be used by teachers to plan the scope and combination of SSAB to be taught at each year level, taking into account the needs and abilities of the pupils. The chart will also help teachers to decide on the areas for assessment in school.

In planning the instructional programmes and lessons, teachers will be guided by the six Principles of Language Teaching and Learning (CLLIPS) and the Teaching Processes (ACoLADe).

| READING AND VIEWING | | | FEL | | N(T) | | | | REMARKS | |
|---|--|--|-----|----|-------|-------|-------|-------|---------|--|
| FOCUS AREAS | LEARNING OUTCOMES | SKILLS, STRATEGIES, ATTITUDES AND BEHAVIOUR | P 5 | P6 | SEC 1 | SEC 2 | SEC 3 | SEC 4 | | |
| READING COMPREHENSION AND VIEWING SKILLS, STRATEGIES, ATTITUDES AND BEHAVIOUR Develop and strengthen foundation in reading and viewing skills, strategies, attitudes and behaviour... | LO2: Process and comprehend reading-age-/ year-level-appropriate texts at literal, inferential and evaluative levels (continued) | CRITICAL READING AND VIEWING | | | | | | | | |
| | | <ul style="list-style-type: none"> • Make connections between a text and personal experiences, real life | | | | | | | | |
| | | <ul style="list-style-type: none"> • Respond to the text read (e.g., with reasons, simple judgement, simple arguments) | | | | | | | | |
| | | <ul style="list-style-type: none"> • Identify the purpose and audience for a given text | | | | | | | | |
| | | <ul style="list-style-type: none"> • Draw simple conclusions (e.g., from examples, evidence and reasons from the text) | | | | | | | | |
| | | <ul style="list-style-type: none"> • Identify points of view in the text | | | | | | | | |
| | | <ul style="list-style-type: none"> • Use a variety of criteria to evaluate information sources (e.g., information from websites, visual texts) | | | | | | | | |
| | | <ul style="list-style-type: none"> • Identify problem-solution in a text (e.g., by linking an issue to its problem source) | | | | | | | | |
| | | <ul style="list-style-type: none"> • Evaluate given information (e.g., for order of importance, relevance, bias, stereotypes from print and non-print texts) | | | | | | | | |
| | | <ul style="list-style-type: none"> • Demonstrate understanding of how language choice is used to enhance written and visual texts (e.g., use of emotive words in commercials or advertisements) | | | | | | | | |
| <ul style="list-style-type: none"> • <i>Identify and analyse techniques used in written and visual texts (e.g., music/ sound effects, visuals, use of language) to achieve a variety of purposes</i> | | | | | | | | | | |

Figure 5.3: Extract from the Singapore Normal (Technical) English Language curriculum¹⁸

¹⁸Extract taken from page 36 of the English Language Syllabus 2010 Primary (Foundation) & Secondary (Normal [Technical]): <http://www.moe.gov.sg/education/syllabuses/english-language-and-literature/files/english-primary-foundation-secondary-normal-technical.pdf>

5.3 Teaching groups

There is no official guidance about how students should be grouped in the Normal (Technical) stream.

5.4 Normal (Technical) stream assessments

At the end of the Secondary 4 year, Normal (Technical) stream students sit N(T)-Level examinations. Most subjects are jointly examined by the MoE, and Cambridge International Examinations. Assessments for some applied subjects are developed by the Institute of Technical Education and have been approved by the MoE, but individual schools have to be approved before they can offer these subjects.

Students are assessed by written exams and practical exams. In Languages (both English and Mother Tongue) students are also assessed by oral examinations and listening comprehensions. There are five grades: grades A to D (considered to be a pass) and Ungraded. The Normal (Technical) Level Certificate is awarded to all candidates who achieve a pass in one or more subjects. In 2012 it was awarded to 98.1% of the Normal (Technical) students.

5.4.1. Mathematics assessments

Students are assessed by two written papers, each lasting 1 hour and 30 minutes. Each paper assesses slightly different areas of content. Geometry and Measurement is only assessed on Paper 1, whilst statistics and probability is only assessed on Paper 2. Calculators are allowed for both papers and a relevant formulae sheet is given for both papers.

5.4.2 English assessments

English language is assessed through four written papers. The focus, duration and weighting of each paper are shown in Table 5.2.

Table 5.2: Content of English Language N(T) papers

| Paper | Description | Marks | Weighting (%) | Duration |
|-------|---|-------|---------------|--------------------|
| 1 | Writing Section A: Form filling and functional writing Section B: Guided writing | 60 | 30 | 1 hour 15 min. |
| 2 | Language use and comprehension Section A: Language use (editing, completing spoken transcript, cloze) Section B: Reading comprehension | 80 | 40 | 1 hour 20 min. |
| 3 | Listening | 20 | 10 | Approx. 45 min. |
| 4 | Oral Communication Reading aloud and spoken interaction | 40 | 20 | Approx. 20 min. |

5.5 Transfer out of Normal (Technical) stream

Movement out of the Normal (Technical) stream is limited. On average, about 6% of the N(T) stream progress to the N(A) stream at the end of Secondary 1. Most students transfer between streams early on in their secondary education, although about 5 students every year transfer from N(T) to N(A) for Secondary 4.

5.6 Progression

After completing their Normal (Technical) course, students are expected to progress to the Institute of Technical Education (ITE). ITE offers technical education and courses to train students for particular careers. Students study for a National ITE certificate (Nitec). The entry requirements depend upon the course that is being followed. Most Nitec courses require a minimum of 3 N level passes at grades A-D and passes in particular subjects are often specified¹⁹. After studying at ITE, most students move on to internships or jobs. Students who have a good grade point average can apply for places on a Higher Nitec course in a subject area related to their Nitec course.

Normal (Technical) students who have obtained a grade A for both English Language and Mathematics and a grade B in one other Normal (Technical) level subject are eligible for transfer into the Secondary 4 Normal (Academic) stream.

5.7 Research literature

There appears to be little research relating to the Normal (Technical) stream. Whilst it is often referred to in descriptions of the secondary education system in Singapore, only a few research studies have investigated it in any detail. The following issues for students in the Normal (Technical) stream and their teachers have been identified from the more detailed research studies.

- Students in the Normal (Technical) stream are considered to be difficult to teach. Classroom management problems are exacerbated by students' low literacy levels. As a result, teachers often resort to knowledge transmission, only requiring students to copy information or fill-in-the-blanks (Ismail & Ling, 2004).
- Teachers expect Normal (Technical) students to do poorly academically (Ho, 2012)
- The reduced curriculum content in comparison to the other streams means that teachers do not always stretch their students. (Ong, 2008).
- Students can be stigmatised as a result of being placed in the Normal (Technical) stream and this can lead to low self-esteem. (Ong, 2008; Ho, 2012).

¹⁹ Details of the Nitec courses and minimum entry requirements are available on pages 18-19 of the prospectus:

http://www.ite.edu.sg/pv_obj_cache/pv_obj_id_22F4C65AC116CB902A3923A45943C7F9B9B61200

- It is not easy to transfer between the streams as the gap in curriculum content between the Normal (Technical) stream and the Normal (Academic) stream is too great (Ong, 2008).
- There is less equity in learning opportunities than in many other countries around the world. Singapore PISA reading scores are highly dependent on socio economic status, and the range of PISA reading scores is higher than the international average (Ng, 2013).
- There is limited intergenerational mobility (Ng, 2013).
- There is a high dropout rate from secondary education (20%), with 90% of drop-outs occurring in the Normal (Technical) stream (Ho, 2012).

5.8 References

Ho, P. S. K (2012) 'I have won a world championship and now I can retire': Exploring normal technical students' ways of unpacking academic expectations in Singapore, *International Journal of Educational Development*, 32(1) Pages 111-119, (<http://www.sciencedirect.com/science/article/pii/S0738059310001768>)

Ismail, M. and Tan, A. L. (2005) Voices from the Normal Technical World – An ethnographic study of low-track students in Singapore. In *Redesigning pedagogy: research, policy, practice conference*, Singapore, May - June 2005. Singapore: National Institute of Education Digital Repository.

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Ong, C. H. (2008) *Principals' Management of Lowest Stream (Normal Technical) Students in Singapore Secondary Schools*. Ph. D. University of Leicester. <http://hdl.handle.net/2381/9621>

6. Provision in New Zealand

Summary

In New Zealand, all students follow the same curricula. There is no streaming. Students in Years 11 to 13 study for National Certificates of Educational Achievement (NCEA) at Levels 1, 2 and 3. A Level 3 certificate enables students to progress to university education. As the curriculum content and the NCEA levels are not tied to particular school years, students can take more than one year to complete a level. The lowest performing students may take two or three years to achieve their NCEA. Students earn credits towards their NCEA by studying standards (individual units for a subject). To achieve an NCEA they must achieve 80 credits. For the Level 1 NCEA, their credits must include ten numeracy credits and ten literacy credits. Students can also work towards National Certificates, using transferable credit from the NCEA.

6.1 Introduction

New Zealand is an island country with a population of approximately 4.5 million people. The Ministry of Education (MOE) oversees the whole education system. It develops the curriculum and the national assessment standards. The New Zealand Qualifications Authority (NZQA) is responsible for: managing the New Zealand Qualifications Framework, administering the secondary school assessment system, recognising qualifications and setting the standards for some unit standards.

Education in New Zealand is compulsory from the ages of 6 to 16. Primary education runs from the ages of 5 to 13 (Years 1 to 8) and secondary education from 13 to 18 (Years 9 to 13). There are many different types of schools in New Zealand (see Figure 6.1). The main differences between them are in the age ranges they cater for, whether they are state or independent schools, and whether they are a Māori school. Schools generally accept students of all abilities, and tend not to stream students or require them to repeat years.

| | | | | | | | | | | | | |
|-----------------------------|---------------|---------------------|----------------------|----------------------|-------------------------|--------------------------------|-----------------|-----------------------|----------------------|----------------------|--------------------|----|
| Schools & Year of Schooling | Year 13 | Year 7 - 13 Schools | Year 9 - 13 Schools | | Composite/ Area schools | Wharekura | Special Schools | Correspondence School | 17 | COMPLUSORY SCHOOLING | | |
| | Year 12 | | Contributing Schools | Intermediate Schools | | | | | Full Primary Schools | | Kura Kaupapa Māori | 16 |
| | Year 11 | | | | | | | | | | | 15 |
| | Year 10 | | | 14 | | | | | | | | |
| | Year 9 | | | 13 | | | | | | | | |
| | Year 8 | | | 12 | | | | | | | | |
| | Year 7 | 11 | | | | | | | | | | |
| | Year 6 | 10 | | | | | | | | | | |
| | Year 5 | 9 | | | | | | | | | | |
| | Year 4 | 8 | | | | | | | | | | |
| | Year 3 | 7 | | | | | | | | | | |
| | Year 2 | 6 | | | | | | | | | | |
| | Year 1 | 5 | | | | | | | | | | |
| Early Childhood Education | Kindergartens | Playcentres | Childcare | Childcare Home based | Te Kōhanga Reo | Pacific Island Language Groups | Playgroups | 4 | Age | | | |
| | | | | | | | | 3 | | | | |
| | 2 | | | | | | | | | | | |
| | 1 | | | | | | | | | | | |

Figure 6.1: School types in New Zealand²⁰

6.2 Curricula

The New Zealand National Curriculum is followed by all students in New Zealand from Year 1 to Year 13. The content is shown by subject and within each subject the content is divided into eight levels. Each level covers several year groups, and each year group is expected to be working at two (or more) levels. The coverage of levels by year group is shown in Figure 6.. Students must study English, the Arts, Health and Physical Education, Mathematics and Statistics, Science, the Social Sciences, and Technology until the end of Year 10.

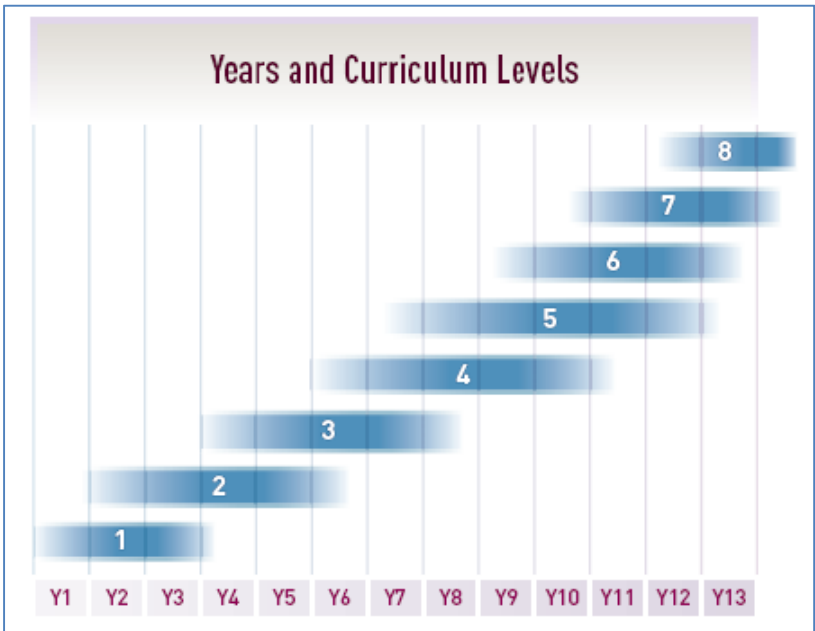


Figure 6.2: Alignment of curriculum levels with school year groups²¹

²⁰ Image obtained from: <http://www.minedu.govt.nz/Parents/AllAges/EducationInNZ/SchoolsInNewZealand/YearLevels.aspx>

²¹ Image obtained from: <http://nzcurriculum.tki.org.nz/content/download/1110/11995/file/Charts1.pdf>

6.3 Assessment - NCEA

From Year 11 to Year 13, students work towards National Certificates of Educational Achievement (NCEAs). These certificates were designed to “recognise and credential the learning success of *all* students, whatever their traditional academic prowess.”²² The NCEAs are available at three levels: Level 1, Level 2 and Level 3. Students are expected to achieve a Level 1 certificate in Year 11, Level 2 in Year 12 and Level 3 in Year 13. However, the content is not tied to particular academic years. At each level, students are able to study some content at the level below. Students can also take more than a year to cover the content, which means that low performers are able to take more than one year to complete each level of their NCEAs. The proportion of students aged 16 in 2009 and completing their NCEA Level 1 in each academic year is shown in Table 6..

Table 6.1: Academic year in which students completed their Level 1 NCEA²³

| | 2009 (Year 11) | 2010 (Year 12) | 2011 (Year 13) |
|---------------|----------------|----------------|----------------|
| Male | 62.9% | 14.2% | 1.5% |
| Female | 71.1% | 11.5% | 1.1% |

The NCEA subjects are divided into many individual standards, each of which targets a specific skill and is aligned to one of the three levels. Students are able to study a subject at more than one level, for example taking history ‘standards’ (units) at Level 1 and Level 2 during the same school year. Each standard is worth a certain number of credits, with each credit worth approximately ten hours of study. Generally, courses that students follow are worth 18 to 24 credits, although some courses only contain 12 credits and others contain more than 30. To achieve an NCEA certificate, students have to achieve 80 or more credits, of which at least 60 have to be of that level or above. In addition, for the Level 1 NCEA students must achieve ten of these credits for Level 1 numeracy and ten for Level 1 literacy. The standards containing the literacy and numeracy requirements occur in a range of subjects, not just English and Mathematics and Statistics.

There are two types of standards: achievement standards and unit standards. Unit standards are based on competency and are usually graded A (achieved) or N (not achieved). Achievement standards are based on the New Zealand curriculum and are graded A (achieved), M (merit), E (excellence) or N (not achieved). Standards with content that cannot be tested in an exam (e.g. research projects or speaking) are assessed internally; other standards are assessed externally, usually at the end of the school year. All unit standards are assessed internally through the accumulation of evidence. Some of the achievement standards are assessed internally, others are assessed externally.

²² Taken from P19 of the 10 year review of the NCEA (http://www.nzcer.org.nz/system/files/NCEA%20Decade%20On%20Final_web%20%281%29.pdf)

²³ Adapted from NCEA annual report 2011 (p28) (<http://www.nzqa.govt.nz/assets/About-us/Publications/stats-reports/ncea-annualreport-2011.pdf>)

6.3.1 English Standards (Level 1)

There are eleven unit standards and eleven achievement standards at Level 1. Each standard is worth between two credits and five credits. A list of the standards is shown in Table 6..

Table 6.2: List of English standards at Level 1²⁴

| Type of standard | Title of standard | No. of credits | Assessment |
|--------------------|--|----------------|------------|
| Unit | Express ideas in writing and write an original story | 4 | Internal |
| | Make inquiries and complete practical transactions | 4 | Internal |
| | Be interviewed in an informal one-to-one, face-to-face interview | 2 | Internal |
| | Independently read texts about life experiences which relate to a personal identified interest | 3 | Internal |
| | Fill in a form | 2 | Internal |
| | Complete an incident report | 2 | Internal |
| | Demonstrate knowledge of and apply listening techniques | 3 | Internal |
| | Participate and communicate in a team or group to complete a routine task | 2 | Internal |
| | Demonstrate knowledge of workplace communications requirements | 5 | Internal |
| | Converse with others | 2 | Internal |
| | Write formal personal correspondence | 3 | Internal |
| Achievement | Produce creative writing | 3 | Internal |
| | Produce formal writing | 3 | Internal |
| | Show understanding of specified aspect(s) of studied written text(s), using supporting evidence | 4 | External |
| | Show understanding of specified aspect(s) of studied visual or oral text(s), using supporting evidence | 4 | External |
| | Show understanding of significant aspects of unfamiliar written text(s) through close reading, using supporting evidence | 4 | External |

²⁴ List of current English standards taken from <http://www.nzqa.govt.nz/ncea/assessment/search.do?query=English&view=all&level=01>

| Type of standard | Title of standard | No. of credits | Assessment |
|------------------|--|----------------|------------|
| | Explain significant connection(s) across texts, using supporting evidence | 4 | Internal |
| | Use information literacy skills to form conclusion(s) | 4 | Internal |
| | Form personal responses to independently read texts, supported by evidence | 4 | Internal |
| | Create a visual text | 3 | Internal |
| | Show understanding of visual and/or oral text(s) through close viewing and/or listening, using supporting evidence | 3 | Internal |
| | Construct and deliver an oral text | 3 | Internal |

6.3.2 Mathematics and statistics standards (Level 1)

There are three unit standards and thirteen achievement standards at Level 1. Each standard is worth between one credit and four credits. A list of the standards is shown in Table 6..

Table 6.3: List of Mathematics standards at Level 1²⁵

| Type of standard | Title of standard | No. of credits | Assessment |
|--------------------|---|----------------|------------|
| Unit | Use formulae and equations to solve problems in the workplace | 1 | Internal |
| | Use Pythagoras' theorem and trigonometry to solve problems related to right-angled triangles in the workplace | 1 | Internal |
| | Use a strategy to estimate the solutions to number problems and make estimates of measurements in the workplace | 2 | Internal |
| Achievement | Apply numeric reasoning in solving problems | 4 | Internal |
| | Apply algebraic procedures in solving problems | 4 | External |
| | Investigate relationships between tables, equations and graphs | 4 | External |
| | Apply linear algebra in solving problems | 3 | Internal |
| | Apply measurement in solving problems | 3 | Internal |

²⁵ List of current Mathematics and statistics standards taken from <http://www.nzqa.govt.nz/ncea/assessment/search.do?query=Mathematics&view=all&level=01>

| Type of standard | Title of standard | No. of credits | Assessment |
|------------------|---|----------------|------------|
| | Apply geometric reasoning in solving problems | 4 | External |
| | Apply right-angled triangles in solving measurement problems | 3 | Internal |
| | Apply knowledge of geometric representations in solving problems | 3 | Internal |
| | Apply transformation geometry in solving problems | 2 | Internal |
| | Investigate a given multivariate data set using the statistical enquiry cycle | 4 | Internal |
| | Investigate bivariate numerical data using the statistical enquiry cycle | 3 | Internal |
| | Demonstrate understanding of chance and data | 4 | External |
| | Investigate a situation involving elements of chance | 3 | Internal |

6.3.3 Literacy standards

The New Zealand Qualifications Authority defines literacy as follows:

“Literacy is the written and oral language people use in their everyday life and work. It includes reading, writing, speaking, and listening. Skills in this area are essential for good communication, active participation, critical thinking and problem solving.”²⁶

Students can meet the Level 1 literacy requirements through two routes. Either they can take specified achievement standards in a range of subjects that meet the literacy requirement, or they can take three literacy unit standards.

There are 155 achievement standards that meet the literacy requirement as they require students to use reading, writing, speaking and listening skills within the assessment(s). They occur in a wide range of subjects (e.g. accounting, English, processing technologies).

The three literacy unit standards are: write to communicate ideas for a purpose and audience; actively participate in spoken interactions; read texts with understanding. Each standard is assessed on the basis of a portfolio of work produced in other standards (not necessarily English), not by producing work purely to satisfy the literacy standards. Students must complete all three units to fulfil the literacy requirement.

²⁶ <http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/subjects/literacy-and-numeracy/literacy-and-numeracy-unit-standards/background-to-literacy-and-numeracy-standards/>

6.3.4 Numeracy Standards

The New Zealand Qualifications Authority defines numeracy as follows:

“Numeracy is the bridge between mathematics and daily life. It includes the knowledge and skills needed to apply mathematics to everyday family and financial matters, learning, work and community tasks, social and leisure activities.”²⁷

Students can meet the numeracy requirements through two routes. Either they can take specified achievement standards in a range of subjects that meet the numeracy requirement, or they can take three numeracy unit standards.

There are 29 achievement standards that meet the numeracy requirements as students are required to use number, measurement and statistical skills within the assessment(s). They occur in a limited range of subjects (e.g. Physics, Mathematics and Statistics).

The three numeracy unit standards are: use number to solve problems; use measurement to solve problems; interpret statistical information for a purpose. Each standard is assessed on the basis of a portfolio of work produced in other standards (not necessarily Mathematics and Statistics), not by producing work purely to satisfy the numeracy standards. Students must pass all three units to fulfil the numeracy standards.

6.4 Assessment – other qualifications

Students in New Zealand can also take National Certificates. These qualifications are available in a range of school-related areas and are intended to prepare students for further learning or for a related line of employment. Many of the National Certificates are available in subjects related to particular professions (e.g. the National Certificate in Hospitality, the National Certificate in Building, Construction, and Allied Trades Skills)²⁸ and most of these are only available at Levels 2 and 3; however, there are also National Certificates in Mathematics available at Levels 1 and 2. No National Certificate exists specifically for English or Literacy, but literacy skills are covered within some of the National Certificates (e.g. the National Certificate in Employment Skills).

Students automatically receive a National Certificate when they have studied the appropriate number of credits from the unit standards or achievement standards. The same credits can also be used for the NCEA.

Approximately 121,000 National Certificates were awarded in 2011. Over half of them were awarded to students in Year 13. The most commonly awarded certificates were in Mathematics and Science, and accounted for almost half of the certificates awarded. It is not clear whether the students achieving these certificates were low performers.

²⁷ <http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/subjects/literacy-and-numeracy/literacy-and-numeracy-unit-standards/background-to-literacy-and-numeracy-standards/>

²⁸ For a complete list of certificates, see: <http://www.nzqa.govt.nz/qualifications-standards/qualifications/other-school-qualifications/list/>

6.4.1 National Certificate in Mathematics (Level 1)

The National Certificates in Mathematics are the most commonly awarded certificates. In 2011, approximately 80,000 students were awarded the certificate at Level 1 or Level 2. The Level 1 certificate requires students to complete a minimum of 40 credits at Level 1 or above. Thirty of the credits must be gained from either Mathematics or Probability and Statistics standards, and a maximum of five credits should come from Personal and Financial Management standards. No specific standards are specified for students taking this qualification. The introduction to the National Certificate in Mathematics lists the skills that students will gain through taking the course.

“At Level 1, candidates should be able to gain competency in mathematical skills which may lead to further study in mathematics or prepare candidates for work where maths skills are required. They will be able to:

- *perform simple mathematical operations;*
- *use mathematical skills;*
- *use a problem-solving approach to mathematical problems or tasks.*

And, depending on standard selection, they may be able to:

- *perform income-related calculations;*
- *demonstrate knowledge of personal financial management;*
- *interpret and verify accuracy of personal financial documents.”²⁹*

6.5 Teaching groups

Students in New Zealand are not streamed, although they may be set within their schools. In the upper secondary (Years 11-13), students all follow the same curricula, completing standards from the NCEA. As NCEA standards can be taken in any year and the results can be carried forward, so lower performing students can keep working on Level 1 standards until they achieve that level. Students can also work on vocational qualifications within school. Those students choosing to do so are not placed in a separate vocational stream.

6.6 Progression

Within schools, students are expected to progress between the levels of the NCEA. Upon completing the Level 3 NCEA, students who meet the entrance requirements can progress to university education. Students completing the NCEA at any of the three levels may progress to employment or tertiary education.

Students completing the National Certificate in Mathematics at Level 1 can transfer to the National Certificate in Mathematics at Level 2. They may also continue in other forms of education, or enter employment.

²⁹ Source: <http://www.nzqa.govt.nz/nzqf/search/viewQualification.do?qual=1079>

7. Provision in Alberta, Canada

Summary

Students in Alberta attend a senior high school from Year 10 to Year 12. For core subjects such as English and Mathematics, there are different pathways for students with different abilities and career goals. Students can switch between pathways, sometimes moving 'sideways' and taking extra time at particular 'levels'. The system thereby acknowledges that students learn at different paces. Courses for the least academic students ('knowledge and employability' courses) have a functional and vocational flavour. There is no attempt to get all students to the same point of learning by the end of high school.

7.1 Introduction to education in Alberta

The province of Alberta in western Canada is approximately 2.5 times the size of the UK but has a population of only 3.7 million people. Alberta's Ministry for Education (known as 'Alberta Education'³⁰) is responsible for:

- developing curricula and setting standards
- evaluating the curriculum and assessing outcomes
- teacher development and certification
- supporting students with special educational needs
- funding and supporting school boards
- providing aboriginal and francophone education
- managing the Alberta Initiative for School Improvement
- overseeing basic education policy and regulations.

Typically, students in Alberta attend a junior high school from Year 7 until the end of Year 9.³¹ At the end of Year 9, they sit provincial achievement tests in 'English Language Arts', Mathematics, Science and Social Studies.³² The tests provide information about students' achievements and facilitate comparisons across the province. Teachers use the test results to reflect on and improve their teaching, as well as to report levels of achievement to students and parents.

Subsequently, most students transfer to a senior high school for Years 10, 11 and 12, before proceeding to higher education, further education, apprenticeships or employment. Of these final three school years, Year 11 is often considered the most stable and productive year for students.

³⁰ Ministry website: <http://www.education.alberta.ca/department/about.aspx>

³¹ Some middle or junior schools cover Year 5 to Year 9, and some schools in remote areas cover wider age ranges.

³² Alberta Education tests all children in the province in the core subjects in Grade 3, 6, and 9. From 2014, the provincial achievement tests will be replaced (over the course of several years) with computer-based diagnostic tests called Student Learning Assessments, which are in development. The new tests will be taken at the start of Grades 4, 7, and 10. See: <http://www.globalpost.com/dispatch/news/the-canadian-press/130511/alberta-overhaul-benchmarks-tests-grade-schools-starting-nex>

This is because in Year 10 they are finding their feet, and in Year 12 they have the stress and excitement of graduating (attending various festivities), and of applying to university and for other educational or employment opportunities.

At senior high schools, many courses have a '10–20–30' structure. This means that many students complete the '10' course in Year 10, the '20' course in Year 11, and the '30' course in Year 12. For particular subjects, including English Language Arts and Mathematics (described in detail below), alternative courses with differing content and difficulty are available to students. The course that a student follows will depend upon career and educational aspirations, achievements in the Year 9 provincial achievement tests, and teacher advice. The start of Year 10 is therefore a key point of divergence into different educational pathways.

7.2 Senior high school assessment

A credit-system is in operation: 1 credit is allocated for every 25 hours of instruction that a course entails. Academically able students must earn 100 credits in order to graduate from high school with the *Alberta High School Diploma* at the end of Year 12. Assessment for the diploma is 50% classroom-based and 50% examination-based. Less academic and more vocationally-minded students aim to complete 80 credits to achieve a *Certificate of High School Achievement (Knowledge and Employability)* instead of the diploma. The *Certificate of School Completion in Special Education* can be awarded to students with significant cognitive disabilities, many of whom have followed an 'individualized program plan'.

7.3 Knowledge and employability courses

The Albertan education system does not aim to get all students to the same point of learning by the time they leave high school. Instead, a key feature of Alberta's education system is its 'knowledge and employability' courses, which are available in English, Mathematics, Science, Social Studies, and Occupations courses from Year 8 to Year 12 inclusive. These courses offer an important educational pathway for less academically able students, but are not designed for students with special education needs. They are:

"...intended to provide students with opportunities to experience success and become well prepared for employment, further studies, active citizenship and lifelong learning.

Knowledge and Employability courses include and promote:

- workplace standards for academic, occupational and employability skills
- practical applications through on- and off-campus experiences and/or community partnerships
- career development skills for exploring careers, assessing career skills and developing a career-focused portfolio
- interpersonal skills to ensure respect, support and cooperation with others at home, in the community and at the workplace."

(Knowledge and employability courses handbook: grades 8-12, 2009, p. 3³³)

Enrolment in one or more knowledge and employability courses is determined individually on a course-by-course basis. The decision is based on each student's achievements and goals, and how those goals relate to the philosophy, rationale and intent of the courses. Time and credit allocations for Knowledge and Employability courses are consistent with other senior high school courses (e.g. 5 credits for 125 hours of instruction).

7.4 Pathways in English

In Alberta, the subjects of English Language and English Literature are taught through 'English Language Arts' (ELA) courses.³⁴ ELA students follow one of three main pathways (Figure 7.1).

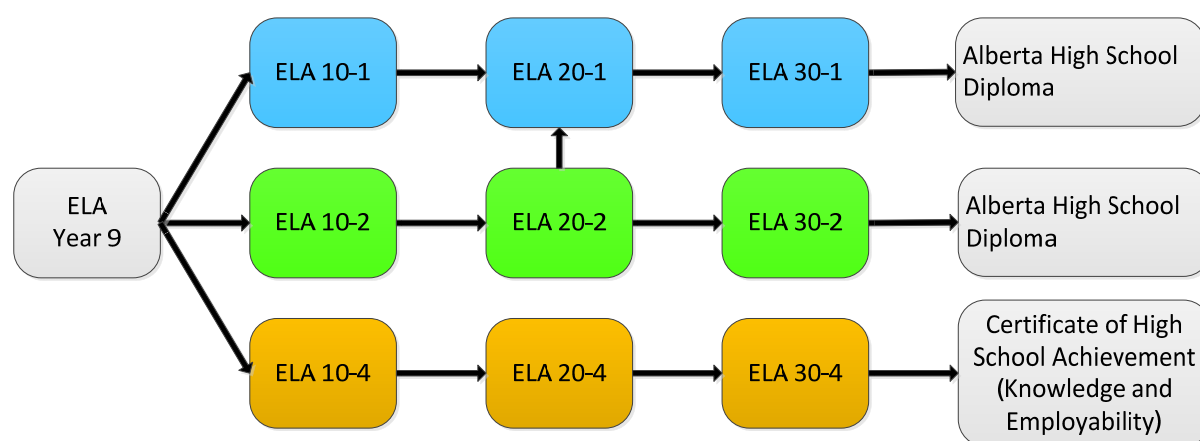


Figure 7.1: Pathways in English in Alberta

As shown in Figure 7.1, it is possible to transfer from the '2' pathway to the '1' pathway, usually by spending an extra year studying ELA. The official guidance explains:

"For students who require ELA 30-1 to enter a post-secondary program and are registered in the ELA 10-2, 20-2, 30-2 course sequence, the preferred transfer point to the other course sequence is at the 20-level, depending on the student's ability. Students who meet the requirements may decide to take ELA 20-2, transfer to the other course sequence and take ELA 20-1, and then take ELA 30-1. Students generally experience more success following this pathway."

(English Language Arts (Senior High), 2003, p. 7³⁵)

The three pathways are targeted at different groups of students and have different progression opportunities (Table 7.1).

³³ Available at: http://www.education.alberta.ca/media/524889/ke_handbook.pdf

³⁴ The main website for English courses in Alberta is: <http://www.education.alberta.ca/teachers/program/english.aspx>

³⁵ Available at: <http://www.education.alberta.ca/media/645805/srhelpapofs.pdf>

Table 7.1: Key features of English pathways in Alberta

| Pathway | Target group | Key features of curriculum | Assessment | Progression |
|--|---|---|---|--|
| English -1 (shown in blue) | The most able students | <ul style="list-style-type: none"> - Students <i>analyse & respond</i> to literature. - Texts can relate to cultural & societal issues. - Students create their own texts, including persuasive writing. | Final mark in ELA 30-1 is the average of the school-awarded mark & the diploma examination mark ³⁶ | Post-secondary education & careers requiring strong reading & communication skills |
| English -2 (shown in green) | Students with diverse abilities and goals | <ul style="list-style-type: none"> - Students <i>study</i> literature. - Material often has daily life or practical applications. - Students are encouraged to create their own texts. | Final mark in ELA 30-2 is the average of the school-awarded mark & the diploma examination mark | Range of post-secondary education or other opportunities, & careers requiring basic reading and communication skills |
| Knowledge and employability English (shown in orange) | Students who have experienced challenges or difficulty with their skills in ELA & have a history of low achievement. E.g. They have a grade level achievement 2–3 years below their peers, but not below a Grade 4 level. | <ul style="list-style-type: none"> - Students are shown additional strategies for success. - Materials have practical applications & support development of reading comprehension, communication, & other occupational skills. - Students create their own <i>brief</i> texts. | Teacher assessment ³⁷ | Employment, further training/courses, or other opportunities not requiring post-secondary education |

Outlines of the curricula for each of the three pathways are given at:

http://www.learnalberta.ca/content/mychildlearning/gradeataglace/hs_ela.pdf

Full details of all aspects of ELA courses are given at:

<http://www.education.alberta.ca/media/645805/srhelapofs.pdf>

Approaches to grouping ELA students for teaching purposes vary. While some schools offer separate ELA courses at each grade level, others offer a blended ELA course at each grade level and

³⁶ Diploma examination results from 2007/8 to 2011/12 are available at:

<http://education.alberta.ca/admin/testing/diploma-results.aspx> Students tend to get higher school awarded marks than examination marks.

³⁷ An example of assessment guidance for knowledge and employability teachers is available at:

http://www.learnalberta.ca/content/kes/pdf/or_ws_tea_03_assess.pdf

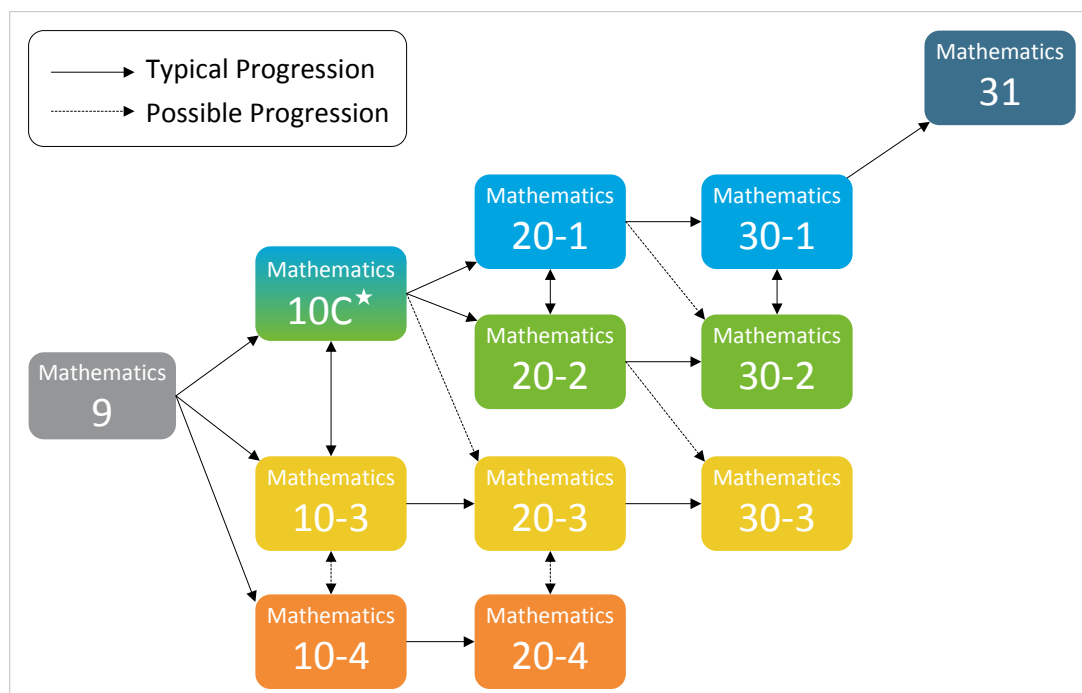
differentiate teaching within the blended classroom. Where grouping occurs, students are grouped either by past achievement according to Grade 9 ELA results, or by teacher evaluation according to Grade 10 results in the first two weeks of senior high school.

7.5 Pathways in Mathematics

Alberta has recently revised its Mathematics courses.³⁸ Its programmes of study are based on the Common Curriculum Framework (CCF) under the Western Northern Canadian Protocol. The main goals of its Mathematics education are to prepare students to:

- solve problems
- communicate and reason mathematically
- make connections between Mathematics and its applications
- become mathematically literate
- appreciate and value Mathematics
- make informed decisions as contributors to society.

Mathematics students follow one of four pathways (Figure 7.2):



*Students must pass Grade 9 Mathematics to enrol in Mathematics 10C.

Figure 7.2: Pathways in Mathematics in Alberta³⁹

³⁸ The main website for Mathematics courses in Alberta is:

<http://www.education.alberta.ca/teachers/program/math.aspx>

³⁹ Image obtained from: <http://www.education.alberta.ca/media/6744299/fsoption.pdf>

As shown in the above diagram, there are lots of possibilities to transfer between the pathways. Sometimes this will entail a student spending extra time at a particular level (10, 20, or 30) and learning at a slower pace overall. Mathematics-2 in particular is designed with a great deal of flexibility, so that students can switch sequences in Grade 11 or Grade 12 if their interests change.

As part of the recent revisions to Alberta’s Mathematics courses, Mathematics 10C, a ‘combined’ course, was introduced as the starting point for both the Mathematics -1 and Mathematics -2 pathways. This was to give students more time to make decisions about which pathway to follow. The combined course also eases transferability between the -1 and -2 course sequences in the event that a student’s post-secondary goals change. Mathematics 31 is generally taken after Mathematics 30; however, Mathematics 31 and Mathematics 30 may be taken concurrently.

The four pathways are targeted at different groups of students and have different progression opportunities (Table 7.2).

Table 7.2: Key features of Mathematics pathways in Alberta

| Pathway | Target group | Key features of curriculum | Assessment | Progression ⁴⁰ |
|---------------------------------|--|---|--|--|
| Mathematics -1 (shown in blue) | The most able students, who plan to enter post-secondary programs such as Engineering, Mathematics, Sciences, some Business Studies, or other programmes that require advanced mathematical skills | Includes topics such as permutations and combinations, relations and functions, sequences and series, and trigonometry. | Final mark in Mathematics 30-1 is the average of the school-awarded mark & the diploma examination mark. ⁴¹ | Post-secondary education in Mathematics or sciences at a university, college, or technical institute, followed by a related career |
| Mathematics -2 (shown in green) | Students wishing to study at the post-secondary level in diverse fields, including arts programs, some engineering technologies, medical technologies, & some apprenticeship programmes. This path will fulfil most students' needs. | Includes topics such as relations, functions and equations, probability, statistics, & trigonometry. | Final mark in Mathematics 30-2 is the average of the school-awarded mark & the diploma examination mark. | Courses at a university, college, or technical institute after high school, that do <i>not</i> need calculus skills |

⁴⁰ Information obtained from: <http://www.education.alberta.ca/media/6744303/fssequence.pdf>

⁴¹ Diploma examination results from 2007/8 to 2011/12 are available at: <http://education.alberta.ca/admin/testing/diploma-results.aspx> Students tend to get higher school awarded marks than examination marks.

| Pathway | Target group | Key features of curriculum | Assessment | Progression ⁴⁰ |
|---|---|--|------------------------------------|---|
| Mathematics -3 (shown in yellow) | Students wishing to enter the workforce or apprenticeships after high school. | Includes topics such as finance, geometry, measurement, & trigonometry. | Teacher assessment? | Apprenticeships to a trade, employment directly after high school. |
| Knowledge and Employability Mathematics (shown in orange) | Students who have experienced challenges or difficulty with their skills in Mathematics & have a history of low achievement. E.g. They have a grade level achievement 2–3 years below their peers, but not below a Grade 4 level. | Includes topics such as number, shape & space, patterns & relations, statistics & probability. ⁴² | Teacher assessment ⁴³⁴⁴ | Employment, further training/courses, or other opportunities not requiring post-secondary education |

Outlines of the curricula for each of the pathways are given at:

http://www.learnalberta.ca/content/mychildlearning/gradeataglance/hs_math.pdf

Full details of all aspects of Mathematics courses are given at:

<http://www.learnalberta.ca/ProgramsOfStudy.aspx?lang=en&posLang=en&Core=Mathematics>

The courses have been approved by instructors from colleges, technical institutions, and universities who build on what students learn in senior high school. Course material is based on input from business and industry leaders who use Mathematics every day.

⁴² Full details of Knowledge and Employability Mathematics (10-4 and 20-4) are available at: http://www.education.alberta.ca/media/645686/math10_06.pdf and at:

<http://www.learnalberta.ca/ProgramOfStudy.aspx?lang=en&ProgramId=174398#498856>

⁴³ Knowledge and Employability courses promote the development of career portfolios. Each portfolio will include exemplars of the student's on- and off-campus experiences. Items appropriate for inclusion are: resumes, samples of written work, awards and/or their representations, teacher and self-evaluation checklists, workplace assessment tools and employer letters of recommendation.

⁴⁴ An example of assessment guidance for knowledge and employability teachers can be found at: http://www.learnalberta.ca/content/kes/pdf/or_ws_tea_03_assess.pdf

8. Provision in Hong Kong

Summary

In Hong Kong, all secondary school students study for the Hong Kong Diploma of Secondary Education (HKDSE), which they achieve at the end of their schooling. Students are not streamed, but there is some differentiation within subjects. The compulsory part of the Mathematics curriculum contains Foundation and Non-Foundation topics. These are assessed in separate parts of the exam paper. The English curriculum is not divided in this way, but two of the assessment papers (reading and listening) contain a choice of two sections. One section assesses the whole range of grades, whilst the other only assesses the bottom 4 grades.

Students can choose to leave school at any time after the end of their Secondary 3 year (the end of Junior Secondary School). Some students transfer to vocational college to study for a Diploma in Vocational Education. This takes between 2 and 4 years, depending how many years of school they have completed before they transfer.

8.1 Introduction

Hong Kong is a specialist administrative region in China with a population of approximately seven million people. It is autonomous from China in all areas except defence and foreign affairs. The education system is run by the Bureau of Education. An overview is shown in Figure 8.1.

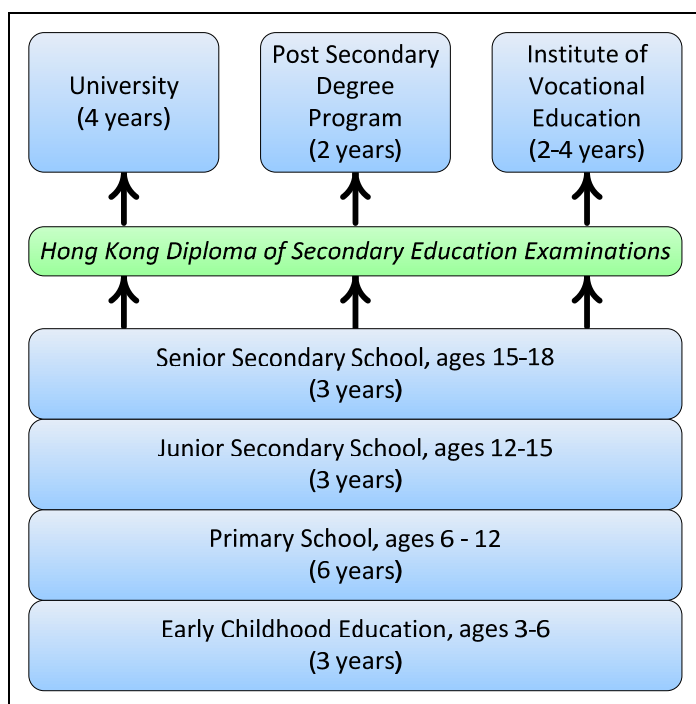


Figure 8.1: The education system in Hong Kong⁴⁵

⁴⁵ Image adapted from: <http://www.ncee.org/programs-affiliates/center-on-international-education-benchmarking/top-performing-countries/hong-kong-overview/>

Schooling in Hong Kong is compulsory from the ages of 6 to 15 (primary education and junior secondary education). Primary education runs from the ages of 6 to 12. Secondary schooling starts at 12 and continues until 18.

Until 2011, Hong Kong secondary schools followed a similar pattern to schools in England. Junior secondary education lasted for three years. After a further two years of education, students took the Hong Kong Certificate of Education Examination (approximately equivalent to O levels). Another two years of study led to the Hong Kong Advanced Level Examination (approximately equivalent to A levels).

In 2012, the Hong Kong Certificate of Education Examination and the Hong Kong Advanced Level Examination were replaced by a single examination, the Hong Kong Diploma of Secondary Education Examinations (HKDSE), taken at the end of secondary education.

8.2 Senior secondary education from 2009

The three years of senior secondary education are optional, but it is expected that most students will continue their education through this stage. There are no academic requirements for entry to senior secondary education, but within individual schools, places may be allocated on the basis of academic performance. Senior secondary students work towards the Hong Kong Diploma of Secondary Education and are expected to follow four core subjects: Chinese Language, English Language, Mathematics and Liberal Studies. They are also expected to choose two or three elective subjects. The elective subjects can be taken from 3 groups:

- Elective subjects (e.g. biology or Chinese History)
- Applied Learning (e.g. creative studies or Engineering and Production)
- Languages (e.g. French and German).

8.2.1 Senior secondary Mathematics curriculum post 2009

All students are expected to follow a core Mathematics curriculum. The aims of the Mathematics curriculum are to:

“(a) further develop students’ mathematical knowledge, skills and concepts;

(b) provide students with mathematical tools for their personal development and future career pathways;

(c) provide a foundation for students who may further their studies in Mathematics or related areas;

(d) develop in students the generic skills, and in particular, the capability to use Mathematics to solve problems, reason and communicate;

(e) develop in students interest in and positive attitudes towards Mathematics learning;

- (f) develop students' competence and confidence in dealing with Mathematics needed in life; and
- (g) help students to fulfil their potential in Mathematics."⁴⁶

The core curriculum is divided into three strands: Number and Algebra; Measures, Shape and Space; and Data Handling. Students can also choose to study additional content in one of two optional units: Calculus and Statistics or Algebra and Calculus. Within the core curriculum the content is divided into Foundation Topics and Non-Foundation topics. The Foundation Topics are intended to provide students with coherent knowledge of the essential concepts and knowledge within Mathematics. Less able students may only study the Foundation Topics, or may study the Foundation Topics and some of the Non-Foundation Topics.

The Mathematics curriculum is arranged into learning units within the three strands. Each learning unit contains several learning objectives that describe the content to be taught. Learning objectives for both Foundation and Non-Foundation topics are included within the same learning units, although the Non-Foundation learning objectives are underlined to identify them. The curriculum does not specify which school year the learning units should be taught in, although it does give a suggested teaching time in hours. An example of a learning unit is shown in Figure 8..

| Learning Unit | Learning Objective | Time | Remarks |
|---|---|------|---|
| 8. Inequalities and linear programming | 8.1 solve linear inequalities in one unknown | 16 | Compound inequalities involving logical connectives "and" or "or" are required. |
| | 8.2 solve quadratic inequalities in one unknown by the graphical method | | |
| | 8.3 <u>solve quadratic inequalities in one unknown by the algebraic method</u> | | |
| | 8.4 <u>represent the graphs of linear inequalities in two unknowns on a plane</u> | | |
| | 8.5 <u>solve systems of linear inequalities in two unknowns</u> | | |
| | 8.6 <u>solve linear programming problems</u> | | |

Figure 8.2: Learning unit from the Number and Algebra Strand of the Hong Kong Curriculum⁴⁷

There are also nine generic skills that are expected to be included within Mathematics teaching, although these are not explicitly taught. They are: collaboration, communication, creativity, critical thinking, information technology, numeracy, problem-solving, self-management, and study skills. Students are also encouraged to develop a positive attitude towards Mathematics and to see the value of it.

⁴⁶ Extract from p2-3 of the Mathematics Curriculum and Assessment Guide (Secondary 4-6): <http://www.edb.gov.hk/en/curriculum-development/kl/ma/curr/ss-math-2007.html>

⁴⁷ Extract from p26-27 of the Mathematics Curriculum and Assessment Guide (Secondary 4-6): <http://www.edb.gov.hk/en/curriculum-development/kl/ma/curr/ss-math-2007.html>

8.2.2 Senior secondary English Language curriculum post 2009

All students are expected to follow a core English Language curriculum. The aims of the English Language curriculum are to:

- *“broaden and deepen the language competencies they have developed through basic education (P1 – S3), so that they are able to use English with increasing proficiency for personal and intellectual development, effective social interaction, further study, vocational training, work and pleasure;*
- *further develop their interest and confidence in using English as their understanding and mastery of the language grow;*
- *further broaden their knowledge, understanding and experience of various cultures in which English is used;*
- *develop and prepare themselves for further study, vocational training or work; and*
- *further develop learning how to learn skills and positive values and attitudes conducive to meeting the needs of our rapidly changing knowledge-based society. These include the interpretation, use and production of texts for pleasure, study and work in the English medium.”⁴⁸*

There is a compulsory part of the curriculum for all students in the three years of senior secondary. Students also study three elective modules, from a choice of eight modules, in Secondary 5 and 6. There is no official reduction in the curriculum content for lower ability students, but teachers are advised that the curriculum can be adapted and reduced for these students.

The curriculum is divided into three strands which state the reasons for learning English. The Interpersonal Strand is about interpersonal communication. The Knowledge Strand allows students to develop and apply knowledge. Finally, the Experience Strand requires students to respond and express real and imagined experiences. Learning targets are given for each of the three strands of English. These define the expected level that students should achieve in each of the subjects.

The curriculum also contains learning objectives grouped into three areas:

- Forms and Functions (e.g. grammatical forms, vocabulary, text types)
- Skills and strategies (e.g. listening, speaking, reading, writing and language development)
- Attitudes

The content of the English language curriculum is arranged into units within modules. The curriculum provides a list of suggested modules, but the content associated with individual modules is listed elsewhere.

There are also nine generic skills that are expected to be included within English Language teaching, although they are not explicitly taught. They are: collaboration, communication, creativity, critical thinking, information technology, numeracy, problem-solving, self-management, and study skills. Students are also encouraged to develop a positive attitude towards English Language and to see the value of it.

⁴⁸ Extract from p9 of the English Language curriculum. http://www.edb.gov.hk/attachment/en/curriculum-development/cla/eng-edu/eng_lang_final.pdf

8.3 Teaching groups

There is no official guidance about how students should be grouped into classes.

8.4 Hong Kong Diploma of Secondary Education assessments (HKDSE)

Students in senior secondary education work towards the HKDSE. The subjects are assessed through a combination of examinations and school based assessment (SBA)⁴⁹. Subjects are graded in one of three ways according to which category they fall into. The four compulsory core subjects⁵⁰ and some elective subjects are graded on a scale from 5 (highest) to 1, where the top students within grade 5 can achieve a 5* or a 5**. Languages other than English and Chinese are graded from A to E. Applied Learning subjects are graded as attained or attained with distinction.

Throughout their senior secondary education, students also develop a Student Learning Profile. This records their achievements and participation during the three years. For students who leave school before the end of secondary education, the Student Learning Profile provides the only evidence of what they have learnt and achieved in school.

8.4.1 Mathematics Assessments within HKDSE

Compulsory Mathematics is assessed through two written papers. The focus, duration and weighting of each paper are shown in

Table 8.. Candidates are allowed to use calculators in both papers.

Table 8.1: Content of compulsory Mathematics papers

| Paper | Description | Weighting (%) | Duration |
|----------|--|---------------|-----------|
| 1 | Conventional questions Section A (70 marks) assesses the Foundation Topics Section B (35 marks) assesses Foundation and Non-Foundation Topics | 65 | 2 ¼ hours |
| 2 | Multiple-choice questions Section A (2/3 of paper marks) assesses Foundation Topics Section B (1/3 of paper marks) assesses Foundation and Non-Foundation Topics. | 35 | 1 ¼ hours |

Students also complete two SBAs, one in Secondary 5 and one in Secondary 6. They test problem solving, mathematical reasoning, data handling and communication of mathematical ideas.

⁴⁹ SBA consists of the assessments that schools carry out during the course which are set and marked by the teachers. The proportion of SBA within subjects varies, and many subjects contain no SBA. For further information about SBA see <http://www.hkeaa.edu.hk/en/sba/>.

⁵⁰ The compulsory core subjects are Chinese Language, English Language, Mathematics and Liberal Studies.

8.4.2 English Assessments within HKDSE

English Language is assessed through four written papers and SBA. The focus, duration and weighting of each paper are shown in

Table 8..

Table 8.2: Content of English Language papers

| Paper | Description | Weighting (%) | Duration |
|--------------|--|----------------------|------------------|
| 1 | Reading All candidates do part A (10% of subject mark). Part B has a choice of parts (10% of subject mark). Candidates choose between B1 (easier section) and B2 (harder section). Candidates choosing B1 can only achieve a level 4 or below. | 20 | 1 ½ hours |
| 2 | Writing Part A (compulsory, 10% of subject mark) is a short guided task (200 words) Part B (compulsory, 15% of subject mark) is a longer, open-ended writing task (400 words) | 25 | 2 hours |
| 3 | Listening & Integrated skills All candidates do part A (15% of subject mark). Part B has a choice of parts (15% of subject mark). Candidates choose between B1 (easier section) and B2 (harder section). Candidates choosing B1 can only achieve a level 4 or below. | 30 | About 2 hours |
| 4 | Speaking Part A (group interaction), a group discussion on a short text. Part B (individual response), answering questions based on group discussion. | 10 | About 20 minutes |
| | School based assessment Part A (10%): reading, commenting and reflecting on four texts, then discussing with classmates. Assessed on oral performance in discussion. Part B (5%): Group interaction or individual presentation on modules studied in elective curriculum. Assessed on oral performance. | 15 | |

8.5 Progression from Hong Kong Diploma of Secondary Education (HKDSE)

The progression routes available to students depend on the results that they achieve. Students with a minimum of a level 3 pass in all the required HKDSE subjects can progress to university. Students with a minimum of a level 2 pass in five HKDSE subjects can either progress to a 2-year post-secondary degree programme where they can achieve an Associate's Degree, or they can study at the Institute of Vocational Education for 2 to 4 years to achieve a Higher Diploma, a Technical Certificate or a Technical Diploma.

8.6 Diploma in Vocational Education

Students can leave secondary school any time after the end of their Secondary 3 year. Less able students transfer to a vocational college where they study for a Diploma in Vocational Education (DVE). The course lasts for 3 to 4 years for students starting in Secondary 4, although students can start later and take less time. The diploma is available in the following subjects:

- Business and Services
 - Business
 - Hairdressing
 - Beauty Care
 - Fitness and Sports Science
- Engineering
 - Computer-Aided Product Engineering
 - Mechanical Engineering
 - Building Services Engineering
 - Automotive Technology
 - Services Engineering
 - Electrical Engineering
- Design and Technology
 - Print Media
 - Digital Electronics Technology
 - Fashion Textile Design and Merchandising
 - Jewellery Arts and Design
 - Information Technology

The course is modular, with credit from each module contributing to the DVE. As well as modules from the subject, all students study five generic skills modules, which include a Mathematics module and a Vocational English module⁵¹.

⁵¹ The other generic modules are vocational Chinese, Information Technology, and Whole Person Development.

8.7 Progression from the Diploma in Vocational education

Students who complete the DVE are qualified for some careers in their subject area. For example, students completing the Business DVE may work as assistant clerical officers, logistics assistants or sales co-ordinators. Students who have met the credit requirements and passed their DVE can also progress to the Higher Diploma programmes that are offered by the Vocational Training College.

9. Conclusion

It can be concluded that provision for less able students of English and Mathematics varies considerably both within and across countries. Three of the four high performing jurisdictions considered in this investigation provide courses and/or qualifications specifically for such students. In Alberta and Singapore, courses for the least able focus on knowledge and skills which will have a practical value in the workplace, rather than on preparing students for higher level academic study in English and Mathematics. While alternative provision is also available to low achieving students in England, in the form of Functional skills, Cambridge Progression, and Entry Level Certificates, many secondary schools choose to support these students on GCSE courses, possibly because GCSEs are perceived to have a greater currency, even at low grades.