



MATHEMATICS 2 AND NUMERACY 2 PROJECT AND GENERAL MAINTENANCE OF SUBJECT TERMS Detailed final report

VERSION: 1.0

DATE: THURSDAY, 23 SEPTEMBER 2004

DOCUMENT: MATHS2_DETAILED_FINAL_REPORT_V1_0.DOC

Commercial in Confidence

© Curriculum Corporation and *education.au limited*, 2004

Amendment History

Date	Issue	Comment	Person
9/9/2004	0.1	Document created	Steven Haby
16/9/2004	0.2	Document amended incorporating comments received from Nigel Ward, Anne Camfield, Leanne Rowe (Maths 2 PM) and Joe Pelligrino (LOTE 1 PM)	Steven Haby
23/9/2004	1.0	Final report released to ScOTMG	Steven Haby

Approvals

Name/Organisation/Position	Signature	Date
Nigel Ward TLF Interoperability analyst		
Anne Camfield Curriculum Corporation Manager, SCIS		
Kate Dibben <i>education.au limited</i>		
Steven Haby TLF Thesaurus Analyst		

Disclaimer

"The material contained in this Report is for general information purposes only. Any use of the material is at your own risk. To the extent permitted by law, neither Curriculum Corporation nor ***education.au limited*** will be liable for any loss or damage suffered as a result of any party relying upon this Report."

Table of Contents

1	INTRODUCTION	1
	1.1 Purpose	1
	1.2 Audience	1
	1.3 Acknowledgements	1
2	DEVELOPMENT OF DRAFT SUBJECT TERMS	2
	2.1 Process diagram	2
	2.2 Subject term summary	3
	2.3 Issues arising	3
	2.3.1 Access to learning objects	3
	2.3.2 Level of specificity	3
	2.3.3 Curricula documentation	3
	2.3.4 Resources	3
3	CONCEPTS COVERED IN VERSION 4.3	4
	3.1 Mathematics and Numeracy 2 subject terms	4
	3.2 LOTE 1 subject terms	4
	3.3 New Zealand science subject terms	5
4	APPENDIX	6
	4.1 Subject terms	Error! Bookmark not defined.
	4.1.1 New subject terms	Error! Bookmark not defined.
	4.1.2 Modified existing subject terms	Error! Bookmark not defined.
5	SOURCES	51
	5.1 List	51

1 Introduction

1.1 Purpose

This report outlines the process used and issues encountered when developing subject terms for the TLF Mathematics and Numeracy 2 Project and other subject terms developed or reviewed as part of general maintenance undertaken at the same time. A detailed list of new and revised subject terms is included as an Appendix to this report.

1.2 Audience

ScOT Management Group, Steve Sunter, TLF Mathematics 2 Project Manager, TLF LOTE 1 Project Manager

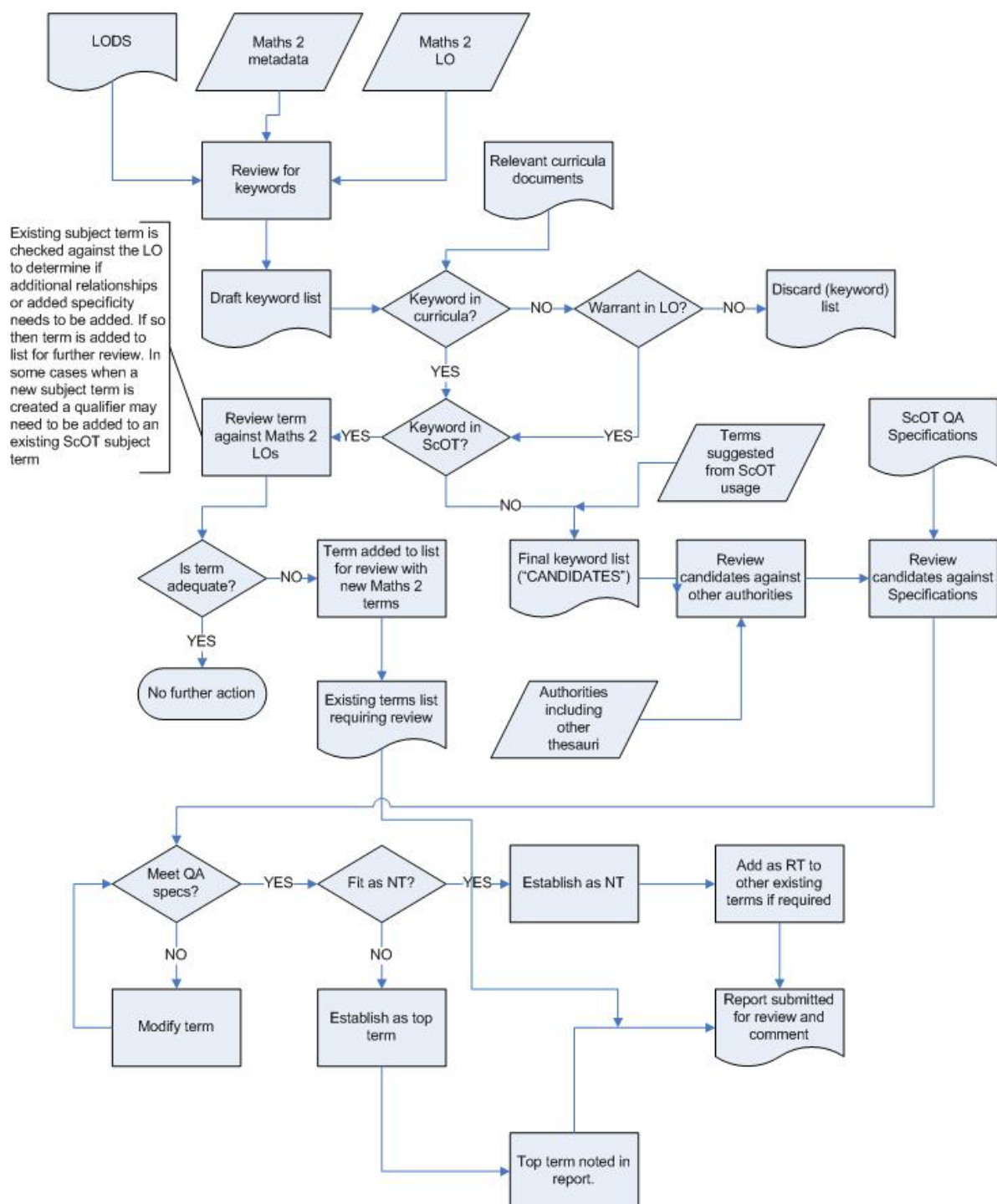
1.3 Acknowledgements

The ScOT Management Group acknowledges the assistance of Steve Sunter, Metadata Analyst; Leanne Rowe, Maths 2 Project Manager; Joe Pelligrino, LOTE 1 Project Manager and relevant TLF Subject Matter Experts.

2 Development of draft subject terms

2.1 Process diagram

The process used to develop the set of draft subject terms is represented in the following diagram.



2.2 Subject term summary

The following table compares the number of subject terms in Version 4.2 and the subject terms developed for Version 4.3. The majority of the subject terms developed were for the TLF Mathematics and Numeracy 2 Project with the balance as a result of revising subject terms relating to LOTE (specifically Chinese languages) and other issues identified by TLF.

	Version 4.2	Version 4.3
Number of subject terms	8, 791	8, 941
Preferred subject terms	7, 087	7, 209
Non preferred subject terms	1, 704	1, 732
Top terms	193	179

2.3 Issues arising

2.3.1 Access to learning objects

Access to the learning objects (LO) provided an excellent opportunity to review the content of the LO and the associated metadata for concepts that would be used as a basis for new subject terms. Twenty three LO were reviewed. For future subject reviews and builds the LO and metadata should be the reviewed in the first instance.

2.3.2 Level of specificity

Reviewing the LO and associated metadata enabled a list of keywords as candidates for subject terms to be drawn up that was more focussed to TLF requirements. Many of the LO developed for Mathematics and Numeracy 2 focus on shapes and solids. Whilst ScOT has good coverage of the basic shapes and solids (e.g. cubes, cylinders, quadrilaterals) additional specificity was required based on the review.

It was necessary to seek advice regarding the level of specificity concerning types of Johnson Solids (there are 92 such examples) which was sought through the ScOTCG and OZ_TL listserv. Feedback was received from curriculum officers in New Zealand, South Australia and Western Australia and some teacher librarians.

It was found that the level of specificity generally was the same as the level and scope of coverage covered in the LO.

2.3.3 Curricula documentation

Relevant mathematics curricula and syllabus documentation was reviewed in order to seek further advice and clarification on the draft list of words developed from reviewing the LO and metadata. Some curricula documentation was more useful than others, e.g. New Zealand mathematics curricula included glossaries of words and phrases used in mathematics.

2.3.4 Resources

Two resources were extensively referred to during this project. The MathWorld site (<http://mathworld.wolfram.com/>) was extensively referenced for information relating to specific concepts (particularly shapes) covered in the TLF Mathematics and Numeracy 2 Project. Although primarily aimed at the upper secondary and tertiary education sectors it nonetheless provided considerable amounts of useful information. This site has been indexed in EdNA Online and catalogued in SCIS.

Omniglot : a guide to writing systems (<http://www.omniglot.com>) site was referenced for information relating to alphabets and components of characters (letters) when reviewing LOTE subject terms. The author is not a LOTE teacher but has, according to the biography on the web site, extensive experience and qualifications in speaking and writing in a number of

languages. This site was the most useful site found within the timeframes available to undertake a review of the LOTE subject terms relating to Chinese languages and alphabets. Omniglot is indexed on EdNA Online.

The over reliance on two websites is not ideal however given the complex nature of some of the concepts, the short time frames and the wealth of information found (in some cases backed up by searches using other sites and resources) this approach was the most practicable.

Further advice was sought from teacher librarians on OZ_TL discussion group and through the ScOT Consultative Group on levels of specificity in relation to Johnson Solids – a concept found on MathWorld. This advice was found to be extremely useful in making a decision on the extent to which the subject term for Johnson Solids was expanded.

3 Concepts covered in Version 4.3

The following is a list of all subject terms (either new or modified from ScOT) which have been labelled “CANDIDATE.”

3.1 Mathematics and Numeracy 2 subject terms

Subject terms developed generally covered the following concepts:

- Shapes
- Counting
- Solids
- Units of measurement including volume, length, capacity
- Perspectives such as different types of views and elevations
- Angles
- Lines
- Space
- Number
- Number operations
- Patterns
- Algebra
- Data analysis
- Networks
- Place value
- Integers and directed numbers

3.2 LOTE 1 subject terms

Subject terms for LOTE 1 concepts have been included following feedback received from TLF. Concepts covered include:

- Different types of writing systems with an emphasis on Chinese and Japanese alphabets.
- Components of a writing system
- Components of letters, i.e. strokes and dots
- Types of words.
- Chinese character components

- Radical and stem functions
- Compound characters
- Character structures
- Compound words

The central framework of the LOTE 1 LO are underpinned by the findings in the report *Identifying critical factors for effective teaching and learning of Chinese, Japanese and Korean writing systems* published by the Research Centre for Languages and Cultures Education, University of South Australia in 2001 as part of the NALSAS (National Asian Languages and Studies in Australian Schools Strategy).

Many of the LOTE 1 LO focuses on the Chinese Character Catalogue of 400 items or components which make up parts of each Chinese letter. Discussions with the LOTE 1 Project Manager agreed that there was not sufficient warrant to include subject terms for each of these components.

Further work will need to be undertaken on subject terms relating to components of a character and typographical families. These are not considered to be critical at this stage. For example at present it is considered unlikely that there would be curricula warrant for description of the elements of a roman character, e.g. ascender, bar, baseline, bowl, contrast, counter, loop and so on. Furthermore it is unlikely that descriptions will be required for different types of typographical families.

3.3 New Zealand science subject terms

Feedback on other concepts covered in ScOT has been received from TLF and the NZ Science Subject Terms Project team. Amendments to subject terms have been made and included in this list.

Further work is required in regards to the subject term relating to Waka. Further advice will need to be sought from New Zealand.

4 Appendix

No	Subject term	Comment from Thesaurus Analysis	Feedback received	Recommendation and outcome for subject term.
1.	Abacus UF: Counting frames BT: Mathematical instruments RT: Counting	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus, SCISHL and LCSH.		
2.	Abjads UF: Consonant alphabets BT: Writing systems NT: Arabic script Hebrew script RT: Alphabets	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC queried the level of specificity and whether this should be a keyword in TLF. NW queried as whether preferred subject term is useful or well known sufficiently.	Whilst TA agrees that Abjads is an uncommon subject term it is recommended that this subject term be retained as it is required for LOTE 1 . It is not found on LCSH or a definition provided in Macquarie Recommendation Retain subject term but change UF to preferred subject term and add preferred subject term as UF. Add SN. Consonant alphabets SN: Use for resources about alphabets that are represented primarily by consonants. UF: Abjads BT: Writing systems NT: Arabic script Hebrew script RT: Alphabets

3.	Accented letters BT: Letters (Writing) RT: Alphabets	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC sought further information about what this subject term means.	Accented letters are those characters that have special marks or strokes, e.g. tildes, macrons and so on and that are used to indicate vowel stress or tone. A definition is provided in Macquarie. It is not warranted at this stage to establish NT under Accented letters for specific types of accents, e.g. Macrons, Carons and so on although further advice will be sought from LOTE SME.
4.	Acetic acids UF: Vinegar BT: Acids	Corrected in response to feedback received from NZ Science Subject Terms Project team.	AC indicated that this should not be plural but rather singular.	Agree with AC recommendation. This is an error and should be changed back to the singular. Acetic acid UF: Vinegar BT: Acids
5.	Alphasyllabaries USE: Syllabic alphabets	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		
6.	Amicable numbers UF: Friendly numbers BT: Numbers	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus and LCSH.	Maths 2 PM indicated that this concept is very specific and would generally not be covered at this level. AC queried that these concepts were very specific.	Agree with comments. Amicable numbers to be deleted as preferred term. Recommendation Consider establishing Amicable numbers as a USE to Numbers Amicable numbers USE: Numbers
7.	Arabic script BT: Abjads RT: Arabic language	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		Arabic script BT: Consonant alphabets RT: Arabic language

8.	Archimedean solids BT: Polyhedra	Required for Mathematics and Numeracy 2 Project Source: Maths Thesaurus and MathWord website.		
9.	Armenian alphabet BT: Alphabets RT: Armenian language	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		
10.	Arrow diagrams BT: Diagrams RT: Processes Quality control	Required for Mathematics and Numeracy 2 Project Source: Maths Thesaurus and MathWorld website.	Maths 2 PM recommended that Tree diagrams be added. AC queried RT Quality control.	Agree that RT Quality control is a tenuous link at best. Happy to remove it. Sources consulted (MathWorld and Maths Thesaurus) indicated that some arrow diagrams are used in quality control. Tree diagrams are those that are used in probability. This concept can be established as a NT under Diagrams with a RT to Probability. Recommendation Remove RT Quality control Establish Tree diagrams as a NT under Diagrams. Arrow diagrams BT: Data representation BT: Diagrams RT: Processes Tree diagrams BT: Data representation BT: Diagrams

				RT: Probability
11.	Arrowheads BT: Quadrilaterals RT: Arrows	Required for Mathematics and Numeracy 2 Project	Maths 2 PM recommended that this subject term is very specific and would not be used at this level. AC queried the level of specificity.	Agree with comments. Removed from ScOT.
12.	Arrows BT: Symbols RT: Arrowheads	Required for Mathematics and Numeracy 2 Project. Source: LCSH and Maths Thesaurus.		
13.	Back to back stem and leaf plots BT: Stem and leaf plots	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus.	AC queried this compound subject term and recommended it become a UF to Stem and leaf plots. NW queried specificity.	Following further consideration it was agreed to establish this as a UF under Stem and leaf plots. Back to back stem and leaf plots USE: Stem and leaf plots
14.	Bird's eye view BT: Perspective (Visual arts) RT: Architectural drawing	Required for Mathematics and Numeracy 2 Project. Source: LCSH and Art and Architecture Thesaurus.		
15.	Bisectors BT: Lines NT: Perpendicular bisectors RT: Angles	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus.		
16.	Bivariate data BT: Data	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus.		
17.	Blocks	Required for Mathematics and	AC queried this term and argued that	Agree with comments. Blocks are also used for building. At this stage there is

	BT: Toys RT: Polyhedra	Numeracy 2 Project. Source: LCSH and MathWorld.	not all blocks are toys.	<p>no other subject term in ScOT that relates to building blocks.</p> <p>A number of alternatives were considered including Toy blocks and Toy bricks.</p> <p>LCSH has Blocks (Toys) as a BT to Toys and Blocks (Building materials). In theory both concepts are similar but they are different as many blocks for toys come in different shapes and sizes.</p> <p>Another alternative is to establish Toy blocks with a BT to Toys and at a later stage if required establish Building blocks as a NT under Building materials. This would remove the requirement of qualifiers.</p> <p>Recommendation</p> <p>Establish Blocks (Toys) as a NT under Toys and Blocks (Building materials) as a NT under Building materials. This follows the model in LCSH.</p> <p>Blocks (Toys) BT: Toys RT: Polyhedra</p> <p>Blocks (Building materials) BT: Building materials</p>
18.	Body mass index UF: BMI BT: Mass units RT: Physiology	Developed in response to feedback received from TLF relating to Science 2 LO. Source: MeSH (Medical subject headings)		

19.	Boolean algebra BT: Algebra RT: Karnaugh maps Sets (Mathematics)	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus and LCSH.	Maths 2 PM recommended that this subject term is not necessary and should be deleted.	Agree. Removed from ScOT.
20.	Borders BT: Visual arts elements RT: Edges	Required for Mathematics and Numeracy 2 Project. Source: Art and Architecture Thesaurus.	Maths 2 PM indicated that Edges is the term used in Mathematics and that there is a tenuous link to Borders. AC queried whether the linkage should be made more explicit with maths.	Agree in principle with comments. Edges is an existing subject term in ScOT: Edges SN: Use for works on the join of two parts of a solid shape. BT: Solids (Mathematics) Recommendation Removed RT Edges from Borders
21.	Box and whisker plots USE: Box plots	Required for Mathematics and Numeracy 2 Project. Created a USE to Box plots based on curricula warrant.		
22.	Box plots UF: Box and whisker plots BT: Data representation	Added UF Box and whisker plots.		
23.	Braces BT: Parentheses RT: Sets (Mathematics)	Required for Mathematics and Numeracy 2 Project. Source: MathWorld website and Maths Thesaurus.	AC queried whether Symbols should also be added as a BT. Offered an alternative with Parenthesis being changed to a USE.	Parenthesis was developed as part of the LOTE, Literacy and Literature build. The BT are Mathematical notation and Punctuation. Symbols could be added as a BT to Punctuation, i.e. punctuation symbols. Recommendation Establish Symbols as a BT to

				<p>Punctuation.</p> <p>Symbols</p> <p>BT: Rhetorical devices</p> <p>BT: Semiotics</p> <p>NT: Arrows</p> <p>NT: Heraldry</p> <p>NT: Ideograms</p> <p>NT: Logograms</p> <p>NT: Mandalas</p> <p>NT: Punctuation</p> <p>NT: Semantic phonetic compounds</p> <p>RT: Beliefs</p> <p>Punctuation</p> <p>BT: Language skills</p> <p>BT: Symbols</p> <p>NT: Apostrophes (Punctuation)</p> <p>NT: Colons</p> <p>NT: Commas</p> <p>NT: Dashes</p> <p>NT: Dot points</p> <p>NT: Exclamation marks</p> <p>NT: Full stops</p> <p>NT: Hyphens</p> <p>NT: Lower case</p> <p>NT: Parentheses</p> <p>NT: Question marks</p> <p>NT: Quotation marks</p> <p>NT: Semicolons</p> <p>NT: Upper case</p>
--	--	--	--	--

24.	Brackets USE: Parentheses	Required for Mathematics and Numeracy 2 Project. Source: MathWorld website and Maths Thesaurus.		
25.	Building plans USE: Architectural drawing	Required for Mathematics and Numeracy 2 Project. Created USE based on curricula warrant.		
26.	Bus routes BT: Public transport Transport networks RT: Buses	Required for Mathematics and Numeracy 2 Project. Source: ARRB Thesaurus.		
27.	Calculators BT: Mathematical instruments RT: Arithmetic			Established subject term following comments by Maths 2 LO. Added RT Arithmetic.
28.	Cartesian planes BT: Planes	Required for Mathematics and Numeracy 2 Project		
29.	Category data BT: Data	Required for Mathematics and Numeracy 2 Project. Cited extensively in NZ curricula.	AC disagreed with this subject term and would prefer Categories with a BT to Data descriptors.	ScOT does not have data descriptors. Further review of this concept recommends that this subject term be removed from ScOT.
30.	Character strokes BT: Letters (Writing) NT: Dot stroke Horizontal strokes Left falling strokes Right falling strokes Rising strokes	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC queried the need for the NTs.	The components of characters including Chinese characters are an important component of the LO for LOTE 1. Furthermore discussions with the LOTE 1 PM indicated that there are in fact 24 separate strokes which will be included in future LO at some stage. Recommendation It is recommended that these subject

	Turning strokes Vertical strokes			terms be retained and that further analysis be undertaken to identify suitable subject terms for these additional strokes.
31.	Character structures BT: Letters (Writing)			Added subject term following discussions with LOTE 1 PM. Further work will be required for this subject term in particular the level of specificity.
32.	Characters (Writing) USE: Letters (Writing)	Developed in response to feedback on coverage of LOTE 1 concepts.		
33.	Chinese alphabet BT: Logographic writing systems NT: Simplified Chinese RT: Chinese languages			<p>Following further discussions with LOTE 1 PM added the following subject term. Radicals and Stems are key concepts that underpin the TLF Chinese LOTE 1 LO></p> <p>Added NT Chinese characters under Letters (Writing) and Chinese alphabet Under Chinese characters added Radicals and Stems as NT Established Chinese alphabet as RT to Chinese characters.</p> <p>Chinese alphabet BT: Logographic writing systems NT: Chinese characters NT: Simplified Chinese RT: Chinese languages</p> <p>Chinese characters BT: Chinese alphabet</p>

				BT: Letters (Writing) NT: Radicals NT: Stems
34.	Chords (Lines) BT: Circles Lines	Required for Mathematics and Numeracy 2 Project Revised reference structure and split original subject term into two. See # 31 below.	AC disagreed with the reference structure and would prefer Circles to be RT.	Following further review it was agreed to change the reference structure as follows. Chords (Lines) BT: Lines RT: Circles
35.	Chords (Music) BT: Structural elements RT: Cadences Harmony	Qualifier added in response to homograph Chords (Lines)		
36.	Circles BT: Shapes (Geometry) NT: Arcs Centres Chords (Lines) Concentric circles Diameter Great circles Radius Secants Segments Semicircles Tangents	Revised for Mathematics and Numeracy 2 Project		

	RT: Circumferences			
37.	Clinometers BT: Measuring instruments RT: Angles Height	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus.	AC queried the level of specificity and why this subject term is needed.	A device for measuring the slope of something. It is widely used to measure the angle of elevation/depression when finding the heights of buildings and trees. On further reflection this subject term could be removed from ScOT.
38.	Closed curves BT: Curves NT: Simple closed curves	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus.	AC queried the level of specificity and why this subject term is needed.	Concept is covered in some of the LO that identify different shapes and components of shapes and should be retained.
39.	Collinear points BT: Points	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus.		
40.	Colour perception BT: Perception RT: Colour	Revised following feedback received from TLF.		
41.	Composite bar graphs BT: Column graphs	Required for Mathematics and Numeracy 2 Project.	Maths 2 PM indicated that this subject term is too specific. Bar graphs should be sufficient.	Bar graphs is a USE to Bar charts in ScOT. Agree that this subject term is too specific and could be removed.
42.	Compound characters BT: Letters (Writing) RT: Chinese characters			Established following further discussion with LOTE 1 PM.
43.	Computer programming UF: Programming BT: Computers RT: Data processing	Revised for Mathematics and Numeracy 2 Project. Added Programming as UF.		

44.	Concentric circles BT: Circles	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus.		
45.	Concurrent lines BT: Lines RT: Points	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus.	AC disagreed with RT Points.	Two or more lines are said to be concurrent if they intersect in a single point. At the time it was thought that Points might be a useful cross reference. Recommend that it be retained.
46.	Cones (Solids) BT: Solids (Mathematics)	Amended qualifier following feedback received from TLF. Original qualifier was Shapes.		
47.	Congruent figures BT: Shapes (Geometry) RT: Congruence	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus.		
48.	Consonant alphabets USE: Abjads	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		
49.	Containers BT: Technology NT: Tanks RT: Packaging Transport	Amended subject term. Added BT Technology and RT Packaging.		
50.	Contour lines BT: Cartography Lines	Required for Mathematics and Numeracy 2 Project. Source: LCSH, MathWord and Maths Thesaurus.	AC queried whether Contour lines and Contours are needed. Contours could be combined.	Agree with this. Deleted Contours and retained Contour lines as preferred subject term. Combine both subject terms as follows:

	RT: Contour maps Contours Topographic maps			Contour lines BT: Cartography Lines RT: Altitude Contour maps Topographic maps
51.	Contours BT: Altitude Cartography RT: Contour lines Contour maps Topographic maps	Amended subject term. Source: LCSH, MathWorld and Maths Thesaurus.	See comments above.	
52.	Convex polyhedra USE: Polyhedra	Required for Mathematics and Numeracy 2 Project. Source: MathWord and Maths Thesaurus.		
53.	Cost time graphs BT: Graphs RT: Costs Time (Measurement)	Required for Mathematics and Numeracy 2 Project.	Maths 2 PM indicated that subject term is too specific. Graphs or Straight line graphs should be sufficient. AC queried the level of specificity.	Agree with recommendation. Deleted from ScOT.
54.	Counting frames USE: Abacus	Required for Mathematics and Numeracy 2 Project.		
55.	Crescents BT: Shapes (Geometry)	Required for Mathematics and Numeracy 2 Project. Source: MathWord website and Maths		

		Thesaurus.		
56.	Crotchets BT: Musical notes	Required for Mathematics and Numeracy 2 Project. Source: LCSH.		
57.	Decagram BT: Stars (Polygons)	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and Maths Thesaurus.	Maths 2 PM indicated that this subject term not required. AC queried the level of specificity.	Agree with recommendation. Deleted from ScOT.
58.	Decimal numbers BT: Place value NT: Digits	Amended existing subject term. Added NT Digits. Source: MathWorld and Maths Thesaurus.	AC queried whether Numbers should be a BT rather than Place value. Disagreed with NT Digits as a digit is a whole number and/or integer.	Agree with recommendation. Established Place value as RT and Numbers as BT. Established Digit as NT under Whole numbers Decimal numbers BT: Numbers RT: Place value Digits BT: Whole numbers
59.	Decomposition (Microbiology) BT: Microbiology NT: Biodegradation RT: Decomposers Organic matter	Added qualifier following inclusion of homograph Decomposition (Arithmetic).		
60.	Decomposition (Arithmetic) BT: Arithmetic RT: Subtraction	Required for Mathematics and Numeracy 2 Project. Extensively cited in NZ curricula. Source: MathWorld website.	AC queried whether this term is needed.	Subject term cited in NZ and NSW curricula. Should be retained.

61.	Depth BT: Length units	Required for Mathematics and Numeracy 2 Project. Source: LCSH, MathWorld and Maths Thesaurus.	Maths 2 PM indicated that this subject term probably not required. AC disagreed with reference structure. Depth is not a length unit but rather a measurement.	Agreed with comments but decided to retain with modified reference structure. Established as NT under Measurement and established new NT Fathoms as NT under Units of measurement and RT to Depth. Depth BT: Measurement RT: Fathoms Fathoms BT: Units of measurement RT: Depth
62.	Dials BT: Measuring instruments RT: Speedometers	Required for Mathematics and Numeracy 2 Project. Source: LCSH.	AC disagreed with reference structure in that they do measure per se but rather display.	Agree with comments. Proposed recommendation Establish Instrumentation under Technology as NT. Establish Dials as NT. Link Scientific instruments and Measuring instruments as NT Instrumentation (Technology) BT: Technology NT: Dials Measuring instruments Scientific instruments
63.	Diamonds (Shapes) USE: Rhombuses	Required for Mathematics and Numeracy 2 Project. Source: MathWord and Maths Thesaurus.		

64.	Diamonds (Solids) BT: Carbon RT: Jewellery	Added qualifier following addition of homograph Diamonds (Shapes)	AC queried the qualifier.	Agree with recommendation. Changed qualifier to Gemstones Diamonds (Gemstones) BT: Carbon RT: Jewellery
65.	Digits BT: Decimal numbers	Required for Mathematics and Numeracy 2 Project. Source: MathWord and Maths Thesaurus.	AC disagreed with reference structure.	See comments under Decimal numbers
66.	Divine proportions USE: Golden ratios	Required for Mathematics and Numeracy 2 Project. Source: MathWorld.		
67.	Dodecahedrons BT: Polyhedra	Required for Mathematics and Numeracy 2 Project. Source: MathWorld.		
68.	Dot plots BT: Data representation	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus and MathWorld.		
69.	Dot stroke BT: Character strokes	Required for Mathematics and Numeracy 2 Project. Source: Omniglot website (www.omniglot.com)	AC queried specificity.	This subject term is required for LOTE 1 LO specifically for Chinese LO.
70.	Double column graphs BT: Column graphs	Required for Mathematics and Numeracy 2 Project. Cited extensively in the curricula. Source: MathWorld and Maths Thesaurus.	Maths 2 PM indicated subject term not required.	Agree with recommendation. Removed from ScOT.
71.	Edges SN: Use for works on the join of two parts of a solid	Required for Mathematics and Numeracy 2 Project.		See comments under Borders.

	shape. BT: Solids (Mathematics) RT: Borders			
72.	Egyptian fractions BT: Fractions	Required for Mathematics and Numeracy 2 Project. Cited in NZ and NSW curricula.	Maths 2 PM indicated subject term not required. AC queried the level of specificity.	Agreed with recommendation. Removed from ScOT.
73.	Elevation BT: Perspective (Visual arts)	Required for Mathematics and Numeracy 2 Project. Source: Art and Architecture Thesaurus.		
74.	Envelopes BT: Paper products	Required for Mathematics and Numeracy 2 Project		
75.	Equal addends BT: Arithmetic	Required for Mathematics and Numeracy 2 Project. Source: LCSH.	Maths 2 PM indicated subject term not required however Addends would suffice. AC queried the level of specificity.	Agreed with recommendation. Changed to Addends but retained Equal addends as UF Addends UF Equal addends BT Arithmetic
76.	Equivalent sets BT: Sets (Mathematics)	Required for Mathematics and Numeracy 2 Project. Source: LCSH and Maths Thesaurus.		
77.	Expanded sets BT: Numbers	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus and MathWorld.		
78.	Exploration BT: Geography RT: Explorers	Required for Mathematics and Numeracy 2 Project. Source: LCSH.	Maths 2 PM indicated that the concept Exploration in mathematics is different to that for geography and is related to Investigations. Further work is	This subject term was developed for specifically a LO in Maths 2 that was set on a planet with a robotic probe was used to explore rocks using a set of

	Travel		recommended.	coordinates and grid. Noted comments for future analysis and subject term will be retained.
79.	Figurate numbers BT: Numbers RT: Geometry Perfect squares Points	Required for Mathematics and Numeracy 2 Project. Source: MathWorld.	AC queried the level of specificity and the RT Points.	Retained following further review of concepts. Removed RT Points Figurate numbers BT: Numbers RT: Geometry Perfect squares
80.	Fractals BT: Shapes (Geometry)	Required for Mathematics and Numeracy 2 Project. Source: MathWorld.	Maths 2 PM indicated subject term not required.	Agreed with recommendation. Removed from ScOT
81.	Friendly numbers USE: Amicable numbers	Required for Mathematics and Numeracy 2 Project. Source: MathWord and Maths Thesaurus.	Maths 2 PM indicated subject term not required. AC queried the level of specificity.	Agreed with recommendation. Removed from ScOT.
82.	Function graphs BT: Graphs	Required for Mathematics and Numeracy 2 Project.		
83.	Gauges BT: Measuring instruments	Required for Mathematics and Numeracy 2 Project. Source: LCSH.		
84.	Genealogy UF: Whakapapa	Amended subject term following feedback received from NZ Science		

	BT: Family history NT: Family trees Peerage RT: Eugenics Families Heraldry Historiography Kinship Waka	Subject Terms Project team.		
85.	Glyphs BT: Hieroglyphics	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		
86.	Golden means USE: Golden ratios	Required for Mathematics and Numeracy 2 Project Source: MathWorld.		
87.	Golden ratios UF: Divine proportions Golden means Golden sections BT: Numbers RT: Distances Ratio Shapes (Geometry)	Required for Mathematics and Numeracy 2 Project. Source: MathWorld.	Maths 2 PM indicated subject term not required.	Agreed with recommendation. Removed from ScOT.
88.	Golden sections USE: Golden ratios	Required for Mathematics and Numeracy 2 Project. Source: MathWorld.		
89.	Great circles	Required for Mathematics and	Maths 2 PM indicated subject term not	Agreed with recommendation.

	BT: Circles RT: Equator Radius Spheres	Numeracy 2 Project. Source: Maths Thesaurus.	required.	Removed from ScOT
90.	Greek alphabet BT: Alphabets RT: Greek language	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		
91.	Half moon USE: Semicircles	Required for Mathematics and Numeracy 2 Project		
92.	Hebrew script BT: Abjads RT: Hebrew language	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		
93.	Height BT: Length RT: Clinometers	Required for Mathematics and Numeracy 2 Project. Source: LCSH and MathWorld.		
94.	Heptagons UF: Septagons BT: Polygons	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus.		
95.	Heptagrams BT: Stars (Polygons)	Required for Mathematics and Numeracy 2 Project. Source: MathWorld.	AC queried the level of specificity.	Agreed with recommendation and other comments in relation to Stars (Polygons). Removed from ScOT.
96.	Heptominoes	Required for Mathematics and	Maths 2 PM indicated subject term not	Agreed with recommendation and

	BT: Polyminos	Numeracy 2 Project. Source: Maths Thesaurus and MathWorld.	required. AC queried the level of specificity.	removed from ScOT.
97.	Hexominos BT: Polyminos	Required for Mathematics and Numeracy 2 Project Source: Maths Thesaurus and MathWorld.	Maths 2 PM indicated subject term not required. AC queried the level of specificity.	Agreed with recommendation and removed from ScOT.
98.	Hieroglyphics BT: Logographic writing systems NT: Glyphs RT: Pictographs	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com) and LCSH.		
99.	Horizontal bar graphs BT: Bar charts	Required for Mathematics and Numeracy 2 Project	AC queried whether this should be a USE.	Agreed with recommendation and changed to a USE. Horizontal bar graphs USE Bar charts
100.	Horizontal strokes BT: Character strokes	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC queried whether this should be a USE.	Retained as is required for LOTE 1 subject terms.
101.	Hungarian runes BT: Alphabets RT: Hungarian language	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC queried the relevance of Hungarian. Is it taught in the curricula?	Hungarian is taught in the curricula for Victorian LOTE (Victoria has the most comprehensive LOTE programs available).
102.	Icosagram BT: Stars (Polygons)	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and Maths Thesaurus.	Maths 2 PM indicated subject term not required. AC queried the level of specificity and whether it could be a USE.	Agreed with recommendation and removed from ScOT.
103.	Icosahedrons BT: Polyhedra	Required for Mathematics and Numeracy 2 Project.	Maths 2 PM queried RT Equilateral triangles.	Agreed with recommendation and removed RT Equilateral triangles.

	RT: Equilateral triangles	Source: Maths Thesaurus and MathWorld.		Initially placed as RT as thought it would be a useful cross reference. Sourced from MathWorld. Icosahedrons BT: Polyhedra
104.	Ideograms BT: Symbols RT: Logographic writing systems	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC queried the level of specificity.	Required for LOTE 1 as part of the concepts covered in some of the LO (i.e. fundamental principles of Chinese character sets).
105.	Integer pairs BT: Integers	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus and MathWorld.	AC queried the level of specificity.	Agreed with recommendation and removed from ScOT.
106.	Intellect BT: Psychology NT: Imagination Logic Memory RT: Intelligence Thinking	Amended existing subject term. Added BT Psychology. Source: LCSH, FAMILY and ATED.		
107.	Interchanges BT: Buildings (Structures) RT: Public transport Railway stations Transport networks	Required for Mathematics and Numeracy 2 Project. Source: LCSH and ARRB.	Maths 2 PM indicated subject term not required. AC queried the level of specificity.	Included as part of Journey planner series of LO whereby students have to map out the quickest way to get between two points using trains and buses. Retained but will seek further advice from MA from an indexing perspective.
108.	Intersecting lines BT: Lines	Required for Mathematics and Numeracy 2 Project.		

	RT: Points	Source: MathWorld.		
109.	Irregular polygons BT: Polygons	Amended existing subject term. Source: MathWorld.		
110.	Japanese alphabet UF: Nihongo BT: Logographic writing systems NT: Kanji Romaji RT: Japanese language Katakana	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com) and LCSH.		
111.	Japanese hiragana BT: Syllabaries RT: Japanese language Katakana	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC queried the level of specificity.	Concepts covered in LOTE 1. Retained.
112.	Johnson solids BT: Polyhedra	Required for Mathematics and Numeracy 2 Project. Source: MathWorld.	Maths 2 PM indicated subject term not required.	Retained as allows for future expansion of examples of Johnson solids if required. Advice was sought from teacher librarians via the OZ_TL list and the ScOT consultative group (who also passed this information onto various curricula experts). The general consensus was that specific examples of Johnson solids were not taught in mathematics even in Year 12 except in cases where "extra" study was encouraged. Positive feedback was received from

				several teacher librarians who stated that they would refer to the MathWorld website.
113.	Jordan curves BT: Curves	Required for Mathematics and Numeracy 2 Project. Source: MathWorld.	Maths 2 PM indicated subject term not required.	Agreed with recommendation and removed from ScOT.
114.	Kanji BT: Japanese alphabet	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		
115.	Karnaugh maps BT: Mathematical concepts RT: Boolean algebra Logic	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and www.maxmon.com website.		
116.	Katakana BT: Syllabaries RT: Japanese alphabet Japanese hiragana Japanese language	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		
117.	Khmer alphabet BT: Syllabic alphabets RT: Khmer language	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		
118.	Latin alphabet BT: Alphabets NT: Modern latin alphabet RT: Albanian language Czech language	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		

	Dutch language English language Esperanto Estonian language Filipino language French language German language Hungarian language Indonesian language Italian language Latin literature Polish language Spanish language Turkish language Vietnamese language			
119.	Left falling strokes BT: Character strokes	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC queried the level of specificity and whether this subject term should be a USE	Required for LOTE 1 content.
120.	Lexicology BT: History NT: Vocabulary RT: Words	Amended existing subject term in response to feedback on coverage of LOTE 1 concepts. Added BT History and NT Vocabulary. Source: Omniglot website (www.omniglot.com) and LCSH.		
121.	Logograms BT: Symbols RT: Logographic writing systems	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		
122.	Logographic writing systems BT: Writing systems	Developed in response to feedback on coverage of LOTE 1 concepts.	AC queried the level of specificity.	Required for LOTE LO.

	NT: Chinese alphabet Hieroglyphics Japanese alphabet Pictographs Vietnamese alphabet RT: Ideograms Logograms Semantic phonetic compounds	Source: Omniglot website www.omniglot.com		
123.	Memory BT: Intellect RT: Thinking	Required for Mathematics and Numeracy 2 Project		
124.	Mercator projection BT: Map projection RT: Navigation	Required for Mathematics and Numeracy 2 Project. Cited in curricula. Sourced from MathWorld.	Maths 2 PM indicated subject term not required. AC queried the level of specificity.	Agreed with recommendation and removed from ScOT.
125.	Messaging UF: SMS Text messaging BT: Telecommunication systems RT: Mobile phones	Required for Mathematics and Numeracy 2 Project. Source: LCSH.		
126.	Millilitres BT: Capacity units	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and LCSH.		
127.	Minima BT: Numbers	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and Maths Thesaurus.	AC queried whether Points could be added as a RT or BT?	Agreed with recommendation. Added Points as RT. Minima BT: Numbers

				RT: Points
128.	Modern Latin alphabet BT: Latin alphabet NT: Ligatures	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC queried the need for NT Ligatures.	Required for LOTE LO. Following further review added Pi characters as NT. Modern Latin alphabet BT: Latin alphabet NT: Ligatures NT: Pi characters
129.	Multiples BT: Integers RT: Factors	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and LCSH.		
130.	Nets BT: Shapes (Geometry) RT: Solids (Mathematics)	Required for Mathematics and Numeracy 2 Project,. Source: MathWorld.	AC queried whether Nets should be Webs.	Established Webs as a UF under Nets. Nets UF: Webs BT: Shapes (Geometry) RT: Solids (Mathematics)
131.	Network diagrams BT: Diagrams RT: Maps	Required for Mathematics and Numeracy 2 Project.		
132.	Nihongo USE: Japanese alphabet	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		

133.	Nomograms UF: Nomographs BT: Charts	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and Maths Thesaurus. See also below.	Maths 2 PM indicated subject term not required. AC queried the level of specificity.	Agreed with recommendation and removed from ScOT.
134.	Nomographs USE: Nomograms	Required for Mathematics and Numeracy 2 Project	Maths 2 PM indicated subject term not required.	Agreed with recommendation and removed from ScOT.
135.	Nonagrams BT: Stars (Polygons)	Required for Mathematics and Numeracy 2 Project. Source: MathWorld.		
136.	Number sentences BT: Sentences RT: Mathematical notation Numbers	Required for Mathematics and Numeracy 2 Project. Source: MathWorld.	Maths 2 PM recommended that Algebra be added as a BT.	Agreed with recommendation. Added Algebra as BT. Number sentences BT: Algebra BT: Sentences RT: Mathematical notation Numbers
137.	Oblique prisms BT: Prisms	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and Maths Thesaurus.	Maths 2 PM indicated subject term not required.	Agreed with recommendation and removed from ScOT.
138.	Octohedrons BT: Polyhedra	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and Maths Thesaurus.		
139.	Octominos BT: Polyminos	Required for Mathematics and Numeracy 2 Project.	Maths 2 PM indicated subject term not required.	Agreed with recommendation and removed from ScOT.

		Source: MathWorld and Maths Thesaurus.	AC queried the level of specificity.	
140.	Open curves BT: Curves	Required for Mathematics and Numeracy 2 Project	AC queried the level of specificity.	Agreed with recommendation and removed from ScOT.
141.	Ordinal data BT: Data	Required for Mathematics and Numeracy 2 Project Source: MathWorld and Maths Thesaurus.		
142.	Ordinal names BT: Names	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and Maths Thesaurus.	Maths 2 PM recommended that Numerals be added as a BT. AC queried the level of specificity.	Agreed with recommendation. Added Numbers as BT. Ordinal names BT: Numbers BT: Names
143.	Paper products BT: Paper NT: Envelopes Stationery	Required for Mathematics and Numeracy 2 Project. Source: LCSH.		
144.	Pentagrams BT: Stars (Polygons)	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and Maths Thesaurus.	Maths 2 PM indicated subject term not required. AC queried as to whether Polygon stars could be added as a USE rather than Pentagrams.	Agreed with recommendation and removed from ScOT.
145.	Pentominos BT: Polyminos	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and Maths Thesaurus.	AC queried the level of specificity.	Agreed with recommendation and removed from ScOT.
146.	Perpendicular bisectors	Required for Mathematics and	AC queried the level of specificity.	Agreed with recommendation and

	BT: Bisectors	Numeracy 2 Project. Source: MathWorld and Maths Thesaurus.		removed from ScOT.
147.	Phonemic alphabets USE: Alphabets	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		
148.	Pictographs BT: Pictographs	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC queried the level of specificity.	Required for LOTE 1 LO
149.	Pictographs BT: Logographic writing systems NT: Pictographs RT: Hieroglyphics	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC queried the level of specificity.	Required for LOTE 1 LO
150.	Pink BT: Tertiary colours	Required for Mathematics and Numeracy 2 Project. Source: LCSH.	AC queried the level of specificity.	Agreed with recommendation and removed from ScOT.
151.	Pinyin BT: Chinese languages	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		
152.	Plane figures USE: Shapes (Geometry)	Amended existing subject term. Required for Mathematics and Numeracy 2 Project.		
153.	Plane shapes USE: Shapes (Geometry)	Amended existing subject term. Required for Mathematics and Numeracy 2 Project.		
154.	Planning	Amended existing subject term.		

	BT: Management NT: Business forecasting Business plans Financial planning Regional planning RT: Development	Required for Mathematics and Numeracy 2 Project.		
155.	Platonic solids BT: Polyhedra	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and Maths Thesaurus.	AC queried the level of specificity.	Retained as concepts covered in several Maths 2 LO.
156.	Polygons BT: Shapes (Geometry) NT: Concave polygons Convex polygons Decagons Dodecagons Heptagons Hexagons Irregular polygons Nonagons Octagons Pentagons Polyminos Quadrilaterals Regular polygons Stars (Polygons) Triangles (Shapes) RT: Polyhedra Tangrams	Amended existing subject term. Required for Mathematics and Numeracy 2 Project.		

	Tessellations			
157.	<p>Polyminos</p> <p>BT: Polygons</p> <p>NT: Heptominos</p> <p>Hexominos</p> <p>Octominos</p> <p>Pentominos</p> <p>Tetrominos</p>	<p>Required for Mathematics and Numeracy 2 Project.</p> <p>Source: Maths Thesaurus.</p>	<p>Maths 2 PM indicated subject term not required.</p> <p>AC queried the level of specificity.</p>	<p>Agreed with recommendation and removed all NT.</p> <p>Polyminos</p> <p>BT: Polygons</p>
158.	<p>Polynomial curves</p> <p>BT: Curves</p> <p>RT: Polynomials</p>	<p>Required for Mathematics and Numeracy 2 Project.</p> <p>Source: MathWorld.</p>	<p>Maths 2 PM indicated that concept is too specific and could probably be deleted.</p>	<p>Agreed with recommendation and removed from ScOT.</p>
159.	<p>Pre paid mobile plans</p> <p>BT: Charts</p> <p>RT: Mobile phones</p>	<p>Required for Mathematics and Numeracy 2 Project.</p>	<p>AC queried the level of specificity.</p> <p>Compound subject term.</p> <p>NW queried if this was a curricula term.</p>	<p>Following further consideration it is recommended to retain this subject term. The LO relating to mobile phones and call plans require the students to make comparisons between prepaid and contract plans based on a number of criteria. It is argued that the LO is not about pre paid plans per se but rather they are a significant component of the LO.</p> <p>Agree that subject term is a compound but argue that phrase is well known and cited in LO. See <i>Specifications</i> 4.8.1.1</p> <p>Following further discussion by the ScOTMG it was agreed that this concept should be deleted from ScOT. If necessary the concept could be covered in the keyword section of the metadata.</p>

				Recommendation Delete subject term from ScOT.
160.	Programming USE: Computer programming	Required for Mathematics and Numeracy 2 Project.		
161.	Puzzles BT: Games NT: Tangrams	Required for Mathematics and Numeracy 2 Project. Source: LCSH.		
162.	Quadratic surds BT: Rational numbers	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus and MathWorld.	Maths 2 PM indicated subject term not required.	Agreed with recommendation and removed from ScOT.
163.	Rail transport UF: Railways BT: Transport NT: Railway lines RT: Public transport Railway stations Trains Trams	Amended existing subject term by adding RT Railway stations.		
164.	Railway stations BT: Buildings (Structures) RT: Interchanges Rail transport Railway lines	Required for Mathematics and Numeracy 2 Project		
165.	Range	Required for Mathematics and Numeracy 2 Project.	AC reported that further advice is required for this subject term.	Agreed with recommendation. Removed from ScOT as not required for

	BT: Statistics	Source: MathWorld and Maths Thesaurus.		any of the LO for Maths 2 however further work will be done on this concept.
166.	Range bar graphs BT: Bar charts	Required for Mathematics and Numeracy 2 Project.	Maths 2 PM indicated subject term not required.	Agreed with recommendations and removed from ScOT.
167.	Regular polygons BT: Polygons	Required for Mathematics and Numeracy 2 Project		
168.	Remainder theorems BT: Mathematical formulas RT: Polynomials	Required for Mathematics and Numeracy 2 Project	Maths 2 PM indicated subject term not required as not covered at all in Maths 2.	Agreed with recommendations and removed from ScOT.
169.	Right falling strokes BT: Character strokes	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC queried the specificity and whether it could become a USE.	Required for LOTE 1
170.	Right prisms BT: Prisms	Required for Mathematics and Numeracy 2 Project.		
171.	Rising strokes BT: Character strokes	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		
172.	Robots BT: Robotics	Required for Mathematics and Numeracy 2 Project Source: LCSH.		
173.	Rock samples BT: Rocks RT: Geology	Required for Mathematics and Numeracy 2 Project. Source: LCSH.	AC queried if this was a compound term.	Yes however it is a common phrase used in the curricula and other literature. Required for a series of LO which feature a robot on a planet

				obtaining rock samples.
174.	Romaji BT: Japanese alphabet	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		
175.	Scatter diagrams USE: Scatter graphs	Required for Mathematics and Numeracy 2 Project. Cited extensively in the curricula.		
176.	Semantic phonetic compounds BT: Symbols RT: Logographic writing systems	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC disagreed with this subject term.	Required for LOTE 1.
177.	Septagons USE: Heptagons	Required for Mathematics and Numeracy 2 Project Source: MathWorld and Maths Thesaurus.		
178.	Shapes (Geometry) UF: Plane figures Plane shapes Two dimensional shapes BT: Geometric concepts NT: Bases (Mathematics) Circles Congruent figures Crescents Fractals Nets Polygons RT: Golden ratios Patterns	Amended existing subject term. Source: MathWorld, Maths Thesaurus and LCSH.		

179.	Side elevation BT: Perspective (Visual arts)	Required for Mathematics and Numeracy 2 Project. Source: Art and Architecture Thesaurus.		
180.	Simple closed curves BT: Closed curves	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and Maths Thesaurus.		
181.	Simplified Chinese BT: Chinese alphabet	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		
182.	Skeleton maps BT: Maps	Required for Mathematics and Numeracy 2 Project.	Maths 2 PM indicated subject term not required.	Agreed with recommendation and removed from ScOT.
183.	Sketch graphs BT: Graphs	Required for Mathematics and Numeracy 2 Project	Maths 2 PM indicated subject term not required as not relevant to Maths 2.	Agreed with recommendations and removed from ScOT.
184.	SMS USE: Messaging	Required for Mathematics and Numeracy 2 Project. Source: LCSH.		
185.	Snub nosed polyhedra BT: Polyhedra	Required for Mathematics and Numeracy 2 Project. Source: MathWorld.		
186.	Spherical triangles BT: Spheres RT: Arcs Triangles (Shapes)	Required for Mathematics and Numeracy 2 Project. Source: Maths Thesaurus.		

187.	<p>Sport</p> <ul style="list-style-type: none"> BT: Recreation NT: Aquatics NT: Athletes NT: Athletics NT: Cricket (Sport) NT: Cycling NT: Extreme sports NT: Hockey NT: Sailing NT: Skateboarding NT: Skiing NT: Sporting culture NT: Sports administration NT: Sports equipment NT: Sports medicine NT: Sports psychology NT: Surfing NT: Tenpin bowling NT: Triathlons RT: Competition (Psychology) RT: Fair play RT: Games RT: Human movement RT: Performance RT: Rules RT: Sporting venues RT: Sports articles RT: Training 	Amended existing subject term. Added Triathlons as a NT.		
188.	Spirals	Required for Mathematics and	Maths 2 PM indicated subject term not	Agreed with recommendations and

	BT: Curves	Numeracy 2 Project. Source: Maths Thesaurus and MathWorld.	required.	removed from ScOT.
189.	Spread BT: Statistics	Required for Mathematics and Numeracy 2 Project	See also comments under Range. AC queried the need for this subject term.	See comments under Range.
190.	Square numbers USE: Perfect squares	Required for Mathematics and Numeracy 2 Project. Source: MathWorld.		
191.	Squares (Indices) BT: Indices Mathematical concepts NT: Difference of squares Perfect squares	Amended qualifier based on feedback from TLF. Existing subject term.		
192.	Stars (Polygons) BT: Polygons NT: Decagram Heptagram Icosagram Nonagram Pentagram	Required for Mathematics and Numeracy 2 Project. Source: MathWorld.	Maths 2 PM indicated that all NT could probably be deleted as they are too specific. AC preferred Polygon stars.	Agreed with recommendation and removed all NT. Prefer Star polygon as this is the most common example. Star polygons BT: Polygons
193.	Stars (Universe) UF: Constellations Sidereal system BT: Galaxies NT: Black holes Dwarf stars	Added qualifier as homograph Stars (Polygons) added. Deleted NT Oriun, Sirius and Southern Cross as all proper names.		

	Nebulae Pulsars Red giants Sun RT: Astronomy Celestial objects Solar system			
194.	Stationery BT: Paper products	Required for Mathematics and Numeracy 2 Project. Source: LCSH.		
195.	Street directories BT: Maps	Required for Mathematics and Numeracy 2 Project. Source: LCSH.		
196.	Strip graphs BT: Graphs	Required for Mathematics and Numeracy 2 Project	AC queried the specificity of the subject terms.	Agreed with recommendation and removed from ScOT.
197.	Swamp ecology USE: Wetland ecology	Corrected error identified by NZ Science Subject Terms Project team.		
198.	Syllabic alphabets UF: Alphasyllabaries BT: Writing systems NT: Khmer alphabet Thai alphabet Tibetan alphabet	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC queried the specificity of this subject term.	Required for LOTE 1.
199.	Syllables BT: Speech	Developed in response to feedback on coverage of LOTE 1 concepts.	AC queried NT Homophones.	Agreed with recommendation. Changed to RT and added BT Words

	Writing NT: Homophones RT: Letters (Writing)	Source: Omniglot website (www.omniglot.com) and LCSH.		Syllables BT: Speech Writing RT: Letters (Writing) RT: Homophones Homophones BT: Words RT: Syllables
200.	Syllogism BT: Logic RT: Mathematics	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC queried the specificity and definition of this subject term.	Agreed with recommendation and removed from ScOT.
201.	Symbolic numbers BT: Numbers	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and Maths Thesaurus.	Maths 2 PM indicated subject term not required. AC queried the specificity of this subject term.	Agreed with recommendation and removed from ScOT.
202.	Tally charts BT: Tables	Required for Mathematics and Numeracy 2 Project. Source: NZ curricula for definition.		
203.	Tangrams BT: Puzzles RT: Polygons	Required for Mathematics and Numeracy 2 Project. Source: LCSH.		
204.	Telecommunication systems BT: Telecommunications NT: Email Facsimile transmission Messaging	Amended existing subject term. Source: LCSH.	AC queried whether Telephones should be added to this reference structure.	Agree with recommendations. Added Telephones as NT Telecommunication systems BT: Telecommunications

				NT: Email Facsimile transmission Messaging Telephones
205.	Telegraph lines BT: Electric wires Telecommunications	Amended existing subject term by adding BT Electric wires and Telecommunications. Deleted NT Overland Telegraph Line (proper name). Source: LCSH.		
206.	Tetrahedrons BT: Polyhedra	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and Maths Thesaurus.		
207.	Tetrominos BT: Polyminos	Required for Mathematics and Numeracy 2 Project. Source: MathWorld.	Maths 2 PM indicated subject term not required. AC queried the specificity of this subject term.	Agreed with recommendations and removed from ScOT.
208.	Text messaging USE: Messaging	Required for Mathematics and Numeracy 2 Project. Source: LCSH.		
209.	Thai alphabet BT: Syllabic alphabets RT: Thai language	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC queried the reference structure.	Checked reference structure and the structure is correct.
210.	Thinking UF: Complex thinking Ideation BT: Intelligence NT: Analytical thinking Attention	Amended existing subject term.		

	<p>Convergent thinking Creative thinking Critical thinking Decision making Deductive thinking Divergent thinking Ideas Inductive thinking Judgment Lateral thinking Organisational thinking Procedural thinking Reasoning Stereotypes RT: Intellect Logic Memory Perception</p>			
211.	<p>Tibetan alphabet BT: Syllabic alphabets RT: Tibetan language</p>	<p>Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)</p>	<p>AC queried the specificity of these subject terms.</p>	<p>Required for LOTE 1 and brings all language subject terms into consistent pattern in ScOT.</p>
212.	<p>Tidal charts BT: Charts RT: Tides</p>	<p>Required for Mathematics and Numeracy 2 Project.</p>	<p>Maths 2 PM indicated subject term not required at this stage. There is a LO relating to pilot navigation that is to be built at some stage.</p>	<p>Agreed with recommendation and removed from ScOT.</p>
213.	<p>Time series data BT: Statistical data</p>	<p>Required for Mathematics and Numeracy 2 Project.</p>	<p>AC queried the specificity of these subject terms.</p>	<p>Required for LO in Maths 2.</p>

214.	Time zones BT: Time (Measurement)	Required for Mathematics and Numeracy 2 Project.		
215.	Tram routes BT: Public transport Transport networks RT: Trams	Required for Mathematics and Numeracy 2 Project		
216.	Travel UF: Trips BT: Social customs NT: Retail travel RT: Exploration	Amended existing subject term by adding UF Trips and BT Social customs.. Source: LCSH.	AC queried the need for NT Retail travel.	Agree that the subject term is very specific. Removed NT Retail travel from ScOT. Travel UF: Trips BT: Social customs RT: Exploration
217.	Triathletes BT: Athletes RT: Triathlons	Required for Mathematics and Numeracy 2 Project.		
218.	Triathlons BT: Sport RT: Triathletes	Required for Mathematics and Numeracy 2 Project.		
219.	Trips USE: Travel	Required for Mathematics and Numeracy 2 Project		
220.	True false questions BT: Questions	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and Maths Thesaurus.	AC queried the specificity of this subject term.	Agreed with recommendations and removed from ScOT.

221.	Truncated polyhedra BT: Polyhedra	Required for Mathematics and Numeracy 2 Project. Source: MathWorld and Maths Thesaurus.	AC queried the specificity of this subject term.	Agreed with recommendations and removed from ScOT.
222.	Turning strokes BT: Character strokes	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC queried the specificity of this subject term. Could this become a USE?	Required for LOTE .
223.	Two by two array BT: Tables	Required for Mathematics and Numeracy 2 Project	Maths 2 PM recommended that Arrays would be more appropriate.	Changed to Arrays Arrays BT: Tables
224.	Two dimensional animation USE: 2D animation	Required for Mathematics and Numeracy 2 Project		
225.	Vertical strokes BT: Character strokes	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)	AC queried the specificity of this subject term. Could this become a USE?	Required for LOTE.
226.	Vietnamese alphabet BT: Logographic writing systems RT: Vietnamese language	Developed in response to feedback on coverage of LOTE 1 concepts. Source: Omniglot website (www.omniglot.com)		
227.	Viewfinders BT: Cameras	Required for Mathematics and Numeracy 2 Project. Source: LCSH.		
228.	Vinegar USE: Acetic acids	Amended following feedback received from NZ Science Subject Terms Project team.		
229.	Vocabulary BT: Lexicology	Developed in response to feedback on coverage of LOTE 1 concepts.		

	RT: Languages Words	Source: LCSH.		
230.	Waka SN: Use for resources on traditional and historical Maori canoes. RT: Canoes Genealogy	Amended following feedback received from NZ Science Subject Terms Project team. Will seek further information from NZ. Note: This is now a top term – previously Canoes was a BT.	AC disagreed with the revised reference structure from NZ.	This issue will need to be referred back to New Zealand for further comment.
231.	Writing systems BT: Writing NT: Abjads Alphabets Logographic writing systems Syllabaries Syllabic alphabets RT: Languages	Developed in response to feedback on coverage of LOTE 1 concepts.	AC queried the need for the NT.	All NT required for LOTE

5 Sources

5.1 List

Apart from curricula documentation the following sources were primarily consulted.

- MathWorld [website] : the web's most extensive mathematical resource. URL: <http://mathworld.wolfram.com/>
- Omniglot [website] : a guide to writing systems. URL: www.omniglot.com
- Maths Thesaurus [website]. URL: <http://thesaurus.maths.org/mmkb/view.html>
- Library of Congress Subject Headings
- Medical Subject Headings [website]. URL: <http://www.nlm.nih.gov/mesh/meshhome.html>
- Art and Architecture Thesaurus [website]. URL: http://www.getty.edu/research/conducting_research/vocabularies/aat/
- SCIS Subject Headings. 5th edition. 2002.