

TEEJAY PUBLISHERS

Curriculum For Excellence - Mathematics (Apr '09)

THIRD LEVEL

An attempt to tie up - Curriculum for Excellence - 5 to 14 Strands - TeeJay Books E and General 3G/Int1 for the 3rd Level.

Curriculum for Excellence is about introducing a more modern approach to the delivery of a comprehensive mathematics education to pupils, a need for a change of emphasis in the teaching methodology (particularly in the Secondary Sector) and making children more accountable for what, how and when they learn the fundamentals of Mathematics and Arithmetic (Numeracy).

The basic order of the actual curriculum cannot really be altered since mathematics and numeracy are by their nature, sequential. The only possible changes occur either when a new topic is being introduced or a former one is dropped - or perhaps if a change in emphasis or depth is required.

Here, we attempt to help schools and teachers by tying up the curricular content of the new Curriculum for Excellence with that dictated by the former 5-14 strand checklist at level E and the early stages of Standard Grade/Intermediate 1. We will, where possible, suggest alternative approaches to the introduction of a topic, but that is generally down to the individual skills of the class teacher. The problem lies in the "vagueness" of the outcomes. For example :-

Having investigated a range of methods, I can accurately draw 2D shapes using appropriate mathematical instruments and methods. **MTH 322S**

Questions are "What shapes ? How complicated ? What instruments ? Which methods ?"

No answer is forthcoming in the document - Is it then up to the teacher to decide ? - Remember that Level 3 covers the 2 to 3 year period from S1 to S2/3 - Quite a range from which the teacher has to interpret both the content and the depth.

We will try to put our own slant on it and will detail as much as we can - but we will obviously update this as more information becomes available.

Remember :- TeeJay provides, as do most other publishers, simply a RESOURCE - not a COURSE.

** (2100 schools in Scotland, (out of 2500), now use our resources and/or textbooks)**.

Mathematics Framework

| CfE Level | Stage | 5-14 Level/Qualification | TeeJay Resources |
|-----------|--|---|--|
| Early | Pre school to P1 (or later ?) | (About $\frac{2}{3}$ of Level A) | Book A |
| First | P2 to P4 (or earlier/later ?) | (A) and B + $\frac{2}{3}$ of Level C | (Book A) Book B and $\frac{2}{3}$ of Book C |
| Second | P5 to P7 (or earlier/later ?) | (C) and D and Most (all) of E | (Book C) Book D and $\frac{2}{3}$ (all) of Book E |
| 3rd/4th | S1 to S3 (or earlier ?) The 4th level equates to SCQF* (Grade 4) i.e. Int1/General | (D & E) and some of Book F or E and New General (or equivalent to Intermediate 1) | Books D and E (Some/all of Book F) TeeJay's books G3 and G4 (or Int 1) Possibly a New "General" Textbook |
| Senior | S4 to S6 (and beyond) | New Advanced General Credit or Intermediate 2 Higher & Adv Higher | TeeJay's IC1 and IC2 TeeJay's Advanced Higher Notes (Possible New TeeJay Higher Book) |

* THE SCOTTISH CREDIT AND QUALIFICATIONS FRAMEWORK

| SCQF Level | SQA National Units, Courses and Group Awards | Higher Education | Scottish Vocational Qualifications |
|------------|--|--|------------------------------------|
| 12 | | Doctorates | |
| 11 | | Masters | **SVQ 5 |
| 10 | | Honours Degree *Graduate Diploma/Certificate | |
| 9 | | Ordinary Degree *Graduate Diploma/Certificate | |
| 8 | | Higher National Diploma Diploma of Higher Education | **SVQ 4 |
| 7 | Advanced Higher | Higher National Certificate Certificate of Higher Education | |
| 6 | Higher | | **SVQ 3 |
| 5 | Intermediate 2 Credit Standard Grade | | **SVQ 2 |
| 4 | Intermediate 1 General Standard Grade | | **SVQ 1 |
| 3 | Access 3 Foundation Standard Grade | | |
| 2 | Access 2 | | |
| 1 | Access 1 | | |

*These qualifications are differentiated by volume of outcomes and may be offered at either level.
****Scottish Vocational Qualifications (SVQs)** are currently being credit-rated.
 The results are available on www.scaf.org.uk and www.sqa.org.uk.

THIRD LEVEL

S1 - S2(/3)

Mid-Level E to Early General/Int 1

The following 6 pages, (pages 4 - 9, give a detailed outline of how we, at TeeJay Publishers, think the **curricular content** of the new Curriculum for Excellence can be covered using the 5 - 14 National Guidelines Document and the S-Grade/Intermediate checklist in conjunction with TeeJay's 5-14 Maths Textbook E and 3G/4G, Intermediate 1 and in some cases, Textbook Level F.

The following points should be noted :-

- Our Textbooks provide what we believe to be a sound and imaginative set of Resources - (*not a Course*) - it is not a scheme of work, rather they support and enhance the work done in class, developed in the school by the practising class teacher.
- The Third Level stretches from S1 to S2/3, so this is our interpretation of the depth and pace of the course. It is difficult, without greater details, to accurately predict how much and how far into a topic a teacher should take a class, but we have attempted to do so.
- We have studied the curricular content closely, as outlined in the 5-14 document and the S-Grade/Int 1 checklists, and in nearly every case we discovered there to be a fairly close correlation between what is required for CfE and what is present in the older courses, (*and in our own resources*).
- Hence, schools should not, (*and in the present economic situation cannot*), be expected to consider purchasing a new set of resources when, (as 2100 schools will agree), the Teejay Textbooks and the Homework, Assessments, Consolidation/Revision and Mental photocopiable resources already provide a more than adequate solution.
- We do not expect you to use a mixture of Books E/F, 3G/4G or Int 1 just to follow a particular order. This is unwieldy and unworkable. Rather, you should continue to use Level E, then 3G/4G, Book F or Intermediate 1 - that was the very reason TeeJay produced the books, (*to follow a particular Level/Course in its entirety*).
- In the few instances where a new topic is being introduced, (e.g. in the development of use of bank cards and budgeting) TeeJay will develop the topic, (possibly as a set of free downloadable photocopy sheets), or will try to source an alternative set of suitable resources.
- When the details are forthcoming regarding the new General and Advanced General, we will produce new guidelines to successfully complete the courses using our existing resources.
- Only if these new courses are vastly different from our existing 3G/4G/Intermediate 1/Intermediate 2 courses will we consider producing new textbooks, at which time we will consult, listen to and act upon what you, as PT's, want us to write.

We hope the details below are of use to Principal Teachers in their course planning and to class teachers in their implementation of the new Curriculum for Excellence at the Third Level.

Third Level

(P7 - S1(/2))

(End of Level E, plus Some of General/Int 1

*** This is **NOT** meant as any form of course outline. It is simply an attempt to show that, by continuing to follow the (curricular) content and the order of 5 to 14, (preferably using TeeJay's Level E/F), and some of TeeJay's 3G/4G/Int 1, schools will have also covered the curricular content of the 3rd level of Curriculum for Excellence.

Number, Money and Measure

| | Curriculum for Excellence Outcomes | 5-14 equivalent (Level E) | TeeJay Book 3G/4G | TeeJay Intermediate 1 | TeeJay F** |
|---|--|--|--|---|--|
| Estimating & Rounding | I can round a number using an appropriate degree of accuracy, having taken into account the context of the problem. MNU 3-01A | Round any number to 1 decimal place and using this to check calculations of the form :- $7 \cdot 253 + 8 \cdot 174$ is about $7 \cdot 3 + 8 \cdot 2 = \dots$ | Ch 1 Rounding Numbers Ch 3 Rounding to 1 & 2 dec places | Ch 1 Rounding pages 5 - 11 | Ch 13 Decimals, Decimal Places & Sig. Figs (64 - 66) |
| Number and Number Processes including Addition Subtraction Multiplication & Division and Negative Numbers | I can use a variety of methods to solve number problems in familiar contexts, clearly communicating my processes and solutions. MNU 3-03a | Simple addition and subtraction of positive and negative numbers in applications such as temperature and banking work | Ch 1 Mult/Div by 10, 100, 1000 Ch 3 Read Decimal scales Add & Subtract Decimals Mult/Div decimals by single digit Mult/Div by 10, 100, 1000 Ch 6 Wages & Salaries Ch 8 Money A Simple Interest & Bills Ch 15 Money B - Profit & Loss, H P, Insurance and Foreign Exchange | Ch 8 Social Arithmetic Wages & Salaries & Overtime Hire Purchase Insurance Foreign Exchange | Ch 13 Decimals, (58 - 63) |
| | I can continue to recall number facts quickly and use them accurately when making calculations. MNU 3-03b | All above in solving problems in context in applications in number measurement & money | Ch 1 Mult/Div whole no's by 20, 300, 4000 | | |
| | I can use my understanding of numbers less than zero to solve simple problems in context. MNU 3-04a | Work with negative numbers in application (e.g. temperature, dates, banking) | Ch 1 Handle simple negatives in context Add/Subtract using a thermometer Coordinates in all 4 quadrants | Ch 9 Integers (80 - 91) | Ch 02 Integers, (9 - 19) |

| | Curriculum for Excellence Outcomes | 5-14 equivalent (Level E) | TeeJay Book 3G/4G | TeeJay Intermediate 1 | TeeJay F ** | |
|--|---|--|--|--------------------------------|---|---------------------------|
| Multiples Factors & Primes | I have investigated strategies for identifying common multiples and common factors, explaining my ideas to others, and can apply my understanding to solve related problems. MTH 3-05a | Multiples, Ch 13 Multiples | | | Ch 5 Multiples, and LCM | |
| | I can apply my understanding of factors to investigate and identify when a number is prime. MTH 3-05b | Factors and Prime Numbers Ch 13 Factors & Primes | | | Ch 5 Factors, and HCF Prime No's | |
| Powers & Roots | Having explored the notation and vocabulary associated with whole number powers and the advantages of writing numbers in this form, I can evaluate powers of whole numbers mentally or using technology. MTH 3-06a | | Ch 13 Squares and Square Roots Ch 4 Indexes (Powers) | | | |
| Fractions Decimals & Percentages including Ratio and Proportion | I can solve problems by carrying out calculations with a wide range of fractions, decimal fractions and percentages, using my answers to make comparisons and informed choices for real life situations. MNU 3-07a | Decimals to 3 places (practical applications in measurement) | Ch 3 Decimals Ch 4 Percentages Ch 11 Fractions Ch 8 Money A Simple Interest & Bills Ch 15 Money B - Profit & Loss, H P, Insurance and Foreign Exchange | Ch 2 Percentages (12 - 21) | Ch 13 Decimals (56 - 63) Ch 19 %ages (92-100) Ch 31 Fractions (128-130) | |
| | By applying my knowledge of equivalent fractions and common multiples, I can add and subtract commonly used fractions. MTH 3-07b | All widely used fractions and equivalence among these and decimals (in applications). Be able to find <u>mentally</u> widely used fractions and percentages of whole number quantities. (75% of £120 = 3/4 of £120 =) With a calculator, find any percentage of a quantity, rounding where needed. | | Ch 11 Fractions EXTENSION UNIT | | Ch 31 Fractions (131-136) |
| | Having used practical, pictorial and written methods to develop my understanding, I can convert between whole or mixed numbers and fractions. MTH 3-07c | Simplifying fractions and percentages like (6/8, 15/20, 80/100, 45%, 90%) and using this to calculate (<u>mentally</u>) fractions & percentages of quantities. | | Ch 11 Fractions EXTENSION UNIT | | Ch 31 Fractions (128-130) |

| | Curriculum for Excellence Outcomes | 5-14 equivalent (Level E) | TeeJay Book 3G/4G | TeeJay Intermediate 1 | TeeJay F ** |
|--|--|---|--|--|---------------------------|
| Fractions Decimals & Percentages including Ratio and Proportion (cont'd) | I can show how quantities that are related can be increased or decreased proportionally and apply this to solve problems in everyday contexts. MNU 3-08a | Find Ratios between quantities Use simple Unitary Ratios Chapter 15 - Ratios | Ch 02 Proportion Ch 11 Ratios | Ch 3 Direct Proportion (22 - 24) | Ch 41 Ratios (157-170) |
| Money | When considering how to spend my money, I can source, compare and contrast different contracts and services, discuss their advantages and disadvantages and explain which offer best value to me. MNU 3-09a | | The concept of Budgeting and using bank cards to be developed from TeeJay Level F and Int-2-Credit Bks 1 and 2 for use, in simplified form, by those tackling MNU 312K . Will be posted on our web-site later. | The concept of Budgeting and using bank cards to be developed from TeeJay Level F and Int-2-Credit Bks 1 and 2 for use, in simplified form, by those tackling MNU 312K . Will be posted on our web-site later. | |
| | I can budget effectively, making use of technology and other methods, to manage money and plan for future expenses. MNU 3-09b | | The concept of Budgeting and using bank cards to be developed from TeeJay Level F and Int-2-Credit Bks 1 and 2 for use, in simplified form, by those tackling MNU 313K . Will be posted on our web-site later. | The concept of Budgeting and using bank cards to be developed from TeeJay Level F and Int-2-Credit Bks 1 and 2 for use, in simplified form, by those tackling MNU 313K . Will be posted on our web-site later. | |
| Time | Using simple time periods, I can work out how long a journey will take, the speed travelled at or distance covered, using my knowledge of the link between time, speed and distance. MNU 3-10a | Time activities in seconds using a digital stopwatch in seconds, tenths and hundredths of a second E - Chapter 3 pages(46 - 48) | Ch 10 Time/Distance/Speed Extension Ch 10 - Further TDS | Ch 10 Speed/Dist/Time (92 - 106) | Ch 47 T.D.S. (179-192) |
| Measurement | I can solve practical problems by applying my knowledge of measure, choosing the appropriate units and degree of accuracy for the task and using a formula to calculate area or volume when required. MNU 3-11a | Calculate using rules areas of rectangles and squares. Calculate volumes of cubes and cuboids using rules. E - Chapter 10, 16 (125 - 131), (183-193) | | Ch 05 Areas (32 - 37) Ch 06 Volumes (45 - 50) | |
| | Having investigated different routes to a solution, I can find the area of compound 2D shapes and the volume of compound 3D objects, applying my knowledge to solve practical problems. MTH 3-11b | | Ch 14 Areas Pages 176 - 179 Extension Ch 14 Areas of 2D shapes Ch 08 Volumes 89 - 91 and 92 - 99 | Ch 05 Areas (40-41) Ch 06 Volumes (47-50) | Ch 23 Areas (101-117) |

| | | | | | |
|---|--|---|---|---|-----------------------------|
| Mathematics Impact on the world past, present and future | I have worked with others to research a famous mathematician and the work they are known for, or investigated a mathematical topic, and have prepared and delivered a short presentation. MTH 3-12a | | | | |
| Patterns & Relationships | Having explored number sequences, I can establish the set of numbers generated by a given rule and determine a rule for a given sequence, expressing it using appropriate notation. MTH 3-13a | Continue and describe sequences involving square and triangular numbers Find specific items in a sequence Understand prime numbers. Find rules to connect posts and rails :- E - Chapter 11 (132-145) | Ch 17 Patterns Pages 205 - 213 Extension Ch 17 Patterns continued. | | Ch 53 Patterns (193-201) |
| Expressions & Equations | I can collect algebraic terms, simplify expressions and evaluate using simple substitution. MTH 3-14a | Not mentioned in Level E but covered in Chapter 8 of Level E Book E - Chapter 8 pages (92-95) | Ch 07 Algebra Pages 85 - 87 | Ch 07 Expressions/Formulae (52 - 57) Ch 14 Algebra (156 - 161) | Ch 11 Algebra (46 - 55) |
| | Having discussed ways to express problems or statements using mathematical language, I can construct, and use appropriate methods to solve, a range of simple equations. MTH 3-15a | Use a function machine in reverse for inverse operations. Solve equations/inequations like :- $x - 4 = 7$, $2N + 3 = 9$, $x + 3 > 5$ E - Chapter 8 pages (96-98) | Ch 07 Algebra Pages 87 - 89 Extension Ch 7 Equations & Inequations | Ch 14 Algebra (162 - 165) | Ch 43 Equ/Inequ's (171-174) |
| | I can create and evaluate a simple formula representing information contained in a diagram, problem or statement. MTH 3-15b | Find relationships for 2 sets of numbers $N \longrightarrow 3N$ Describe rules to connect posts and rails E - Chapter 8 pages (93-95) | Ch 14 Formulae Pages 162 - 169 Extension Ch 14 Further Formulae | - | - |

Shape, Position & Movement

| | Curriculum for Excellence Outcomes | 5-14 equivalent (Level E) | TeeJay Book 3G/4G | TeeJay Intermediate 1 | TeeJay F ** |
|---|--|--|--|-----------------------|----------------------------------|
| Properties of 2D Shapes and 3D Objects | Having investigated a range of methods, I can accurately draw 2D shapes using appropriate mathematical instruments and methods. MTH 3-16a | Given 3 sides, two sides and included angle or two angles and a side, be able to draw triangles. E - Chapter 14, 20 (168-174), (234-240) | Ch 02 Angles Pages 22 - 23 Drawing Triangles | - | Ch 37 Drawing Skills (144-149) |
| Angle, Symmetry and Transformation | I can name angles and find their sizes using my knowledge of the properties of a range of 2D shapes and the angle properties associated with intersecting and parallel lines. MTH 3-17a | Use reflex to describe angles. (Understand vertically opposite angles and that they are equal) - Level 3 ? (Use the properties of angles formed by a line crossing parallel lines - Level 3 (Know the sum of the 3 angles of any triangle is 2 right angles (180°))- Level 3 E - Chapter 12 (146-161) | Ch 02 Angles Pages 15 - 17 Extension Ch 02 Further Angles | - | Ch 03 Angles (20 - 22) |
| | Having investigated navigation in the world, I can apply my understanding of bearings and scale to interpret maps and plans and create accurate plans, and scale drawings of routes and journeys. MTH 3-17b | Understand and use bearings in drawings E - Chapter 17 (194-207) | Ch 05 Scales/Enlargement Pge 52 - 63 Extension Ch 05 Scales | - | Ch 37 Drawing Skills (150-155) |
| | I can apply my understanding of scale when enlarging or reducing pictures and shapes, using different methods, including technology. MTH 3-17c | | Ch 05 Scales/Enlargement Pge 50 - 51 | - | Ch 37 Drawing Skills (141 - 143) |
| | I can use my knowledge of the co-ordinate system to plot and describe the location of a point on a grid. MTH 3-18a | Use coordinates to plot points in all 4 quadrants :- (-2, 5), (3, -2) ... Calculate distances along grid lines. E - Chapter 6 (63-65) | - | - | - |
| | I can illustrate the lines of symmetry for a range of 2D shapes and apply my understanding to create and complete symmetrical pictures and patterns. MTH 3-19a | (Determine whether or not a shape has rotational symmetry).* (Level 4) Move a tile or shape on a squared grid in order to translate, reflect or rotate the shape.* (Not mentioned in outcomes). E - Chapter 7 (79-81), +(82-91)* | Ch 03 Symmetry Pge 33 - 41 | - | - |

Information Handling

Curriculum for Excellence Outcomes

5-14 equivalent (Level E)

TeeJay Book 3G/4G

TeeJay Intermediate 1

TeeJay F **

| | Curriculum for Excellence Outcomes | 5-14 equivalent (Level E) | TeeJay Book 3G/4G | TeeJay Intermediate 1 | TeeJay F ** |
|--|--|--|---|--|----------------------------|
| Data & Analysis | I can work collaboratively, making appropriate use of technology, to source information presented in a range of ways, interpret what it conveys and discuss whether I believe the information to be robust, vague or misleading. MNU 3-20a | Can interpret from an extended range of displays, (diagrams, tables, graphs, pie charts) and databases retrieving info subject to more than 1 condition. (e.g. "Which children are taller than 130 cm and heavier than 40 kg). Describe the main features of a graph to show awareness of the significance of the information. (e.g. given graph of water level in harbour, say what's happening). E - Chapter 9 (108-117) | Ch 12 Statistics Pge 132 - 144 Extension Ch 12 Graphs/Charts (53 - 59) | Ch 12 Graphs/Charts/Tables Pages(121-134) | Ch 17 Statistics (73 - 86) |
| | When analysing information or collecting data of my own, I can use my understanding of how bias may arise and how sample size can affect precision, to ensure that the data allows for fair conclusions to be drawn. MTH 3-20b | To be developed or sourced | To be further developed or resourced Ch 12 Statistics Pge 144 - 146 Extension Ch 12 Graphs/Charts (59 - 63) | Ch 13 Using Statistics Pages (137-143) | Ch 17 Statistics (73 - 86) |
| | I can display data in a clear way using a suitable scale, by choosing appropriately from an extended range of tables, charts, diagrams and graphs, making effective use of technology. MTH 3-21a | Construct straight line and curved graphs for continuous data where there is a relationship such as direct proportion - travel, temperature, growth graphs. Construct a pie chart where data is given in percentages. Use a computer package where possible. E - Chapter 9 (108-117) | Ch 12 Statistics Pge 132 - 143 | Ch 12 Graphs/Charts/Tables Pages(121-134) | Ch 17 Statistics (81 - 86) |
| Ideas of Chance & Probability | I can find the probability of a simple event happening and explain why the consequences of the event, as well as its probability, should be considered when making choices. MNU 3-22a | Not mentioned in Level E | Ch 18 Probability Pge 214 - 217 | Ch 13 Using Statistics Probability (143-146) | Ch 17 Statistics (87 - 88) |