

## Comparison of the Revised Junior Secondary Mathematics Curriculum Content and the Current Junior Secondary Mathematics Curriculum Content

| Learning Unit of Current Curriculum (1999)       | Major revision |     |                     | Learning Unit of Revised Curriculum (Implemented in September 2020) | Notes about revision (LU: Learning Unit LO: Learning Objective)   |
|--|----------------|-----|---------------------|---|---|
|  | Delete         | Add | Reorganise / Adjust |   |   |
| <b>Number and Algebra Strand</b>                 |                |     |                     |   |   |
| (no corresponding LU)                            |                | ✓   |                     | 1. Basic computation  | A new LU.   |
| Numerical Estimation<br>Approximation and Errors | ✓              |     | ✓                   | 3. Approximate values and numerical estimation                      | Only the curriculum content on estimating numbers by rounding off, rounding up and rounding down were retained. The content on designing numerical estimation strategies according to the contexts and judging the reasonableness of the results obtained was revised as an Enrichment Topic. |
|  |                |     | ✓                   |   | The two LUs were combined into one LU.  |
|  |                |     | ✓                   |   | The curriculum content on scientific notation was moved to LU 10 “Laws of integral indices”.  |
| Rational and irrational numbers                  |                | ✓   |                     | 4. Rational and irrational numbers                                  | The curriculum content on the concept of $n$ th root was moved from the Compulsory Part of senior secondary to this LU.   |
|  |                | ✓   |                     |   | A new Enrichment Topic “explore the relation between constructible numbers and rational and irrational numbers” was added.  |
| Using Percentages                                | ✓              |     |                     | 5. Using percentages  | Problems on rates were deleted and only problems on salaries tax were required among taxation problems.   |

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| More about Percentages                       |                |     | ✓                   |   | The two LUs were combined into one LU.   |
| Rate and Ratio                               |                | ✓   |                     | 6. Rates, ratios and proportions                                    | The curriculum content on the concept of proportions, including direct and inverse proportions, was added.   |
| Formulating Problems with Algebraic Language | ✓              |     |                     | 7. Algebraic expressions  | The curriculum content on finding the general term of a sequence was deleted.  |
|  |                |     | ✓                   |   | The required sequences were revised as sequences of odd numbers, even numbers, square numbers, and triangular numbers.   |
|  |                |     | ✓                   |   | The curriculum content on the method of substitution, formulating simple algebraic equations and inequalities in the original LU was integrated into relevant LUs. |
| Linear Equations in One Unknown              | ✓              |     |                     | 8. Linear equations in one unknown                                  | The Enrichment Topic “solve literal equations” was deleted.  |
| Linear Equations in Two Unknowns             |                |     | ✓                   | 9. Linear equations in two unknowns                                 | The Enrichment Topic “explore simultaneous equations that are inconsistent or that have no unique solution” was revised as a Foundation Topic.                     |

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| Laws of Integral Indices                   |                |     | ✓                   | 10. Laws of integral indices  | Only the curriculum content on the binary number system and the denary number system was included as a Non-foundation Topic. The content on other numeral systems, such as the hexadecimal number system, was revised as an Enrichment Topic. |
|  |                |     | ✓                   |   | The curriculum content on scientific notation was moved from the original LU “Approximation and Errors” to this LU.   |
| Manipulations of Simple Polynomials        |                |     | ✓                   | 11. Polynomials   | The two LUs were combined into one LU.  |
| Factorization of Simple Polynomials        |                |     | ✓                   |   | The curriculum content on factorising polynomials by using identities was moved to LU 12 “Identities”.  |
| Identities                                 | ✓              |     |                     | 12. Identities  | The Non-foundation Topic on factorising polynomials by using identities of difference and sum of two cubes was deleted.   |
|  |                |     | ✓                   |   | The curriculum content on factorising polynomials by using identities was moved from the original LU “Factorization of Simple Polynomials” to this LU.  |
| Formulas                                   |                |     | ✓                   | 13. Formulae  | The curriculum content on factorisation was integrated into LU 11 “Polynomials”.  |

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| <b>Measures, Shape and Space Strand</b>                              |                |     |                     |   |   |
| Estimation in Measurement  | ✓              |     |                     | 15. Errors in measurement   | The curriculum content on units, measuring tools and techniques was deleted.  |
|  |                |     | ✓                   |   | The curriculum content on estimation strategies in measurement was revised as an Enrichment Topic.  |
| Simple Idea of Areas and Volumes<br><br>More about Areas and Volumes |                |     | ✓                   | 16. Arc lengths and areas of sectors<br><br>18. Mensuration         | The curriculum content of the original LUs was reorganised as LU 16 “Arc lengths and areas of sectors” and LU 18 “Mensuration”.   |
|  | ✓              |     |                     |   | The curriculum content on the formula for areas of circles was moved to Key Stage 2.  |
|  | ✓              |     |                     |   | The curriculum content on accumulated errors was deleted.   |
|  | ✓              |     |                     |   | The curriculum content on distinguishing between formulae for length, area, and volume by considering dimensions was deleted.   |
|  | ✓              |     |                     |   | The Enrichment Topic “explore the maximum area of figures for a given perimeter” was deleted.   |
|  |                |     | ✓                   |   | A new Enrichment Topic “recognise the Circle Dissection Algorithm of the ancient Chinese mathematician Liu Hui and further recognise Huilu and Tsulu (approximations of $\pi$ )” was added. |

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| Introduction to Geometry (Partial)         |                             |     | ✓                   | 17. 3-D figures   | The curriculum content on 3-D figures in the two original leaning units was combined into LU 17 “3-D figures”.  |
| More about 3-D Figures                     | ✓                           |     |                     |   | The curriculum content on the reflectional and rotational symmetries of 3-D figures was deleted.  |
|  | ✓                           |     |                     |   | The curriculum content on the nets of 3-D figures was deleted.  |
|  |                             |     | ✓                   |   | The curriculum content on the three orthographic views of 3-D figures was revised as an Enrichment Topic.   |
|  |                             |     | ✓                   |   | The curriculum content on Euler’s formula and regular polyhedral was revised as Enrichment Topics.  |
|  | ✓                           |     |                     |   | The curriculum content on projections, the angle between a line and a plane, and the angle between 2 planes was moved to the Compulsory Part of senior secondary. |
|  | ✓                           |     |                     |   | The Enrichment Topics “recognize some semi-regular polyhedra (Archimedean Solids)” and “assemble a set of Soma Cube into a larger cube” were deleted.             |
|  | Transformation and Symmetry | ✓   |                     |   | ✓   |

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| Angles related with Lines and Rectilinear Figures   |                |     | ✓                   | 19. Angles and parallel lines<br>20. Polygons                       | The curriculum content on angles associated with intersecting lines and parallel lines, and the exterior angles and interior angles of polygons was reorganised as LU 19 “Angles and parallel lines” and LU 20 “Polygons”. |
| Introduction to Geometry (Partial)                  | ✓              |     |                     |   | The curriculum content on recognising different types of angles and the degree measurement of angles was moved to Key Stage 2.   |
|   |                |     | ✓                   |   | The curriculum content on regular polygons that tessellate was revised as a Non-foundation Topic. The figures discussed included triangles and quadrilaterals on top of regular polygons.                                  |
|   | ✓              |     |                     |   | The Enrichment Topic “discuss past attempts in constructing some special regular polygons such as 17-sided regular polygons” was deleted.  |
| Congruence and Similarity                           |                |     | ✓                   | 21. Congruent triangles<br>22. Similar triangles                    | The curriculum content of the original LUs was reorganised as LU 21 “Congruent triangles” and LU 22 “Similar triangles”.   |
| Simple Introduction to Deductive Geometry (Partial) | ✓              |     |                     |   | The curriculum content on using the concepts of transformation and symmetry to explore congruence and similarity was deleted.  |
|   |                | ✓   |                     |   | A new Non-foundation Topic “recognise the concept of congruent 2-D figures” was added.   |
|   |                | ✓   |                     |   | A new LO “recognise the concept of similar 2-D figures” was added.   |

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|   |                |     | ✓                   |   | The concepts of deductive reasoning were integrated into LU 21 “Congruent triangles”, LU 22 “Similar triangles”, LU 23 “Quadrilaterals” and LU 24 “Centres of triangles”.  |
|   | ✓              |     |                     |   | The Enrichment Topic “discuss the possibility of trisecting an angle by compasses and straight edges” was deleted.   |
|   |                | ✓   |                     |   | A new Enrichment Topic “explore the angles that can be constructed with compasses and straightedge” was added.   |
| Quadrilaterals                                      |                | ✓   |                     | 23. Quadrilaterals  | A new Enrichment Topic “explore the conditions for congruent quadrilaterals” was added.  |
| Simple Introduction to Deductive Geometry (Partial) |                | ✓   |                     | 24. Centres of triangles  | A new LO “understand the properties of angle bisectors and perpendicular bisectors” was added.   |
|   |                |     | ✓                   |   | The curriculum content on the four centres of triangles was reorganised as the LOs “understand the concurrence of angle bisectors and the concurrence of perpendicular bisectors of a triangle” and “recognise the concurrence of medians and the concurrence of altitudes of a triangle”. |
|   | ✓              |     |                     |   | The curriculum content on the triangle inequality was deleted.   |
|   | ✓              |     |                     |   | The Enrichment Topic “prove some properties of the centres of the triangle” was deleted.   |

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| Pythagoras' Theorem  |                |     | ✓                   | 25. Pythagoras' theorem   | The curriculum content on irrational numbers and surds in the original LU was integrated into LU 4 "Rational and irrational numbers".   |
|  | ✓              |     |                     |   | The Non-foundation Topic on the First Crisis of Mathematics was deleted. History of the crisis was suggested to be introduced if deemed appropriate.  |
|  | ✓              |     |                     |   | The Enrichment Topics "investigate and compare the approaches behind in proving Pythagoras' Theorem in different cultures" and "explore various methods in finding square root" were deleted. |
|  |                | ✓   |                     |   | A new Enrichment Topic "explore Pythagorean triples" was added.   |
| Introduction to Coordinates<br><br>Coordinate Geometry of Straight Lines |                |     | ✓                   | 26. Rectangular coordinate system                                   | The two LUs were combined into one LU.  |
|  | ✓              |     |                     |   | The curriculum content on polar coordinate system was deleted.  |
|  | ✓              |     |                     |   | The relation between slopes and inclinations of straight lines in the rectangular coordinate plane was tackled in the Compulsory Part of senior secondary.                                    |



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|   |                |     | ✓                   |   | The Non-foundation Topic on using the analytic approach to prove results relating to rectilinear figures was revised as the Foundation Topic “use coordinate geometry to perform simple geometric proofs”. |
|   | ✓              |     |                     |   | The Non-foundation Topic on choosing appropriate methods to prove results relating to rectilinear figures was deleted.   |
| Trigonometric Ratios and Using Trigonometry                   |                |     | ✓                   | 27. Trigonometry  | The curriculum content on the computation of fractions with radicals, such as $\sqrt{2}$ , as denominators was integrated into LU 4 “Rational and irrational numbers”.                                     |
| <b>Data Handling Strand</b>                                   |                |     |                     |   |  |
| Introduction to Various Stages of Statistics                  | ✓              |     |                     | 28. Organisation of data  | The curriculum content on various stages involved in statistics was deleted.   |
|   | ✓              |     |                     |   | The curriculum content on using simple methods to collect data was deleted.  |
| Construction and Interpretation of Simple Diagrams and Graphs | ✓              |     |                     | 29. Presentation of data  | The curriculum content on scatter diagrams was deleted.  |
|   | ✓              |     |                     |   | The curriculum content on pie charts was moved to Key Stage 2.   |
|   |                | ✓   |                     |   | A new LO “interpret statistical charts representing two different sets of data in daily life” was added.   |

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| Measures of Central Tendency               | ✓              |     |                     | 30. Measures of central tendency                                    | The LO “construct data sets with a given mean, median and mode” was deleted.   |
|  | ✓              |     |                     |   | The two operations “removal of a certain item from the data” and “insertion of zero in the data set” were deleted from the LO “understand the effects of the following operations on the mean median, and mode:”.                                |
| Simple Idea of Probability                 | ✓              |     |                     | 31. Probability   | The curriculum content on geometric probability was deleted.   |
|  | ✓              |     |                     |   | The curriculum content on comparing the empirical and theoretical probabilities was deleted.   |
|  |                |     | ✓                   |   | The curriculum content on recognising the meaning of expectation was revised as a Non-foundation Topic.  |
| <b>Further Learning Unit</b>               |                |     |                     |   |  |
| (no corresponding LU)                      |                | ✓   |                     | 32. Inquiry and investigation                                       | This is a newly added LU. The time is allocated for students to engage in learning activities from different LUs, for example, activities on Enrichment Topics, cross-LU activities, and cross-KLA activities that based on mathematical topics. |