Stage 2 Essential Mathematics Program 2

Topic 1: Scales, Plans, and Models, Topic 2: Measurement, Topic 3: Business Applications, Topic 4: Statistics,

Topic 5: Investments and Loans

|  | **Lesson 1 – Single Lesson** | **Lesson 2 – Single Lesson** | **Lesson 3 – Double Lesson** |
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| **Term One****Week 1** | **Course Overview and Expectations**  | **TOPIC ONE: SCALES, PLANS, AND MODELS**Review 2D shapes and their properties including vertices and edges.(square, rectangle, rhombus, parallelogram, trapezium, circle, triangles, and polygons) | Review 3D shapes and their properties including faces, vertices and edges. (cube, sphere, prisms, pyramids, cylinder and cones) |
| **Week 2** | Recognising 3D shapes from 2D representationsNet 🡪 3D solid | Creating Scaled Diagrams* Taking measurements within school to construct a scaled diagram
 | Creating Scaled Diagrams* Commonly used symbols, labelling
* What are appropriate scales to use
* Accuracy of measurements and the effect of errors
 |
| **Week 3** | Reading and Interpreting Scaled Diagrams* Finding lengths, perimeters and area
* Can scaled diagrams tell us everything, e.g. steepness of hills
* Accuracy of measurements and the effect of errors on calculations
 | Reading and Interpreting Scaled Diagrams* Finding lengths, perimeters and area
* Can scaled diagrams tell us everything, e.g. steepness of hills
* Accuracy of measurements and the effect of errors on calculations
 | Using bearings to solve problems |
| **Week 4** | REVISION | **SCALES, PLANS AND MODELS – SAT ONE****30 minutes Non Calculator** **20 minutes Calculator** | **TOPIC TWO: MEASUREMENT** Review: * Linear measurement units
* Conversion between units km, m, cm, and mm
* Conversion between metric and imperial
* Perimeter of polygons, triangles, squares, and rectangles
* Calculating circumference of circles and perimeter of arcs
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| **Week 5** | Given perimeter rearrange formula to find unknown lengths (e.g. Find the radius of a circle given the circumference) | Perimeter of composite shapes | Finding missing sides of right-angled triangles * Using Pythagoras Theorem

(Including questions involving angle of elevation/depression) |
| **Week 6** | Finding missing sides of right-angled triangles * Using sine, cosine and tangent ratios

(Including questions involving angle of elevation/depression) | Finding missing sides of right-angled triangles * Using sine, cosine and tangent ratios

(Including questions involving angle of elevation/depression) | Finding missing sides of non-right-angled triangles using sine rule |
| **Week 7** | Finding missing sides of non-right-angled triangles using cosine rule | Finding missing sides of non-right-angled triangles using cosine rule | What are the appropriate units for area and how do we convert between them.?(including hectare and acres)Areas of regular shapes(triangles, squares, rectangles, parallelograms, trapeziums, circles, and sectors) |
| **Week 8** | Areas of composite shapes | Areas of composite shapes | Area of irregular shapes* Using simple shapes
* Simpson’s rule
 |
| **Week 9** | Calculating surface area of cubes, rectangular and triangular based prisms, pyramids, cylinders and spheres | Calculating surface area of cubes, rectangular and triangular based prisms, pyramids, cylinders and spheres | Calculating surface area simple composite 3D shapes |

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| **Week 10** | **FOLIO ONE** | Converting metric units of massThe connection between volume and capacity and conversion between them (e.g. 1cm3= 1mL and 1m3=1kL)The connection between volume and mass * Units of measurement for density
* Calculating density
 | Calculating the volume of cubes, rectangular and triangular prisms, pyramids, cones, cylinders, and spheres |
| **Week 11** | REVISION | **MEASUREMENT – SAT TWO****20 minutes Non Calculator** **30 minutes Calculator** | **FOLIO ONE**  |
| Term Two**Week 1** | **TOPIC THREE: BUSINESS APPLICATIONS** Factors that affect location of a businessCalculating the cost of business premises | Introduction to the pricing of goods to be sold and key terms – manufacturer’s cost, wholesaler’s cost, retail cost, profit margin, discount, GST, and input tax credits. | Trade discount, series discount |
| **Week 2** | GST (The whole process from manufacturer to retailer) | GST (The whole process from manufacturer to retailer) | Calculating selling price given profit margins |
| **Week 3** | Depreciation methods* Straight-line method
 | Depreciation methods* Reducing balance depreciation
 | Depreciation graphs |
| **Week 4** | Discussion of other business costs e.g. insurance, WorkCover, public liability, and their importance. | Input tax credit calculations | Fixed and variable costs |
| **Week 5** | Break-even point * Graphically
 | Break-even point * Marginal income
 | Profit-and-loss statements and profit projections by hand and via Excel |
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| **Week 6** | Introduction to business structures and tax advantages for different types:* Sole trader
* Partnership
* Company
 | Tax calculations for sole trader and partnership business structures. | Tax calculations for sole trader and partnership business structures.REVISION |
| **Week 7** | **BUSINESS APPLICATIONS –** **SAT THREE** | **TOPIC FOUR: STATISTICS**Understanding the key terms of sampling and why we sample.Census, Population, Sample, Survey | Sampling methods and their advantages and disadvantages:* Simple random
* Stratified
* Systematic
* Self-selected
 |
| **Week 8** | Sample size and its impact on reliability | Bias in sampling (faults and errors)* Sampling errors
* Measurement errors
* Coverage errors
* Non-response errors
 | Calculation of measures of central tendency and spread.* Mean
* Median
* Range
 |
| **Week 9** | MID YEAR EXAMS |
| **Week 10** | Calculation of measures of central tendency and spread.* Interquartile range
* Standard Deviation
 | Outliers and the effect on distributions | **FOLIO TWO** |

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| Term Three**Week 1** | Review Stem-and-leaf plots | Review Box-and-whisker diagrams | Graphing linear relationships to see if there is a connection between two variables* Independent and dependent variables
* How to draw scatter plots
* Patterns and features of scatter plots
* Description of association (direction, form, and strength)
* Causality
 |
| **Week 2** | Pearson’s correlation coefficient | When do we create a line of best fit:* Coefficient of determination $r^{2}$
* Least squares regression line
 | When do we create a line of best fit:* Coefficient of determination $r^{2}$
* Least squares regression line
 |
| **Week 3** | Using the line of best fit to interpolate and extrapolate. | Outliers effect on linear relationship. | **FOLIO TWO** |
| **Week 4** | **TOPIC FIVE: INVESTMENTS AND LOANS**Review investing money via simple interest investments(focus on rearranging formula) | Review investing money via compound interest investments | What impacts earnings of investments?* Inflation
* Taxation
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| **Week 5** | Introduction to future-value annuitiesFuture-value annuity calculations:* Future values
* Regular deposit
* Number of periods
* Interest rate
* Interest earned

(Including assumptions made in these calculations) | Future-value annuity calculations:* Future values
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 (Including assumptions made in these calculations) |
| **Week 6** | Applications of Annuities* Long-term investments
* Superannuation
 | Applications of Annuities* Long-term investments
* Superannuation
 | Impact on investment* Taxation
* Inflation
 |
| **Week 7** | Introduction to present-value annuitiesCost of a loan calculations:* Present value
* Regular payment
* Number of periods
* Interest rate
* Interest paid

 (Including assumptions made in these calculations) | Cost of a loan calculations:* Present value
* Regular payment
* Number of periods
* Interest rate
* Interest paid

(Including assumptions made in these calculations) | Cost of a loan calculations:* Present value
* Regular payment
* Number of periods
* Interest rate
* Interest paid

(Including assumptions made in these calculations) |
| **Week 8** | What is the best loan option?* Charges on loan
* Comparison rates (no calculations)
 | What is the best loan option?* Charges on loan
* Comparison rates (no calculations)
 | **FOLIO THREE** |

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| **Week 9** | REVISION | **INVESTMENT AND LOANS****– SAT FOUR** | **FOLIO THREE** |
| **Week 10** | EXAM REVISION | EXAM REVISION | EXAM REVISION |
| Term Four**Week 1** | EXAM REVISION | EXAM REVISION | EXAM REVISION |
| **Week 2** | EXAM REVISION | EXAM REVISION | EXAM REVISION |
| **Week 3** | **SWAT VAC – NO CLASSES** |
| **Week 4** | **EXAMINATIONS START** |
| **Week 5** |