Year 3 Mathematics

Subject Group Overview

| Unit title | Key concept | Related Concept(s) | Global context & Exploration | Statement of inquiry | MYP subject specific objectives and strands | Content (topics, knowledge, skills) |
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| Unit A: Real Numbers, Exponents and Scientific Notation | Relationships | Equivalence Systems | GC: Personal and Cultural Expression<br><br>Exploration: Analysis and argument | Relationships can be represented, analyzed and justified for equivalency. | A, C, D: all strands | Analyze the results of performing operations with varied forms of real numbers and justify which is more accurate and/or efficient.<br><br>Apply the properties of integer exponents to generate equivalent numerical expressions.<br><br>Use the cube root symbol to represent solutions to equations of the form $x^3 = p$, where p is a positive rational number<br><br>Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities.<br><br>Use numbers expressed in the form of a single digit times an integer power of 10 to express how many times as much one is than the other |
| Unit B: Linear Equations | Relationships | Model Equivalence | GC: Scientific and Technical Innovation<br><br>Exploration: Processes and solutions | Equivalent relationships can be represented by a model that illustrates a process and solution (end result). | A, B: all strands | · Construct a viable argument to correct an error on a multi-step linear equation.<br><br>Solve a multi-step equation using at least two different solution methods, and justify reasoning.<br><br>· Solve linear equations in one |

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| | | | | | | variable, with or without a real world context.<br><br>Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions.<br><br>Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. |
| Unit C: Graphing Linear Equations and Systems | Relationships | Equivalence Model | GC: Scientific and technical Innovation<br><br>Exploration: models | Equivalent relationships can be represented by a model. | A, B, D: all strands | Interpret the unit rate as the slope of the graph. **(MAFS.8.EE.2.5)**<br><br>Compare two different proportional relationships represented in different ways. **(MAFS.8.EE.2.5)**<br><br>Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane. **(MAFS.8.EE.2.6)**<br><br>Derive the equation y = mx for a line through the origin. **(MAFS.8.EE.2.6)**<br><br>Derive the equation y = mx + b for a line intercepting the vertical axis at b. **(MAFS.8.EE.2.6)**<br><br>Construct a function to model a linear relationship between two |

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| | | | | | | quantities. **(MAFS.8.F.2.4)**<br><br>Interpret the rate of change of a linear function in terms of the situation it models, and in terms of its graph or a table of values. **(MAFS.8.F.2.4)**<br><br>Interpret the initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. **(MAFS.8.F.2.4)**<br><br>Solve real-world and mathematical problems leading to two linear equations in two variables. (**MAFS.8.EE.3.8)**<br><br>Solve systems of two linear equations in two variables algebraically. (**MAFS.8.EE.3.8)** |
| Unit D: Functions | Relationships | Pattern<br><br>Representation | GC: Personal and cultural expression<br><br>Exploration: Analysis and argument | By analyzing patterns in representations, you can justify relationships. | A, B, D: all strands | Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). **(MAFS.8.F.1.2)**<br><br>Give examples of functions that are not linear. **(MAFS.8.F.1.3)**<br><br>Construct a function to model a linear relationship between two quantities. **(MAFS.8.F.2.4)**<br><br>Interpret the rate of change of a linear function in terms of the situation it models, and in terms |

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| | | | | | | of its graph or a table of values. **(MAFS.8.F.2.4)**<br><br>Interpret the initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. **(MAFS.8.F.2.4)**<br><br>Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). **(MAFS.8.F.2.5)**<br><br>Sketch a graph that exhibits the qualitative features of a function that has been described verbally. **(MAFS.8.F.2.5)** |
| Unit E: Transformational and Measurement Geometry | Relationships | Pattern<br>Measurement | GC: Personal and cultural expression<br><br>Exploration: Analysis and argument | When analyzing patterns and measurement, one can justify and describe relationships. | A, C: all strands | Verify experimentally the properties of rotations, reflections, and translations: **(8.G.1.1)**<br>a. Lines are taken to lines, and line segments to line segments of the same length.<br>b. Angles are taken to angles of the same measure.<br>c. Parallel lines are taken to parallel lines.<br><br>Given two congruent figures, describe a sequence that exhibits the congruence between them. **(8.G.1.2)**<br><br>Describe the effect of dilations, translations, rotations, and |

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| | | | | | | reflections on two-dimensional figures using coordinates. **(8.G.1.3)**<br><br>Given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them. **(8.G.1.4)**<br><br>Use informal arguments to establish facts about the angle sum and exterior angle of triangles **(8.G.1.5)**<br><br>Use informal arguments to establish facts about the angles created when parallel lines are cut by a transversal<br><br>Use informal arguments to establish facts about the angle-angle criterion for similarity of triangles. . **(8.G.1.5)** |
| Unit F: Pythagorean Theorem and Volume | Form | Measurement<br><br>Model | GC: Orientation in Space and Time<br><br>Exploration: Contratints and adaptation | By analyzing models and measurement of form, you can recognize constraints and possible adaptations. | A, C, D: all strands | Explain a proof of the Pythagorean Theorem and its converse. **(MAFS.8.G.2.6)**<br><br>Explain a proof of the converse of the Pythagorean Theorem. **(MAFS.8.G.2.6)**<br><br>Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two dimensions. **(MAFS.8.G.2.7)** |

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| | | | | | | Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in three dimensions. **(MAFS.8.G.2.7)**<br><br>Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. **(MAFS.8.G.2.8)**<br><br>Use formula for cones to solve real-world and mathematical problems. **(MAFS.8.G.3.9)**<br><br>Use formula for cylinders to solve real-world and mathematical problems. **(MAFS.8.G.3.9)**<br><br>Use formula for spheres to solve real-world and mathematical problems. **(MAFS.8.G.3.9)** |
| Unit G: Statistics | Relationships | Respresentation<br>Justification | GC: Scientific and Technical Innovation<br><br>Exploration: Solutions | Analyzing frequency and variability within representations can justify relationships. | A, B, C, D: all strands | Construct scatter plots for bivariate measurement data to investigate patterns of association between two quantities. (**MAFS.8.SP.1.1)**<br><br>Interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. (**MAFS.8.SP.1.1)**<br><br>For scatter plots that suggest a linear association, informally fit a straight line **(MAFS.8.SP.1.2)** |

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| | | | | | | Informally assess the model fit by judging the closeness of the data points to the line. **(MAFS.8.SP.1.2)**<br><br>Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope. (**MAFS.8.SP.1.3)**<br><br>Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the intercept. (**MAFS.8.SP.1.3)**<br><br>Construct a two-way table summarizing data on two categorical variables collected from the same subjects. (**MAFS.8.SP.1.4)**<br><br>Interpret a two-way table summarizing data on two categorical variables collected from the same subjects.(**MAFS.8.SP.1.4)**<br><br>Use relative frequencies calculated for rows or columns to describe possible association between the two variables. (**MAFS.8.SP.1.4)** |