

| Unit Description | Unit Objectives |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>In Unit 3, students will develop the mathematical understanding and skills to solve problems relating to:</p> <ul style="list-style-type: none"> • Fundamental topic: Calculations • Topic 1: Measurement • Topic 2: Scales, plans and models • Topic 3: Summarising and comparing data. <p>The subject matter of the topics in this unit should be applied in a context that is meaningful and of interest to students. A variety of approaches can be used to achieve this purpose. Two possible contexts that may be used in this unit are 'Mathematics of designs' and 'Mathematics of the media'. However, these contexts may not be relevant to all students. Suitable contexts relevant to the particular student cohort should be chosen.</p> | <p>Students will:</p> <ol style="list-style-type: none"> 1. select, recall and use facts, rules, definitions and procedures drawn from all Unit 3 topics 2. comprehend mathematical concepts and techniques drawn all Unit 3 topics 3. communicate using mathematical, statistical and everyday language and conventions 4. evaluate the reasonableness of solutions 5. justify procedures and decisions by explaining mathematical reasoning 6. solve problems by applying mathematical concepts and techniques drawn from all Unit 3 topics. |

| Assessment Plan: | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------|
| Task | | Objectives to be assessed | Conditions | Date |
| IA1 – Internal Assessment 1 PSMT – Unit 3 – Measurement and scale | | All objectives included on assessment item | 5 weeks (including 10 hours of class time) | Term 1 Week 9 |
| Task | | Objectives to be assessed | Conditions | Date |
| IA2 – CIA - Common Internal Assessment Examination – <i>representatively sample all Unit 3 topics</i> (Developed externally by QCAA) | | All objectives included on assessment item | Closed Book Technology Active 60 minutes (+ 5 minutes perusal) Part A – Simple Part B – Complex | Term 2 Week 9 |

| Monitoring and Reviewing: | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------|
| Strategies for Monitoring Student Progress | Planned Reviews at Key Intervals | Date |
| Student Summary Rule book – separate book following through all units Proficiency scales KNOW and be able to DO tables (KDT) Regular vocabulary review, HW – weekly review, Formative items Common mistakes recognition Use of online support – Khan Academy, Text-based online support Graphic organisers – e.g. mind maps, Frayer model, KWL (what I know, what I want to know, what I have learnt) | 10 minute review (weekly quiz) during one lesson a week Mathspace quizzes - weekly Formative items | Each week Week 5 Week 10 |

| Underpinning Factors: | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Guaranteed Vocabulary: | Literacy Skills | 21 st Century Skill/s |
| <ul style="list-style-type: none"> ▪ geometric properties ▪ parallel ▪ perpendicular ▪ bisect ▪ two/three-dimensional shapes ▪ prisms , nets ▪ length-millimetre, centimetre, metre kilometre ▪ formulas ▪ perimeter ▪ composite shapes ▪ volume, capacity ▪ right pyramids ▪ cubic units ▪ Pythagoras' theorem ▪ right-angled triangle ▪ hypotenuse ▪ opposite, adjacent ▪ trigonometry sine, cosine, tangent ▪ angle of elevation ▪ angle of depression | <ul style="list-style-type: none"> ▪ millilitres, litres ▪ kilo / megalitres, ▪ mass ▪ milligrams, grams ▪ kilograms ▪ metric tonnes ▪ outlier ▪ quartiles, decile ▪ percentile ▪ measures of spread/dispersion ▪ central tendency ▪ mean, mode, median ▪ five-number summary ▪ bimodality ▪ parallel box plots ▪ back-to-back stem plots ▪ histograms ▪ symmetry ▪ skewness <p>Written</p> <ul style="list-style-type: none"> ▪ using technical / procedural vocabulary ▪ using conventions <ul style="list-style-type: none"> - geometric symbols for parallel, perpendicular, etc. - mm^2, cm^2, m^2, km^2, ha - mm^3, cm^3, m^3 - mL, L, kL, ML - mg, g, kg, t - different forms of scales, e.g. ratio, linear key - label drawing correctly - linear measures - degrees and minutes ° - °T <p>Oral</p> <ul style="list-style-type: none"> ▪ describing properties ▪ explaining classification, decision-making, thought processes ▪ discussing comparisons ▪ naming triangle sides, describing relationships <p>Visual</p> <ul style="list-style-type: none"> ▪ using diagrams ▪ using tables and graphs | <p>critical thinking</p> <ul style="list-style-type: none"> ▪ reflecting and evaluating, problem-solving ▪ analytical thinking, decision-making <p>creative thinking</p> <ul style="list-style-type: none"> ▪ seeing new links, creativity in design, innovation ▪ initiative and enterprise, generating and applying new ideas ▪ identifying alternatives <p>communication</p> <ul style="list-style-type: none"> ▪ using language, symbols and texts ▪ communicating ideas effectively <p>collaboration and teamwork</p> <ul style="list-style-type: none"> ▪ relating to others , participating and contributing <p>ICT</p> <ul style="list-style-type: none"> ▪ being productive users of technology ▪ accessing and analysing information |

| | | Numeracy Skills | Cognitive Verbs |
|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <ul style="list-style-type: none"> ▪ recognising familiar shapes ▪ deciphering information, e.g. diagrams, instructions ▪ making decisions and judgments ▪ calculating with statistical measures ▪ calculating using technology ▪ calculating with whole numbers ▪ developing an understanding of the meaning of decimals and measurements ▪ recognising the connection between volume and capacity ▪ making decisions and judgments about reasonableness ▪ recognising a constant pattern ▪ graphing ▪ interpreting statistical information | <p>Retrieval and Comprehension: understanding, describe, demonstrate, required, identify, identifying, construct, solve, calculate, recall, use, summarising, calculating, use, used, using, draw, explain, select</p> <p>Analysis: categorise, comparing, determining, compare, determine, apply, compared, organise, comparison, identify, reflect, consider, differentiating, contrasting, interpret, analyse</p> <p>Knowledge Utilisation: solve, discuss, investigate, design, develop, investigating, justify, deconstruct, explore, comment, construct, create, experiment, predict, decide, constructing, manipulating, generate</p> |

TEACHING AND LEARNING PLAN:

| Hours/Weeks | Unit Objectives | Topic Subject Matter | Learning Experiences [reflecting DQ 3, 4, 5 and 6] | Possible Resources |
|-------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Term 1 7 Weeks | 1, 2, 3, 4, 5, 6 | <p>Measurement</p> <p>Geometry (3 hours)</p> <ul style="list-style-type: none"> • recognise the properties of common two-dimensional geometric shapes, including squares, rectangles and triangles, and three-dimensional solids, including cubes, rectangular-based prisms and triangular-based prisms • interpret different forms of two-dimensional representations of three-dimensional objects, including nets of cubes, rectangular-based prisms and triangular-based prisms [complex] <p>Linear measure (5 hours)</p> <ul style="list-style-type: none"> • use metric units of length (millimetres, centimetres, metres, kilometres), their abbreviations (mm, cm, m, km), conversions between them, and appropriate levels of accuracy and choice of units • estimate lengths • use formulas to calculate perimeters of familiar shapes, including triangles, squares, rectangles, polygons, circles and arc lengths • use formulas to calculate perimeters of familiar composite shapes [complex] <p>Area measure (9 hours)</p> <ul style="list-style-type: none"> • use metric units of area (square millimetres, square centimetres, square metres, square kilometres, hectares), their abbreviations (mm², cm², m², km², ha), conversions between them and appropriate choices of units • estimate the areas of different shapes • use formulas to calculate areas of regular shapes, including triangles, squares, rectangles, parallelograms and circles • use formulas to calculate areas of regular shapes, including trapeziums and sectors [complex] • use formulas to calculate areas of composite figures by decomposing them into regular shapes [complex] <p>use formulas to calculate surface areas of familiar prisms, including cubes, rectangular and triangular prisms, spheres and cylinders [complex]</p> <ul style="list-style-type: none"> • use formulas to calculate surface areas of familiar pyramids, including rectangular-based and triangular-based pyramids [complex] • use formulas to calculate surface areas of irregular solids [complex] <p>Volume and capacity (6 hours)</p> <ul style="list-style-type: none"> • use metric units of volume (cubic millimetres, cubic centimetres, cubic metres), their abbreviations (mm³, cm³, m³), conversions between them and appropriate choices of units • understand and use the relationship between volume and capacity, recognising that 1 cm³ = 1 mL (millilitre), 1000 cm³ = 1 L (litre), 1 m³ = 1 kL (kilolitre), 1000 kL = 1 ML (megalitre) • estimate volume and capacity of various objects • use formulas to calculate the volume and capacity of regular objects, including cubes, rectangular and triangular prisms, and cylinders • use formulas to calculate the volume and capacity of right pyramids, including square-based and rectangular-based pyramids, and spheres | | <p>Textbook Essential Mathematics Units 3&4 (Cambridge)</p> <p>Digital version also available</p> |

| Hours/Weeks | Unit Objectives | Topic Subject Matter | Learning Experiences [reflecting DQ 3, 4, 5 and 6] | Possible Resources |
|-------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--------------------|
| Term 1 1 Week | 1, 2, 3, 4, 5, 6 | Measurement Mass (4 hours) <ul style="list-style-type: none"> • use metric units of mass (milligrams, grams, kilograms, metric tonnes), their abbreviations (mg, g, kg, t), conversions between them and appropriate choices of units • estimate the mass of different objects • recognise the need for milligrams | | |
| Term 2 5 Weeks | 1, 2, 3, 4, 5, 6 | Scales, plans and models Interpret scale drawings (6 hours) <ul style="list-style-type: none"> • interpret commonly used symbols and abbreviations in scale drawings • find actual measurements from scale drawings, including lengths, perimeters and areas • estimate and compare quantities, materials and costs using actual measurements from scale drawings [complex] Creating scale drawings (4 hours) <ul style="list-style-type: none"> • understand and apply drawing conventions of scale drawings, including scales in ratio, clear indications of dimensions and clear labelling [complex] • construct scale drawings by hand and by using software packages [complex] Right-angled triangles (5 hours) <ul style="list-style-type: none"> • apply Pythagoras' theorem to solve problems for all side lengths using $a^2 + b^2 = c^2$ • apply the tangent, sine and cosine ratios to find unknown angles and sides using $\tan\theta = \frac{o}{A}$, $\sin\theta = \frac{o}{H}$ and $\cos\theta = \frac{A}{H}$ [complex] • use the concepts of angle of elevation and angle of depression to solve practical problems [complex] | | |

| Hours/Weeks | Unit Objectives | Topic Subject Matter | Learning Experiences [reflecting DQ 3, 4, 5 and 6] | Possible Resources |
|-------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--------------------|
| Term 2 5 Weeks | 1, 2, 3, 4, 5, 6 | <p>Summarising and interpreting data</p> <p>Summarising and interpreting data (8 hours)</p> <ul style="list-style-type: none"> • identify the mode from a dataset • calculate measures of central tendency, the mean and the median from a dataset • investigate the suitability of measures of central tendency in various real-world contexts [complex] • investigate the effect of outliers on the mean and the median [complex] • calculate quartiles from a dataset [complex] • interpret quartiles, deciles and percentiles from a graph [complex] • use everyday language to describe spread, including spread out, dispersed, tightly packed, clusters, gaps, more/less dense regions, outliers • calculate and interpret statistical measures of spread, such as the range, interquartile range and standard deviation [complex] • investigate real-world examples from the media illustrating inappropriate uses of measures of central tendency and spread [complex] <p>Comparing datasets (5 hours)</p> <ul style="list-style-type: none"> • complete a five-number summary for different datasets • construct box plots using a five-number summary • compare parallel box plots and back-to-back stem plots for different datasets [complex] • compare the characteristics of the shape of histograms using symmetry, skewness and bimodality, where applicable [complex] | | |