| KIRWAN STATE HIGH SCHOOL | SUBJECT: ESSENTIAL MATHEMATICS | UNIT: 1 |
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| Unit Description | Unit Objectives |
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| In Unit 1, students will develop the mathematical understanding and skills to solve problems relating to the topics:<br>• Fundamental topic: Calculations<br>• Topic 1: Number<br>• Topic 2: Representing data<br>• Topic 3: Graphs.<br><br>The subject matter of the topics in this unit should be applied in contexts that are meaningful and of interest to students. A variety of approaches can be used to achieve this purpose. Two possible contexts that may be used are 'Mathematics of foods' and 'Mathematics of sports'. However, these contexts may not be relevant to all students. Suitable contexts relevant to the particular student cohort should be chosen. | Students will:<br>1. select, recall and use facts, rules, definitions and procedures drawn from all Unit 1 topics<br>2. comprehend mathematical concepts and techniques drawn all Unit 1 topics<br>3. communicate using mathematical, statistical and everyday language and conventions<br>4. evaluate the reasonableness of solutions<br>5. justify procedures and decisions by explaining mathematical reasoning<br>6. solve problems by applying mathematical concepts and techniques drawn from all Unit 1topics. |

| Assessment Plan: | | | | |
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| **Task** | | **Objectives to be assessed** | **Conditions** | **Date** |
| IA1 – Internal Assessment 1<br>PSMT – *Unit 1 – Topic 1*<br><br>The task will explore a variety of concepts and ideas involving Calculations and Number so that a reality TV cooking show contestant can plan and modify a recipe to cater for extra guests. | | As above – all objectives included on assessment item | 5 weeks - including 10 hours of class time | Due Week 9 |
| **Task** | | **Objectives to be assessed** | **Conditions** | **Date** |
| IA2 – Internal Assessment 2<br>Examination – *representatively sample all Unit 1 topics not assessed by the PSMT* | | As above – all objectives included on assessment item | Closed Book<br>QCAA formula sheet required<br>Technology Active<br><br>60 minutes + 5 minute perusal | Term 2<br>Week 9 |

| Monitoring and Reviewing: | | | |
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| **Strategies for Monitoring Student Progress** | **Date** | **Planned Reviews at Key Intervals** | **Date** |
| Student Summary Rule book – separate book following through all units<br>Proficiency scales<br>KNOW and be able to DO tables (KDT)<br>Regular vocabulary review, HW – weekly review, Formative items<br>Common mistakes recognition<br>Use of online support –e.g. - Khan Academy, Text-based online support<br>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<br>Mathspace quizzes - weekly<br><br>Formative items | Each week<br><br><br>Week 5<br>Week 10 |

| Underpinning Factors: | | |
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| **Guaranteed Vocabulary:** | **Literacy Skills** | **21st Century Skill/s** |
| □ ratios<br>□ rates<br>□ fractions<br>□ whole numbers<br>□ decimals<br>□ simplest form<br>□ direct proportion<br>□ quantity<br>□ scales<br>□ simple familiar<br>□ complex familiar<br>□ complex | • written<br>- using technical / procedural vocabulary<br>- using conventions (symbols, abbreviations)<br>• oral<br>- explaining verbally to the class the concept of ratios<br>- in groups, discussing where ratios are used in real-life situations<br>• visual<br>- representing different calculations by using symbolic operations<br>- using calculator displays, tables and graphs<br>- using spreadsheet displays (values and formulas)<br>- using rounding and simplifying methods<br>- using checking | **Critical thinking**<br>-analytical thinking, problem-solving, decision-making<br>-reasoning<br>**Creative thinking**<br>-generating and applying new ideas, identifying alternatives<br>-seeing or making new links, communication--using language, symbols and texts, effective oral communication<br>C**ollaboration and teamwork**<br>-relating to others (interacting with others)<br>-community connections<br>**Personal and social skills adaptability/flexibility**<br>-management (self, career, time, planning and organising)<br>-character (self-awareness), citizenship<br>**ICT skills**<br>-accessing and analysing information, being productive users of technology, including using spreadsheets, digital citizenship (being safe, positive and responsible online) |
| | **Numeracy Skills** | **Cognitive Verbs** |
| | • identifying mathematical information<br>• calculating with whole and decimal numbers<br>• correctly rounding in the context of money and measurements<br>• interpreting tables and charts<br>• using mathematical knowledge in a range of contexts<br>• using digital tools such as online or spreadsheet software<br>• making decisions and judgments with critical orientation | Retrieval and comprehension – use, define, recall, construct (graphs), identify, understand, recognise, explain, sketch, calculate<br><br>Analysis - consider, determine, apply, analyse, deduce, identify<br><br>Knowledge utilisation – investigate, formulate, devise, discuss, develop, solve, design, create (a mathematical model), explore, generate |

**TEACHING AND LEARNING PLAN:**

| Weeks | Unit Objectives | Topic Subject Matter | Learning Experiences [reflecting DQ 3, 4, 5 and 6] | Possible Resources |
|---|---|---|---|---|
| Term 1 Weeks1-3 | 1, 2, 3, 4, 5, 6 | **Number**<br>**Ratios**<br>• demonstrate an understanding of the fundamental ideas and notation of ratio<br>• understand the relationship between fractions and ratio<br>• express a ratio in simplest form using whole numbers<br>• find the ratio of two quantities in its simplest form<br>• divide a quantity in a given ratio [complex]<br>• use ratio to describe simple scales [complex] | Refer to QCAA TLAP | Textbook<br>– Essential Mathematics Units 1&2 (Cambridge)<br>- Digital version also available |
| Term 1 Weeks 4-8 | 1, 2, 3, 4, 5, 6 | **Rates**<br>• review identifying common usage of rates, including km/h<br>• convert between units for rates<br>• complete calculations with rates, including solving problems involving direct proportion in terms of rate [complex]<br>• use rates to make comparisons<br>• use rates to determine costs | | |
| Term 1 Weeks 9-10 | 1, 2, 3, 4, 5, 6 | **Percentages**<br>• calculate a percentage of a given amount<br>• determine one amount expressed as a percentage of another for same units<br>• determine one amount expressed as a percentage of another for different units [complex]<br>• apply percentage increases and decreases in situations, including mark-ups, discounts and GST [complex]<br>• determine the overall change in a quantity following repeated percentage changes [complex]<br>• calculate simple interest for different rates and time periods [complex] | | |

| Weeks | Unit Objectives | Topic Subject Matter | Learning Experiences [reflecting DQ 3, 4, 5 and 6] | Possible Resources |
|---|---|---|---|---|
| Term 2<br>Week 1 | 1, 2, 3, 4, 5, 6 | **Representing data**<br>**Classifying data**<br>• identify examples of categorical data<br>• identify examples of numerical data | | |
| Term 2<br>Weeks 2-4 | 1, 2, 3, 4, 5, 6 | **Data presentation and interpretation**<br>• display categorical data in tables and column graphs<br>• display numerical data as frequency distribution tables, dot plots, stem-and-leaf plots and histograms<br>• recognise and identify outliers from a dataset<br>• compare the suitability of different methods of data presentation in real-world contexts [complex] | | |
| Term 2<br>Weeks 5, 6 | 1, 2, 3, 4, 5, 6 | **Graphs**<br>**Reading and interpreting graphs**<br>• interpret information presented in graphs, such as step graphs, column graphs, pie graphs, picture graphs, conversion graphs of calories ↔ kilojoules, line graphs using units of energy to describe consumption of electricity, including kilowatt hours<br>• interpret information presented in two-way tables<br>• discuss and interpret tables and graphs, including misleading graphs found in the media and in factual texts [complex] | | |
| Term 2<br>Week 7 | 1, 2, 3, 4, 5, 6 | **Drawing graphs**<br>• determine which type of graph is best used to display a dataset<br>• use spreadsheets to tabulate and graph data [complex]<br>• draw a line graph to represent any data that demonstrates a continuous change, such as hourly temperature [complex] | | |
| Term 2<br>Week 8 | 1, 2, 3, 4, 5, 6 | **Using graphs**<br>• use graphs in practical situations<br>• interpret graphs in practical situations [complex]<br>• draw graphs from given data to represent practical situations [complex]<br>• interpret the point of intersection and other important features ($xx$- and $yy$-intercepts) of given graphs of two linear functions drawn from practical contexts [complex] | | |