Stage 1 Essential Mathematics – Semester 2 – Trade focus

Topic 4: Data in Context, Topic 5: Measurement, and Topic 6: Investing

|  | **Lesson 1 – Single Lesson** | **Lesson 2 – Single Lesson** | **Lesson 3 – Double Lesson** |
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| Term Two  **Week 9** | **TOPIC FOUR: DATA IN CONTEXT**  Why do we collect data?  Classification of data   * Categorical data: Nominal and Ordinal * Numerical data: Discrete and Continuous | Understanding and extracting information from tables including Two-way tables  An activity such as ‘Is Australia the Greatest Olympic Sporting Nation?’ on ABS website may assist in engaging students  <http://www.abs.gov.au/websitedbs/CaSHome.nsf/Home/MAT14+Is+Australia+the+Greatest+Olympic+Sporting+Nation> | How do you read graphs including the information that can be accessed from:   * Titles * Axes labels * Scales and keys   Understanding and extracting information from graphs (including line graphs, step graphs, column graphs, picture graphs and pie graphs) |
| **Week 10** | **Practical activity 1** – Collecting categorical data (brand of mobile phone used, methods of transport to school etc). Individual or groups of students can collect different data for use in the following lesson. Students should have some question in mind that they wish the data collected to answer. | **Practical activity 1** continued  Students’ tabulate their own data and that of other groups and display it in different ways graphically using charts in excel. They analyse the different representations of the data and discuss which representation best displays the information. | **Practical activity 1** continued  Students consider the data they have collected and displayed, and discuss whether it supports an answer to the question(s) they were initially considering.  Further activities involving the representation of categorical data graphically if time permits. |
| Term Three  **Week 1** | **Practical activity** **2** – Collecting numerical data  Students measure their reaction time in pairs over 20 trials each | **Practical activity 2** continued  Students’ tabulate their own data and that of their partner and display it in different ways graphically. (stem and leaf plots and histograms) | **Practical activity 2** continued  Students discuss the question of who in their pair has the better reaction time using evidence from their graphs to support their argument. Informal consideration of accuracy and consistency can lay the groundwork for the concepts of central tendency and spread later in the topic.  Further activities involving the representation of numerical data graphically |
| **Week 2** | Line graphs **–** Displaying continuous data | Line graphs – How do we use them?   * Growth charts * Share prices * Temperature over a 24-hour period | Charts presented in media and texts, including looking at the ways in which data can be misrepresented. The ABS has a worksheet available at:  <http://www.abs.gov.au/websitedbs/CaSHome.nsf/Home/MAT06+Misleading+Graphs> |
| **Week 3** | Begin with the data collected in practical activity 2: students consider how they can calculate the ‘typical’ reaction time of each student so that their performances can be compared. (Median and Mean)  Further problems as time permits | Begin with the data collected in practical activity 1: students consider how they can determine the best representative for each data set collected when an average value cannot be calculated. (Mode or Modal group)  Further problems involving measures of central tendency | Outliers and their effect on measures of central tendency  Students consider the idea of measuring ‘consistency’ in the reaction time data collected previously using range and interquartile range.  **Learning activity** – Standard Deviation *(see support materials for details)* |
| **Week 4** | Further problems involving measures of spread  Discussion of the sensitivity to outliers of the various measures of central tendency and spread | **FOLIO ONE**  **Quality control in manufacturing – Consistency in Baking** | Describing data without statistical measure  Revision |
| **Week 5** | **DATA IN CONTEXT – SAT ONE** | Characteristics and shapes of distributions  (histograms, stem plots, dot plots) | Five-number summary and box plots  (including symmetry and skewedness)  **FOLIO ONE** |
| **Week 6** | Five-number summary and box plots continued | **FOLIO ONE** | **TOPIC FIVE: MEASUREMENT**  Review linear measurement   * Units * Conversion between the units km, m, cm and mm. Cover inches feet and miles if relevant to students * Devices for Measurements * When to use estimates for measurements |
| **Week 7** | **Practical Activity –** estimation of distances  *(See support materials for activity)*  Errors in measurement   * Absolute errors * Relative errors | Calculating perimeter – Triangles, squares, rectangles, with and without technology | Calculating perimeter – Triangles, squares, rectangles, with and without technology  Circumference of circles – introduced through a practical measuring activity |
| **Week 8** | Problems involving circumference of circles (including rearranging the formula to find unknown radius/diameter) | Perimeter of more complex shapes (including composite shapes) | Area – What are the appropriate units for area and how do we convert between them? (Including metric to imperial)  How can we calculate areas using grids as well as formulas for shapes such as squares, rectangles, triangles with and without using technology? |
| **Week 9** | **Practical activity** – Investigating the area of a circle | Calculating the area of circles with and without technology | Finding the area of composite shapes  (Heron’s Formula if time) |
| **Week 10** | Discussion of the concepts of mass and weight  Units for mass and conversion between them (tonnes, kg, gm, mg)  **Practical activity** – Estimation of the mass of objects | Relationship between volume and capacity  Units for volume and capacity and conversion between them (kL = m3, litres, ml = cm3)  Estimating volume – practical activity and discussion of the difficulties involved in estimating volume in everyday situations (e.g. selecting an appropriate container for storing left-overs in a cooking pot) | Calculating the volume of cubes, prisms and cylinders  Using formulae (with and without technology) to solve problems posed in practical contexts |
| Term Four  **Week 1** | **FOLIO TWO**  **Designing and Costing a Deck** | Discussion of the connection between energy and power  Understanding energy – units, where they are used, and basic calculations (watts, kilowatts, megawatts, and gigawatts) | Kilowatt hours and the conversion from watts to kilowatt hours  Class watch *(BBC1)* program *Human Power Station* and discuss the connection between human energy and electrical power |
| **Week 2** | **FOLIO TWO**  **Designing and Costing a Deck** | Investigation of energy rating labels on electrical appliances. Utilise the information on average electricity tariffs for each state, and example energy consumption calculations at  [www.energyrating.gov.au](http://www.energyrating.gov.au). | Calculations of the costs of electricity to a house   * Daily supply charge * Tariff   Electricity bills which include solar feed-in tariffs could be looked at and discussed (the solar feed-in tariffs should not be included in any calculations required of the students). |
| **Week 3** | **FOLIO TWO**  **Designing and Costing a deck** | **TOPIC SIX: INVESTING**  Why do we save?  Calculating simple interest (with and without technology) | Simple interest – Rearranging the formula to find principal, interest and time invested in years |
| **Week 4** | Calculating simple interest using spreadsheets | Investigation into understanding the differences between simple and compound interest | Compound interest   * Using the formula to calculate amount accrued * Rearranging the formula and to find principal |
| **Week 5** | Impact of changing the number of compounding periods per year | Using technology to calculate amount accrued, principal, rate and time | Using technology to calculate amount accrued, principal, rate and time, including an in-depth look at the impact of changing principal, interest rate and time  Compound interest using spreadsheets |
| **Week 6** | Looking at simple interest verses compound interest graphically | REVISION | **INVESTING – SAT TWO** |
| **Week 7** | Exam week  *If students are continuing on to Stage 2 Essential Mathematics, undertaking an exam would be good preparation for the Stage 2 examination.* | | |