**Stage 1 Essential Mathematics – Numeracy Program 1**

This program is designed to be completed in one semester. However, flexibilities in this program could enable students to proceed through the course at an accelerated pace, or be extended over a full year for those students who need extra time to achieve the numeracy requirement.

The focus is on collecting evidence that demonstrates learning when students are ready. Evidence will be collected to form one Skills and Applications assessment in Topic 1.

**Topic 1**

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| **Subtopic** | **Content** | **Assessment** |
| **1.1: Calculations** | **How can basic mathematics skills help us in our everyday lives?**   * solve practical problems requiring basic number operations * apply arithmetic operations according to their correct order | **Skills and Applications Task 1**  Section 1 – Provides evidence of ability to perform basic operations without the use of a calculator.   * Multi digit addition and subtraction * Single and double digit multiplication * Single digit division |
| **How can we determine the reasonableness of our calculations?**   * use leading-digit approximation to obtain estimates of calculations * apply approximation strategies * ascertain the reasonableness of answers to arithmetic calculations * check results of calculations for accuracy * multiplication and division by multiples of 10 | **Skills and Applications Task 1**  Section 2 – Provides evidence of ability to perform basic rounding to a leading digit to estimate arithmetic calculations without use of technology.  Calculators are then used within this section to check the accuracy. |
| **Understanding and using decimal numbers.**   * recognise the significance of place value after the decimal point * round up or round down numbers to the required number of decimal places * solve practical problems requiring basic number operations involving decimals | **Skills and Applications Task 1**  Section 3 – Provides evidence of the ability to round simple decimal numbers appropriately and to operate on simple decimal numbers in everyday contexts.   * Introduction of worded problems * Without access to calculator |
| **How can a calculator be used to carry out multi-step calculations?** | Appropriate and effective use of calculators is the focus in problems involving multiple steps. This could be extended to use of spreadsheets which will be utilised in the Folio task later in the program. |
| **1.2: Time and rates** | **Estimate and calculate time:**   * use units of time, conversions between units, fractional, digital, and decimal representations * represent time using 12-hour and 24-hour clocks * calculate time intervals, such as time between, time ahead, time behind | **Skills and Applications Task 1**  Section 4 – Provides evidence of the ability to perform conversions between time representations and use timetables.  This section could be extended into estimation of duration of journey by plane, including understanding and ability to consider time zone differences. (The context could be varied to support local expertise or opportunities). |
| **How can we use rates to make comparisons?**   * use rates to make comparisons and to solve problems | **Skills and Applications Task 1**  Section 5 – Problems requiring conversion of prices to a unit price to enable comparisons between products. Students then use this information to determine the best buy. Questions requiring students to discuss the appropriateness of their choice given considerations such as wastage. |
| **1.3: Ratio and Scale** | **What is a ratio and how do we use them to solve problems?**   * the relationship between fractions and ratio * express a ratio in simplest form * find the ratio of two quantities * divide a quantity in a given ratio | **Skills and Applications Task 1**  Section 6 – Provides evidence of the ability to express two quantities as a ratio and to express that ratio in the simplest form. |
| The six sections above are presented in a single booklet to the students. Students complete one section at a time as they complete the learning for each section. These combine to form the collection of evidence that is **Skills and Applications Assessment 1**. |
| **How does a scale factor work?**   * Scale factor * Scale diagrams * Calculation of actual and scale distances | **Folio 1:** A practical activity in which students create a scaled diagram of their bedroom (or another room in their house), then create scaled cut-outs of items (chosen from catalogues or a visit to a furniture store) to furnish their room. Two designs are constructed and justification of which is the better design is included in the individual response. **Maximum of 6 A4 pages.** |

**Topic 2: Earning and Spending**

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| **Subtopic** | **Content** | **Assessment** |
| **2.2: Spending** | **How can a percentage be expressed as a decimal or fraction?**  **How can the calculation of a percentage provide us with information?**   * finding a percentage of a given amount * determining one amount expressed as a percentage of another   **What impact do percentage increases and decreases have on the price of goods and services?**   * percentage increases and decreases * calculations involving mark-ups, discounts, GST. |  |
| **2.1 Earning** | **In which different ways can income be earned and received?**  Salary  Wages  Hourly paid  Commission  Piecework | **Folio 2:**  Pizza shop telephone order operator.  Students investigate two scenarios of earning income and determine which option would be the best.     * Paid per hour * Paid per order taken   Calculations are carried out by hand for the first week of data, and then a spreadsheet is created to investigate the earnings over a 4 week period of time.  An option to extend the task is provided with a brief scenario on earning by commission.   * Paid on commission (retainer plus % orders)   Students discuss which of the options investigated would be best under different circumstances. |

**Topic 3: Geometry**

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| **Subtopic** | **Content** | **Assessment** |
| **3.1: Shapes** | **How do we identify and classify different 2D shapes?**   * naming of 2D shapes * classification of shape as regular or irregular * classification and naming of different triangles (e.g. equilateral, isosceles, scalene, right-angled) * naming of different representations of circles (e.g. semicircle and sector) |  |
| **How do we identify and classify different 3D shapes?**   * naming of 3D shapes * classification of 3D shapes (e.g. prisms, pyramids, sphere, cone) * properties of prisms * properties of pyramids |  |
| **3.3: Geometry and Construction** | **How do we use mathematical equipment to construct geometrical figures?**   * construction techniques for lines * construction techniques for angles | **Skills and Applications Task 2**  Accessing the Maths Open Reference website at the following hyperlink [www.mathopenref.com/constructions.html](http://www.mathopenref.com/constructions.html) , students complete a set of constructions leaving construction marks in place as evidence of technique. This will be provided to students as an assignment style task in which students complete the constructions at their own pace. |
| **How do we use mathematical equipment to construct geometrical shapes?**   * construction of triangles (e.g. equilateral, isosceles, scalene, right-angled) * constructions involving circles * construction of a variety of polygons |