**Teaching and Learning Program for the Elements**

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| **T:\Office\Graham Moore\jpeg sentral logo.jpg** | **Teaching and Learning Program** | | | | | | | | | | | | | | | | |
| **Title/Type of Unit: Fractions**  **Program Risk Level:** | | | | | | | | | | | **Duration: 10 Weeks**  **By** | | | | | |
| **Syllabus Outcomes**  **Stage 4** | *A student:*  MA4-1WM  communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols  MA4-2WM  applies appropriate mathematical techniques to solve problems  MA4-3WM  recognises and explains mathematical relationships using reasoning  MA4-5NA  operates with fractions, decimals and percentages | | | | | | | | | | | | | | | | |
| **Connectedness**  **Why does this learning matter?** | **Students learn to:**   * Compare [fractions](https://syllabus.bostes.nsw.edu.au/glossary/mat/fraction/?ajax) using equivalence; locate and represent positive and negative fractions and mixed [numerals](https://syllabus.bostes.nsw.edu.au/glossary/mat/numeral/?ajax) on a [number line](https://syllabus.bostes.nsw.edu.au/glossary/mat/number-line/?ajax) (ACMNA152) * determine the [highest common factor](https://syllabus.bostes.nsw.edu.au/glossary/mat/highest-common-factor/?ajax) (HCF) of numbers and the lowest common [multiple](https://syllabus.bostes.nsw.edu.au/glossary/mat/multiple/?ajax) (LCM) of numbers * generate [equivalent fractions](https://syllabus.bostes.nsw.edu.au/glossary/mat/equivalent-fractions/?ajax) * write a fraction in its simplest form * express improper fractions as mixed numerals and vice versa * Solve problems involving addition and subtraction of fractions, including those with unrelated [denominators](https://syllabus.bostes.nsw.edu.au/glossary/mat/denominator/?ajax) (ACMNA153) * add and subtract fractions, including mixed numerals and fractions with unrelated denominators, using written and calculator methods * recognise and explain incorrect [operations](https://syllabus.bostes.nsw.edu.au/glossary/mat/operation/?ajax) with fractions, eg explain why 23+14≠37 (Communicating, Reasoning)LCCT * interpret fractions and mixed numerals on a calculator display (Communicating) CCT * subtract a fraction from a [whole number](https://syllabus.bostes.nsw.edu.au/glossary/mat/whole-number/?ajax) using mental, written and calculator methods, eg 3−23=2+1−23=213 * Connect fractions, decimals and [percentages](https://syllabus.bostes.nsw.edu.au/glossary/mat/percentage/?ajax) and carry out simple conversions (ACMNA157) * convert fractions to decimals (terminating and recurring) and percentages * convert terminating decimals to fractions and percentages * convert percentages to fractions and decimals (terminating and recurring) | | | | | | | | | | | | | | | | |
| **Background and Key Ideas** | There are many everyday situations where things, amounts or quantities are 'fractions' or parts (or 'portions') of whole things, whole amounts or whole quantities. Fractions are very important when taking measurements, such as when buying goods (eg three-quarters of a metre of cloth) or following a recipe (eg a third of a cup of sugar), when telling the time (eg a quarter past five), when receiving discounts while shopping (eg 'half price', 'half off'), and when sharing a cake or pizza (eg 'There are five of us, so we'll get one-fifth of the pizza each'). 'Decimals' and 'percentages' represent different ways of expressing fractions (and whole numbers), and so are other ways of representing a part of a whole. Fractions (and decimals and percentages) are of fundamental importance in calculation, allowing us to calculate with parts of wholes and to express answers that are not whole numbers, eg 4÷5=4/5 (or 0.8 or 80%). | | | | | | | | | | | | | | | | |
| **Literacy Continuum** | Reading Texts | Comprehension | | | Vocabulary Knowledge | | Aspects of Writing | | Aspects of Speaking | | | | Phonics | Phonemic Awareness | | | Concepts About Print |
| Literacy is addressed in this unit through the writing of mathematical definitions and the solving of word problems, however, literacy is not the main focus of this unit of work. | | | | | | | | | | | | | | | | |
| **Numeracy Continuum** | Counting Sequences | | Counting as Problem Solving | | | Pattern and Number Structure | | Place Value | | | Multiplication and Division | | | | Fraction Units | | Length, Area and Volume |
| Aspect 6  All activities engaged students in tasks that were directly related to the numeracy continuum and their own level of understanding. | | | | | | | | | | | | | | | | |
| **Quality Teaching** | | | | | | | | | | | | | | | | | |
| **Intellectual Quality** | | | | **Quality Learning Environment** | | | | | | **Significance** | | | | | | | |
| * IQ1 Deep Knowledge * IQ2 Deep Understanding * IQ3 Problematic Knowledge * IQ4 Higher-order Thinking * IQ5 Metalanguage * IQ6 Substantive Communication | | | | * QLE1 Explicit Quality Criteria * QE2 Engagement * QE3 High Expectations * QE4 Social Support * QE5 Students’ Self-regulation * QE6 Student Direction | | | | | | * S1 Background Knowledge * S2 Cultural Knowledge * S3 Knowledge Integration * S4 Inclusively * S5 Connectedness * S6 Narrative | | | | | | | |
| **Teaching and Learning Lesson Overview** | | | | | | | | | | | | | | | | | |
| **The Elements of Learning & Achievement**    F:\Mock ups\Square elements\Numeracy.jpg    E:\Final V1\Final sq NO border\Sq Technology no bdr.jpg | Students are to complete each activity in their workbook then engage within the online Mathletics activities.    Fractions (Mathletics pp. 1–8)   * fractions of shapes * fractions of a collection * comparing and ordering fractions   Types of fractions (Mathletics pp. 9–16)   * equivalent fractions * mixed numerals and improper fractions   Fractions, decimals and percentages (Mathletics pp. 17–25)   * tenths * tenths and hundredths * place value to thousandths * percentages   Calculating (Mathletics pp. 26–34)   * adding and subtracting fractions with like denominators * adding and subtracting fractions to and from a whole * adding and subtracting fractions * adding decimal fractions   **Students are to complete each activity in their workbook then engage within the online Mathletics activities.** | | | | | | | | | | | | | | | **Aboriginal 8 Ways of Learning**  *The following ways of learning are incorporated throughout the program through pedagogical practices*  2_maps.jpg  Learning Maps  4_symbol.jpg  Symbols & Images  7_deconstruct.jpg  Deconstruct/ Reconstruct  6_non-linear.jpg  Non-Linear | |
| **Special Needs Adjustments** | | | | | | | **School to Work** | | | | | | | | | | |
| Extra support given to students in need of it.  The work consist of a variety of activities aimed at different types of learning.  Age stage appropriate work.  Work designed to engage learners as it is altered for their interests.  Students’ work adjusted to meet their personal learning plans goals and outcomes. | | | | | | | This unit develops students’ mathematical skills in basic operations. These skills are used in most occupations. | | | | | | | | | | |
| **Assessments** | | | | | | | | | | | | | | | | | |
| Formative:  Student work samples, Student responses to discussion and questioning, student participation in whole class activities eg. whiteboard and group activities  Summative:  Mathletics online activities. | | | | | | | | | | | | | | | | | |
| Roles and Responsibilities | | | | | | | | | | | | | | | | | |
| Teacher | | | | SLSO | | | | | | Student | | | | | | | |
| Lesson Planning  Student  Behaviour Support  Class Instruction  Resource Preparation | | | | Teacher Support  Student Support, both individually and in small groups  Behaviour Support (under teacher supervision)  Resource Preparation | | | | | | Participation in all activities  To develop both academic and social skills | | | | | | | |

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| **Teacher Evaluation**  **Comments / Variations** | |
| Guiding Questions  What worked well?  The multimodal approach to numeracy in this unit meant that students all could engage within task according to their ideal learning environment. This made the unit on Fractions very easy to teach as it could provide a variety of tasks to students at any given time.  What needed to be changed?  N/A  What do I think the students gained from this lesson?  Student should have an understanding that fractions are part of a whole number and they can be implemented or used in a variety of real life situations. From this unit students should know what a fraction is, equivalent fractions, improper fractions, mix numerals and the relationship between fraction, decimals and percentages.  How well did this unit match the Elements of Learning and Achievement?  This unit of incorporated several Elements of Learning and Achievement as Fractions are an essential part of daily life. Students had an opportunity to engage in this unit by completing activities with an ICT focus and real life situations so that the relevance for them post schooling was extremely obvious.  What did I learn?  There needs to be a variety of learning activities and resources that are varied and interactive. This enables students to have a variety of learning opportunities to demonstrate their learning and understanding.  How will I use this experience to extend my practice in the future?  I will always ensure that each mathematics unit of study is well resourced. Furthermore, it is also essential that assessing student learning is ongoing in order to progress them to achieving more complex tasks. | |
| **Date Commenced**: | **Date Finished**: |
| **Teachers Signature**: | **Assistant Principals Signature**: |