**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: Patterns & Algebra**  **Program Risk Level: Low** | | | | | | | | | | **Duration: 10 weeks**  **By** | | | | |
| **Syllabus Outcomes**  **Stage** | *A student:*   * MA5.2-6NA - develop efficient strategies for numerical calculation, recognise patterns, describe relationships and apply algebraic techniques and generalisation * MA5.2-9NA - develop efficient strategies for numerical calculation, recognise patterns, describe relationships and apply algebraic techniques and generalisation | | | | | | | | | | | | | | |
| **Connectedness**  **Why does this learning matter?** | **Students learn to:**   * Add, subtract, multiply and divide expressions containing variables * Draw Linear and Nonlinear graphs | | | | | | | **Students learn about:**   * Algebraic techniques * Substitution * Grouping symbols * Expanding * Factorising | | | | | | | |
| **Background and Key Ideas** | Key Idea: Patterns & Algebra  Students will develop their understanding of algebra through a series of tasks. Students already have a sound background on number and number operations making the transition to algebra relatively easier. Key ideas include;   * To engage students in numeracy and broaden their understanding of mathematical concepts in relation to the curriculum and work readiness * To increase students numeracy levels in regards to different number concepts * To increase comprehension skills and mental computation | | | | | | | | | | | | | | |
| **Literacy Continuum** | Reading Texts | Comprehension | | Vocabulary Knowledge | | Aspects of Writing | | | Aspects of Speaking | | | Phonics | Phonemic Awareness | | Concepts About Print |
| Clusters: (individual or range)  Activities linked to program to increase learning: | | | | | | | | | | | | | | |
| **Numeracy Continuum** | Counting Sequences | | Counting as Problem Solving | | Pattern and Number Structure | | Place Value | | | Multiplication and Division | | | | Fraction Units | Length, Area and Volume |
| Elements: (individual or range)  Activities linked to program to increase learning: | | | | | | | | | | | | | | |

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| **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 | ***Everyday students complete at least two pages of the multiplication and division booklet based on their ability. This goes towards evidence for the Numeracy Continuum – Multiplication and Division.***  [***Multiplication and Division (Basic)***](file:///\\Detnsw.win\5583\Faculty\Teacher\2016%20Programs\Term%202\Stage%205\Maths\M&D_Basic.pdf)  [***Multiplication and Division (Advanced)***](file:///\\Detnsw.win\5583\Faculty\Teacher\2016%20Programs\Term%202\Stage%205\Maths\M&D_Advanced.pdf)  **Weeks 1-5**  **Patterns and Algebra**  Begin with [Patterns and Algebra](file:///\\Detnsw.win\5583\Faculty\Teacher\2016%20Programs\Term%202\Stage%205\Maths\DevMath1_p084-097_chapter%2007.pdf) as a lead in to the more advanced work. It includes hands on activities.  Based on the results and observations of Patterns and Algebra student can move on to;  [Algebraic Techniques](file:///\\Detnsw.win\5583\Faculty\Teacher\2016%20Programs\Term%202\Stage%205\Maths\DevMath1_p226-240_chapter%2016.pdf) (Basic) OR  [Simplifying Algebra](file:///\\Detnsw.win\5583\Faculty\Teacher\2016%20Programs\Term%202\Stage%205\Maths\Simplifying%20Algebra.pdf) (Advanced)  *\*please note that Simplifying Algebra is still set at a stage 4 level, although it does cover some stage 5 syllabus outcomes. Students may be able to move on to* [*Simplifying Algebra*](file:///\\Detnsw.win\5583\Faculty\Teacher\2016%20Programs\Term%202\Stage%205\Maths\Simplifying%20Algebra_stage5.pdf) *(stage 5)*  **Weeks 6-10**  **Linear and Non Linear Graphs**  This subject area is quite difficult. Start with the [Number Plane](file:///\\Detnsw.win\5583\Faculty\Teacher\2016%20Programs\Term%202\Stage%205\Maths\The%20Number%20Plane.pdf) (stage 3)  Students may then be able to move onto  [Linear Relationships](file:///\\Detnsw.win\5583\Faculty\Teacher\2016%20Programs\Term%202\Stage%205\Maths\Linear%20Relationships.pdf) (Basic)  [Simple Non-Linear graphs](file:///\\Detnsw.win\5583\Faculty\Teacher\2016%20Programs\Term%202\Stage%205\Maths\Simple%20Non%20Linear%20Graphs.pdf) (Advanced)  Week 8 – [Assessment Task](file:///\\Detnsw.win\5583\Faculty\Teacher\2016%20Programs\Term%202\Stage%205\Maths\Maths%20Assessment.docx) | | | **Aboriginal 8 Ways of Learning**  *The following ways of learning are incorporated throughout the program through pedagogical practices*  4_symbol.jpg  Symbols & Images  7_deconstruct.jpg  Deconstruct/ Reconstruct  6_non-linear.jpg  Non-Linear    Non-Verbal |

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| **Special Needs Adjustments** | | | | **School to Work** | | |
| * All students start at base level and move according to ability * Write down the method using butcher paper to assist with understanding * Recap previous days lesson to ensure understanding | | | | Students continue to work on their basic operational skills with the addition of letters. | | |
| **Assessments** | | | | | | |
| An assessment task will be given in week 8 to test all the mathematical concepts learnt. | | | | | | |
| Roles and Responsibilities | | | | | | |
| Teacher | | SLSO | | | Student | |
| * Work with students in small groups * Ensure teaching and learning strategies are appropriate * Collect data * Assess students work and make reasonable adjustments | | * Work with students either one on one or in small groups * Ensure resources are available to complete set work | | | * Engage in all topics * Complete set work * Complete assessment in week 8 | |
| **Risk Assessment – Dorchester ETU only** | | | | | | |
| **Resources** | **Safety Strategies** | | **Identified Hazards** | | | **Control Strategies** |
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| **Teacher Evaluation**  **Comments / Variations** | |
| This program worked well. It was well structured and was able to suit a number of students based on their ability to understand previous tasks. Students were able to be exposed to algebra and linear and non-linear graphs at a level that was achievable and could progress to higher levels based on their ability.  It provided students with an opportunity to engage in practical numeracy skills – addition, subtraction and multiplication. Furthermore, it demonstrated their ability to apply practical strategies to more complex mathematical equations.  This program was easy to deliver and the students found the content challenging but achievable. | |
| **Date Commenced**: 19 April | **Date Finished**: 29 June |
| **Teachers Signature**: | **Assistant Principals Signature**: |