|  |  |
| --- | --- |
|  | **Dorchester School Teaching and Learning Program** |
| **Working Mathematically through Maths Relay and Problem Solving Games****Program Risk Level: Low** | **Duration: Term 4, 2015****By Ernie** |
| **Syllabus Outcomes****Stages 4 & 5** | *A student:*MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols MA4-2WM applies appropriate mathematical techniques to solve problems MA4-4NA compares, orders and calculates with integers, applying a range of strategies to aid MA4-15MG Performs calculations of time that involve mixed units, and interprets time zones MA4-6NA Solves financial problems involving purchasing goods MA4-12MG Calculates the perimeters of plane shapes and the circumferences of circles MA5.1-2WM Selects and uses appropriate strategies to solve problems MA5.1-4NA Solves financial problems involving earning, spending and investing moneyMA5.3-3WM Uses deductive reasoning in presenting arguments and formal proofsMA5.1-8MG Calculates the areas of composite shapes, and the surface areas of rectangular and triangular prisms  |
| **Connectedness****Why does this learning matter?** | **Students learn to:*** develop process skills in mathematics, such as thinking, selecting strategies, teamwork, checking and reflecting.
* develop and demonstrate perseverance in undertaking mathematical challenges
* respond to familiar and unfamiliar situations by employing strategies to make informed decisions and solve problems relevant to their further education and everyday lives.
 | **Students learn about:*** problem solving techniques including guess and check, using reasoning, working systematically, looking for a pattern, drawing a diagram, making a simpler problem, making a model, acting it out, making a chart or table, working backwards and comparing with similar problems.
* perseverance ‘If at first you don’t succeed try again’
 |
| **Background information/ links** | To provide students a fun, positive learning environment where they can be both supported and challenged with problem solving activities and games. Students to develop deeper knowledge, further skills and understanding in mathematics through inquiry, exploring and connecting mathematical concepts, and choosing and applying problem solving skills and mathematical techniques. Students learn to work together, make decisions together and be respectful of each others input.  |
| **Key Ideas** | The problem solving activities and the co-operative and competitive games will encourage inclusion, turn taking, cooperation, learning and confidence. Students will develop their own problem solving strategies as well as expose them to specific strategies including;* guess and check, looking for a pattern
* drawing a diagram, making a model, acting it out
* making a chart or table
* working backwards and comparing with similar problems
 |
| **Scope and Sequence and Lesson Structure** |
| **The Elements of Learning & Achievement**F:\Mock ups\Square elements\Numeracy.jpgE:\Final V1\Final sq NO border\Sq Technology no bdr.jpg | **1: Introduction –– Maths Relays (Odd Weeks)*** Problems are introduced on a regular basis in class time and students are provided an opportunity to discover the various strategies for themselves. The strategies are shared and discussed and practised.

**2: Body/Lessons*** Students are placed into mixed ability groups with two members of the teaching and/or unit staff in each team to provide support and scaffolding.
* Maths relay activities and resources are allocated to each team
* Each group is to attempt as many questions as possible. As soon as an answer is obtained for any question, a person from the group is to submit it to the teacher, giving the group number first, the question number next and then the answer. Provided the answer is correct, the group will be awarded the points allocated to that question. The group with the most points accumulated by the end of the session is declared the winner.

**3: Conclusion*** Time is provided for sharing approaches, solutions and difficulties while solving the problems and during a post problem solving session.

**Introduction –– Problem Solving Games (Even Weeks)*** Students are introduced to games and rules. Games are placed into various stations with some games to be co-operative and others competitive.

**2: Body/Lessons*** Students are placed into pairs of like ability. Students rotate through games with each activity and game allocated points. Provided the activity is completed or there is a certain winner the individual or pair will be awarded the points allocated to that activity or game. The individual with the most points accumulated by the end of the session is declared the winner.

**3: Conclusion*** Time is provided for sharing approaches, solutions and difficulties while solving the problems and during a post problem solving session.
 | **Aboriginal 8 Ways of Learning***The following ways of learning are incorporated throughout the program through pedagogical practices*2_maps.jpgLearning MapsNon-Verbal4_symbol.jpgSymbols & Images7_deconstruct.jpgDeconstruct/ Reconstruct6_non-linear.jpgNon-Linear |
| **Special Needs Adjustments** | **School to Work** | **Assessments** |
| * Demonstration of key concepts.
* Appropriate resources to support teaching and learning
* Individual assistance
* Classroom organisation (groups)
* Post-problem solving session
* Being receptive to partial solutions
 | With small groups of learners working together as a team to solve a problem, complete a task, or accomplish a common goal they will develop improved skills in working with others. | * Discussion and Sharing
* Observation
* Student comments
 |
| **Risk Assessment** |
| **Resources** | **Safety Strategies** | **Identified Hazards** | **Control Strategies** |
| Board Games:Gobblet Gobblers,Make 7, Math Dice KitPlayings Cards, TangramsPaddle pop sticks4 Across ChessOperation GamesiPads | Count In and Count Out | Behaviour IssuesBeing receptive to partial solutionsProviding time for sharing approaches, solutions and difficulties | Individual Risk AssessmentAdditional StaffBeing alert to frustration levels |
| **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
 |

|  |  |
| --- | --- |
| **Teacher Evaluation** | **Comments / Variations / Evaluation** |
| ***How did the unit ‘rate’ in these areas?*** | j0079104 | j0079099 | j0079100 |  |
| Time allocated for topic |  |  |  |
| Introduction to topic |  |  |  |
| Student understanding of content |  |  |  |
| Opportunities for student reflection on learning |  |  |  |
| Suitability of resources |  |  |  |
| Variety of teaching strategies |  |  |  |
| Integration of Quality Teaching strategies |  |  |  |
| Integration of ICT |  |  |  |
| Literacy strategies used |  |  |  |
| Numeracy strategies used |  |  |  |
| Student Behavioural Goals |  |  |  |
| **Date Commenced**:  | **Date Finished**:  |
| **Teachers Signature**: | **Assistant Principals Signature**: |