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| **Student(s) Name(s)/ ARCOTS Code**: | | | |
| **Date :** | | | |
| **Developmental Domain** | **Progression of Numeracy**  **Strand: Number** | | |
| **Developmental Level & Nutshell Statement** | **Level L**  **Use polynomial identities’ and properties of exponents to simplify algebraic expressions. Use exponential and logarithmic functions. Find function domain and intercept with the axes, minimum, maximum and turning point. Calculate with exponential, polynomial, rational, logarithmic and periodic functions.** | | |
| **Evidence for this level?** (What makes you say this? | ARCOTS testing student ZPD was Level L. Analysis of work samples against the progression confirmed this. | | |
| ***What is the student ready to learn?*** | ***What are the expected outcomes and evidence?*** | ***What interventions has the teacher planned?*** | ***What worked? What next?*** |

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| **Learning Intention/s**  (Specific **skill** or concept or part thereof to be learned) | **Evidence** (What the students will be able to do, say, make or write): | **Teaching Strategy** (What the *teacher* says, does, makes or writes) | **Learning Activity**  (Describes what the students are actually going to do) | **Resources** (People, place or things used in the activity to realise the learning strategy) | **Review & Reflection** |
| Students will be able to find function domain and intercepts with the axes, minimum, maximum and turning point of a quadratic function. | - Students locate function domain and intercepts with the axes, minimum, maximum turning point of a quadratic function. | ***MIDDLE and UPPER YEARS***  ***Expositive***  • Teacher will:   * Revise Linear Equation graphing (Level J). * Revise factorisation of quadratic equations. * Introduce factorisation by completion of square or using formula. * Introduce standard parabola formula/shape.   ***Individualistic/Interrogative***  • Teacher introduces the worksheet with learning activities to students, explaining the tasks for students.  • Upon student completion teacher conducts debrief around some key questions:   * What is the general shape of the graph of a quadratic function or parabola? * What effect does the value of 'a', the coefficient of the squared term, have on the shape of a parabola? * What does a parabola look like when 'a' is positive, and what does it look like when 'a' is negative? * What is the effect on the position of a parabola when a constant is added or subtracted to the basic parabola, ***y***= ***x²***? * What is the axis of symmetry and how does its location relate to the location of the **x-**intercepts? * How can the equation of the axis of symmetry be determined? | ***MIDDLE and UPPER YEARS***  • Activities for students to physically manipulate materials to explore the concept of balancing, expanding or factorising.  • Matching Activities to compare the expanded and the factorised versions of an algebraic expression.  • Worksheet with different learning tasks:  - 5 graphs of standard quadratic being moved up, down, left or right, students write equation for each.  - Give 5 equations (of standard quadratic that have been shifted up, down left or right), students to sketch 5 graphs.  - Relating squared and number terms to graphs. 5 graphs, giving 4 alternative equations for each graph (suggest 1 graph upside down with turning point at origin, 1 upside down with x intercepts both positive integers, 1 upside down with x intercepts both negative1 right way up with x intercepts a positive and a negative integer , 1 right way up with x intercepts both positive integers). Students work out which of the alternatives is the correct one for each graph by guessing with reasons or by factorising etc.  - 5 equations (with x & y variables) to factorize using the ‘cross over’ method or quadratic formula or ‘completion of square’.  - Students to accurately graph each of the above equations marking important points. | • Teachers can access to Ultranet eBookbox ‘Introducing Quadratic Functions’ where different interactive activities are available to work through this learning intention. The learning activities under the following headings are suitable for the PLT Log’s learning intention: Introducing the Parabola.Transformations of the basic parabola.   • Worksheet with the learning activities described. | **Review Date:**  **Reflection:** |
| **Rationale:** | Differentiated context, the activities proposed on the first line can be more suitable for junior years’ students. In turn, the activities on the second line can be more suitable for middle and upper years’ students.  The PLT Log references an eBook box (‘Introducing Quadratic Functions’) which is available on the Ultranet as Design Space 66512121. The activities in the eBook box should be allocated to students according to the teacher’s knowledge. | | | | |

Was the teaching intervention successful?

If yes, what, if anything would the PLT do differently? If no, why not?