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| **Student(s) Name(s)/ ARCOTS Code**: | | | |
| **Date :** | | | |
| **Developmental Domain** | **Progression of Numeracy**  **Strand: Number** | | |
| **Developmental Level & Nutshell Statement** | **Level H –**  Use proportional relationship to solve problem including discounts, taxes and interest rates. Represent, analyse, and generalise different patterns using tables, graphs and symbolic rules. Relate and compare different forms of representation for a relationship. Solve an inequality involving fractions. | | |
| **Evidence for this level?** (What makes you say this? | ARCOTS testing student ZPD was Level H. 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 understand that Cartesian plots, tables of values and algebraic rules are all equivalent ways of representing the same mathematical relationship. | - Students represent a mathematical relationship using Cartesian plots, tables of values and algebraic rules.  - Students describe why the Cartesian plots, tables of values and algebraic rules are equivalent ways of representing the same mathematical relationship.  - Students set up tables of values, plot graphs and uses sequences to display a mathematical relationship. | ***JUNIOR YEARS***  ***Associative/Performative***  • Teacher will:   * Ask students to think in real life examples of methods to locate people. * Introduce ‘battle ships & cruiser’ game and explains the use of the grid.   ***Associative/Expositive***  • Teacher will:   * Explain convention of x and y axes (and graduations) and why they are used in mathematics (non scale for convenience). * Review the idea of input/output machine to generate ordered pairs, sets activities for students to complete and to locate points defined by listed instructions. * Draw set of points from a table into a graph (to show a relationship between the tables and the graphs)   • Teacher hold review of learning when students have completed tasks. | ***JUNIOR YEARS***  • Students to give examples of methods of locating people/objects.  • Students will work in pairs to play ‘Battleships and Cruisers’  • Students will draw shapes on a set of axes, shapes are given with the coordinates of their corners. (The particulars of these shapes can be discussed further and related to the coordinates. Ex; the relationship between a shape with parallel sides and its coordinates.)  • Students need to locate points defined by listed instructions in a worksheet that contains the following axes (with graduations): N and E, Up and Right.  • Students to use tables with x and y. x values and relationship stated. Then they need to fill in corresponding numbers in tables using the relationship statements. | • Prepared grid sheets for ‘battle ships & cruiser’ game.  Prepared pages with numbered axes, some with included shapes others without. • Prepared sheets some with axes’ N’ & ‘E’ and others with ‘Up’ & ‘Right’.• Prepared graph sheets with x & y axes marked. | **Review Date:**  **Reflection:** |
| ***MIDDLE and UPPER YEARS***  ***Expositive***  • Teacher will   * Explain convention of x and y axes (and graduations) and why they are used in mathematics (non scale for convenience). * Review the idea of input/output machine to generate ordered pairs, sets activities for students to complete and then hold review of learning when students have completed tasks.   ***Associative/Investigative***  • Teacher will set an activity for students to use a range of tools such as GPS, Street Directories, atlas, orienteering maps etc. to locate different places and positions.  • Teacher can also use yard or classroom to get students to follow directions.  • Teacher will then discuss about what directions (variables) are involved with each.  ***Individualistic/Investigative***  • Teacher will introduce the graphing, patterns and tables worksheets and challenge students thinking about the tasks with questions such as:   * What is a number pattern? * What is a mathematical relationship? * What are variables and how can we use them? * How can we turn a pattern into a mathematical relationship? * How can we describe and predict mathematical relationships? * What are the different ways in which relationships can be represented? * How do we move between different representations of the same relationship? * How can we use mathematical relationships to model real-life situations?   • Teacher will conduct appropriate debriefing session around key questions | ***MIDDLE YEARS***  • Students locate positions on given maps using directions (relationships between two variables) etc.  ex; direction –distance  distance – time  vertical – horizontal (on a page)  • Graphing worksheet:  - Showing a graph, students need to locate positions of 5 sets of given coordinates.  - Showing a graph containing 5 points, students to work out the ‘coordinates’ of each point.  • Patterns worksheet:  - Students to investigate relationship between numbers, given 5 sequences, students need to identify what is done to each number to get the next number?  (exs; 1, 2, 4, 8  32, 16, 8, 4, 2  5, 8, 11, 14  2, 6, 18, 54  1, 1, 2, 3, 5, 8)  • Tables worksheet:  - Students use 5 tables with x and y. x values already in table and relationship stated. They need to fill in corresponding numbers in tables using the relationship statements and draw each set of points onto a graph. | • Street directories, maps, atlas, etc.  • Worksheet with different positions to locate.  Teachers can access to Ultranet eBookbox ‘Patterns and relationships’ where different interactive activities are available to work through this learning intention: The challengeAttribute trainsFinding patternsExploring number patternsNumber line tool: tutorialNumber line toolTeaching patterns and algebra: resourcesMathematics developmental continuum activitiesVariablesBuilding shapes: lessonFunction machineFunction machines 1Function machines 2Function machines 3Squirt: three containers: level 1 | **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 (‘Patterns and relationships’) 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?