**Mathology 3 and Ontario Ministry of Education Long-Range Plan: by Topic**

|  |  |
| --- | --- |
| **Ontario Ministry Long Range Plan** | **Pearson *Mathology*** |
| **Attributes and Numbers** | **Big Ideas*** **Numbers are related in many ways.**
* **Quantities and numbers can be grouped by or partitioned into equal-sized units.**
* **Assigning a unit to a continuous attribute allows us to measure and make comparisons.**
* **Regularity and repetition form patterns that can be generalized and predicted mathematically.**
* **Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness.**
* **2‐D shapes and 3‐D solids can be analyzed and classified in different ways by their attributes.**
* **Numbers tell us how many and how much.**
 |
| **Time:** 10 days |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
|  |  | Fantastic Journeys - estimate quantities to 1000- compare/order quantities to 1000 |
|  |  | Gallery Tour- describe and compare transformations - identify, describe, and compare 2-D shapes |
|  |  | Goat Island- measure time, temperature, and length- explore units of measure and their relationships |

|  |  |  |
| --- | --- | --- |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |

|  |  |  |
| --- | --- | --- |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
| **Developing an understanding of attributes**D1.1 sort sets of data about people or things according to two and three attributes, using tables and logic diagrams, including Venn, Carroll, and tree diagrams, as appropriateE1.1 sort, construct, and identify cubes, prisms, pyramids, cylinders, and cones by comparing their faces, edges, vertices, and anglesC1.1 identify and describe repeating elements and operations in a variety of patterns, including patterns found in real-life contexts | * *Are students able to identify the changing attributes and the core of a repeating pattern?*
* *Can students extend a repeating pattern involving 2 attributes?*
* *Are students able to create a tree diagram to show all possible combinations?*
* *Are students able to use their tree diagram to determine the number of possible combinations?*
* *Are students able to identify the attributes of the different shapes? Are they able to sort by different attributes?*
* *Are students able to name the shapes of the faces of solids?*
 | Patterning and Algebra Unit 1: Patterns and Expressions1: Describing and Extending PatternsPatterning and Algebra Unit 2: Repeating Patterns10: Sorting with Attributes11: Identifying and Extending Patterns***12: Consolidation (Repeating Patterns*)**Data Management and Probability Unit 1: Data Management1: Sorting People and Things3: Collecting & Organizing DataGeometry Unit 1: 2-D Shapes1: Sorting Polygons3: What’s the Sorting Rule?***5: Consolidation (2-D shapes)***Geometry Unit 2: 3-D Solids6: Exploring Geometric Attributes of SolidsGeometry Unit 4: Angles18: Investigating Angles19: Comparing Angles***20: Consolidation (Angles***) |
| **Counting collections and subsets of collections based on attributes**B1.4 count to 1000, including by 50s, 100s, and 200s, using a variety of tools and strategies | * *Do students say 3-digit numbers without using the word “and”?*
* *Are students able to bridge tens and hundreds when counting on and back?*
* *Are students able to use patterns to help them skip-count forward and backward?*
 | Number Unit 1: Counting1: Numbers All Around Us 2: Counting to 10003: Skip-Counting Forward and Backward***4: Consolidation (Counting)***Number Unit 7: Financial Literacy35: Estimating and Counting Money |
| ***Reflection:*** *How can we organize numbers and shapes?* |

|  |  |
| --- | --- |
| **Ontario Ministry Long Range Plan** | **Pearson *Mathology*** |
| **Number Patterns, Relationships, and Equivalency** | **Big Ideas*** **Quantities and numbers can be grouped by or partitioned into equal-sized units.**
* **Numbers are related in many ways.**
* **Quantities and numbers can be grouped by, and partitioned into, units to determine how many or how much.**
* **Regularity and repetition form patterns that can be generalized and predicted mathematically.**
* **Patterns and relations can be represented with symbols, equations, and expressions.**
* **Quantities and numbers can be added and subtracted to determine how many or how much.**
* **Objects can be located in space and viewed from multiple perspectives.**
 |
| **Time:** 20 days |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
|  |  | How Numbers Work- compose/decompose 3-digit numbers- find and use number patterns |
|  |  | Finding Buster- compose to 1000 based on place value- compare/order numbers to 1000 |

|  |  |  |
| --- | --- | --- |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
| **Using patterns to develop an understanding of relationships among numbers, and multiplication and division facts**C1.4 create and describe patterns to illustrate relationships among whole numbers up to 1000B1.5 use place value when describing and representing multi-digit numbers in a variety of ways, including with base ten materialsB2.2 recall and demonstrate multiplication facts of 2, 5, and 10, and related division facts, proving equivalence of quantitiesC2.2 determine whether given sets of addition, subtraction, multiplication, and division expressions are equivalent or not | * *Are students able to represent numbers with tens and ones?*
* *Do students understand the values of the ones, tens, and hundreds?*
* *Are students able to record numbers in different ways?*
* *Can students use repeated addition to help solve problems involving equal groups?*
* *Can students represent division as equal sharing and equal grouping?*
* *How do students use repeated subtraction, number lines, and arrays to help to divide?*
* *Are students able to write and explain the pattern rule?*
* *Are students able to extend increasing and decreasing patterns?*
* *Are students able to show patterns in different ways?*
* *Can students apply the pattern rule to identify missing terms and errors?*
 | Number Unit 3: Place Value9: Building Numbers10: Representing Numbers in Different Ways11: What’s the Number?***13: Consolidation (Place Value)***Number Unit 6: Multiplication and Division26: Exploring Multiplication27: Exploring DivisionPatterning and Algebra Unit 1: Patterns and Expressions3: Creating Patterns4: Identifying Errors and Missing Terms6: Exploring Multiplicative Patterns7: Patterns in Whole Numbers***9: Consolidation (Patterns and Expressions)*** |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
|  | **Demonstrating and using equivalency to represent, compose, and decompose whole numbers and fractions**B1.1 read, represent, compose, and decompose whole numbers up to and including 1000, using a variety of tools and strategies, and describe various ways they are used in everyday lifeB2.8 represent the connection between the numerator of a fraction and the repeated addition of the unit fraction with the same denominator using various tools and drawings, and standard fractional notationC2.1 describe how variables are used, and use them in various contexts as appropriateC2.3 identify and use equivalent relationships for whole numbers up to 1000, in various contexts | * *Do students vary the location of the unknown in an equation or do they always place it in the same position?*
* *Are students able to use different strategies to solve for an unknown?*
* *Are students able to solve for an unknown using the inverse operation?*
* *Are students able to name a fractional part of a set?*
* *Do students realize that the objects in a set can be different and that the parts do not have to be equal (e.g., can have different numbers of objects in each part)?*
* *Do students write problems of different types? (e.g., result unknown, change unknown, start unknown, compare)*
 | Number Unit 4: Fractions17: Partitioning Sets Number Unit 5: Addition and Subtraction23: Creating and Solving Problems24: Creating and Solving Problems with Larger Numbers |
|  | **Using coding to show equivalent relationships**C3.1 solve problems and create computational representations of mathematical situations by writing and executing code, including code that involves sequential, concurrent, and repeating eventsC3.2 read and alter existing code, including code that involves sequential, concurrent, and repeating events, and describe how changes to the code affect the outcomes | * *Are students able to give clear instructions using positional and directional language to accurately describe a route?*
* *Are students able to interpret language, including the language of position and direction (e.g., up, down, left, right) to follow a route?*
* *Do students realize that there are many different routes to the same location on a map?*
 | Geometry Unit 3: Mapping and Coding11: Describing Location13: Describing Movement on a Map |
| ***Reflection:*** *How can numbers help us with patterns, relationships, and equivalency?* |

|  |  |
| --- | --- |
| **Ontario Ministry Long Range Plan** | **Pearson *Mathology*** |
| **Comparison of Measures and Quantities** | **Big Ideas*** **2‐D shapes and 3‐D solids can be analyzed and classified in different ways by their attributes.**
* **Many things in our world (e.g., objects, spaces, events) have attributes that can be measured and compared.**
* **Assigning a unit to a continuous attribute allows us to measure and make comparisons.**
 |
| **Time:** 25 days |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
|  |  | WONDERful Buildings- identify, describe, and compare 2-D shapes and 3-D solids- compose and decompose 2-D shapes and 3-D solids |
|  |  | Measurement About YOU!- estimate, measure, and compare attributes - identify and relate measures |
|  |  | The Bunny Challenge- estimate, measure, and compare area- estimate, measure, and compare perimeter |

|  |  |  |
| --- | --- | --- |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
| **Comparison of Measures and Quantities****Comparing spatially and identifying congruence**E1.3 identify congruent lengths, angles, and faces of three-dimensional objects by mentally and physically matching them, and determine if the objects are congruentE2.5 use various units of different sizes to measure the same attribute of a given item, and demonstrate that even though using different-sized units produces a different count, the size of the attribute remains the sameE2.7 compare the areas of two-dimensional shapes by matching, covering, or decomposing and recomposing the shapes, and demonstrate that different shapes can have the same areaE2.8 use appropriate non-standard units to measure area, and explain the effect that gaps, and overlaps have on accuracy | * *Are students able to describe the geometric attributes of their solid?*
* *Are students able to recognize real-world examples of their solid?*
* *What strategies are students using to identify the net of their solid?*
* *How are students comparing angles?*
* *Are students able to identify an angle as being a right angle, less than a right angle, or greater than a right angle?*
* *Do students realize that when they combine angles, the angles get bigger?*
 | Geometry Unit 1: 2-D shapes 2: Exploring Congruency***5: Consolidation (2-D Shapes)***Geometry Unit 2: 3-D Solids6: Exploring Geometric Attributes of Solids7: Building Solids8: Constructing Skeletons9: Working with Nets***10: Consolidation (3-D Solids)***Measurement Unit 2: Area, Mass, and Capacity9: Measuring Area Using Non-Standard Units |
| **Comparing measures using non-standard units\***E2.3 use non-standard units appropriately to estimate, measure, and compare capacity, and explain the effect that overfilling or underfilling, and gaps between units, have on accuracyE2.4 compare, estimate, and measure the mass of various objects, using a pan balance and non-standard units | * *Do students minimize gaps and overlaps when covering the shapes?*
* *How do students find the area of the rectangle (e.g., counting all, using skip-counting, using multiplication)?*
* *Are students able to order the measures from least to greatest?*
* *How are students estimating the mass and capacity of an object? Are they using referents? Are their estimates reasonable?*
 | Measurement Unit 3: Area, Mass, and Capacity10: Measuring Area Using Standard Units11: Measuring Mass Using Non-Standard Units12: Measuring Capacity Using Non-Standard Units***13: Consolidation (Area, Mass, and Capacity)*** |

|  |  |  |
| --- | --- | --- |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
| **Comparing measures using standard units**E2.1 use appropriate units of length to estimate, measure, and compare the perimeters of polygons and curved shapes, and construct polygons with a given perimeterE2.2 explain the relationships between millimetres, centimetres, metres, and kilometres as metric units of length, and use benchmarks for these units to estimate lengthsE2.9 use square centimetres (cm2) and square metres (m2) to estimate, measure, and compare the areas of various two-dimensional shapes, including those with curved sidesB1.3 round whole numbers to the nearest ten or hundred, in various contexts**Comparing quantities**B1.1 read, represent, compose, and decompose whole numbers up to and including 1000, using a variety of tools and strategies, and describe various ways they are used in everyday lifeB1.2 compare and order whole numbers up to and including 1000, in various contextsB2.9 use the ratios of 1 to 2, 1 to 5, and 1 to 10 to scale up numbers and to solve problems | * *Are students using the measuring tools correctly?*
* *Do students know the relationships among the different standard units?*
 | Measurement Unit 1: Length, Perimeter, and Time 1: Estimating Length2: Relating Millimetres, Centimetres, Metres, and Kilometres3: Measuring Length4: Introducing Perimeter5: Measuring Perimeter6: How Many Can You Make?***8: Consolidation (Length, Perimeter, and Time)***Number Unit 6: Multiplication and Division33: Investigating Ratios |
| ***Reflection: How can we measure and compare quantities?*** |

|  |  |
| --- | --- |
| **Ontario Ministry Long Range Plan** | **Pearson *Mathology*** |
| **Collection, Organization, Representation, and Analysis of Data, and Introduction to Mathematical Modelling** | **Big Ideas*** **Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness.**
 |
| **Time:** 30 days |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
|  |  | Math Makes Me Laugh- add/subtract to 1000 - estimate, compare, and order numbers to 1000  |
|  |  | Welcome to The Nature Park- interpret charts, tables, pictographs, and bar graphs- draw conclusions from data displays |
| **Collecting, organizing, and representing data**D1.2 collect data through observations, experiments, and interviews to answer questions of interest that focus on qualitative and quantitative data, and organize the data using frequency tablesD1.3 display sets of data, using many-to-one correspondence, in pictographs and bar graphs with proper sources, titles, and labels, and appropriate scales | * *Are students able to write an appropriate survey question with reasonable answers?*
* *How do students collect the data and organize the data?*
* *Do they choose an appropriate scale/key?*
* *Are students able to use the data to make convincing arguments and informed decisions about their feature?*
 | Data Management and Probability Unit 1: Data Management2: Interpreting Graphs3: Collecting & Organizing Data4: Drawing Graphs***6: Consolidation (Data Management)*** |

|  |  |  |
| --- | --- | --- |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
| **Posing a real-life situation that requires the process of mathematical modelling and involves the collection, organization, representation, and analysis of data\***C4 apply the process of mathematical modelling to represent, analyse, make predictions, and provide insight into real-life situations\*\*\* Depending on the situation it may be appropriate to complete the mathematical modelling task now or continue asnew learning is acquired\*\* One aspect of the mathematical modelling process is to identify things that change (variable) and things that remain the same |  |  |
| ***Reflection: How can we collect, represent and analyze data to make informed decisions?*** |
| **Questions and Expectations** | **What to Look For** | **Little Books / Activity** |

|  |  |
| --- | --- |
| **Ontario Ministry Long Range Plan** | **Pearson *Mathology*** |
| **Represent and Solve Problems Involving Addition and Subtraction** | **Big Ideas*** **Quantities and numbers can be added and subtracted to determine how many or how much.**
* **Quantities and numbers can be grouped by, and partitioned into, units to determine how many or how much.**
 |
| **Time:** 35 days |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
|  |  | Calla’s Jingle Dress- multiply and divide to 50- add and subtract to 100 |
|  |  | Planting Seeds- add/subtract to 1000 - develop concept of multiplication |

|  |  |  |
| --- | --- | --- |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
| **Questions and Expectations** | **What to Look For** | **Little Books / Activity** |

|  |  |  |
| --- | --- | --- |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
| C2.1 describe how variables are used, and use them in various contexts as appropriateC3.1 solve problems and create computational representations of mathematical situations by writing and executing code, including code that involves sequential, concurrent, and repeating eventsC3.2 read and alter existing code, including code that involves sequential, concurrent, and repeating events, and describe how changes to the code affect the outcomesE1.4 give and follow multi-step instructions involving movement from one location to another, including distances and half- and quarter-turnsF1.1 estimate and calculate the change required for various simple cash transactions involving whole-dollar amounts and amounts of less than one dollar |  |  |

|  |  |  |
| --- | --- | --- |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
| **Representing multiplication and division, and the inverse relationship between them**B2.1 use the properties of operations, and the relationships between multiplication and division, to solve problems and check calculationsB2.6 represent multiplication of numbers up to 10 × 10 and division up to 100 ÷ 10, using a variety of tools and drawings, including arrays | * *Are students able to write a multiplication/division sentence for an array?*
* *Do students realize that two multiplication sentences and two division sentences are possible for many arrays?*
* *Do students recognize the relationship between multiplication and division?*
* *What strategies are students using to multiply/divide (e.g., using counters, skip-counting, using a number line, using repeated addition/subtraction, using mental strategies, making arrays)?*
* *Are students using the relationship between multiplication and division to help (e.g., knows 6 can be arranged into equal groups of 3 because 2 groups of 3 make 6)?*
 | Number Unit 6: Multiplication and Division26: Exploring Multiplication27: Exploring Division28: Relating Multiplication and Division32: Building Fluency: The Games Room |
| ***Reflection: How can we represent and solve problems using operations?*** |

|  |  |
| --- | --- |
| **Ontario Ministry Long Range Plan** | **Pearson *Mathology*** |
| **Parts and Wholes** | **Big Ideas** * **Quantities and numbers can be grouped by or partitioned into equal‐sized units.**
* **Quantities and numbers can be grouped by, and partitioned into, units to determine how many or how much.**
 |
| **Time:** 20 days |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
|  |  | Hockey Homework- split wholes into equal parts (fractions)- compare fractions |
|  |  | Sports Camp- equal sharing- repeated addition |
| **Developing an understanding that “wholes” can be decomposed into “parts” and “parts” can be recomposed to make “wholes”**E1.2 compose and decompose various structures, and identify the two-dimensional shapes and three-dimensional objects that these structures containB1.6 use drawings to represent, solve, and compare the results of fair-share problems that involve sharing up to 20 items among 2, 3, 4, 6, 8, and 10 sharers, including problems that result in whole numbers, mixed numbers, and fractional amountsB1.7 represent and solve fair-share problems that focus on determining and using equivalent fractions, including problems that involve halves, fourths, and eighths; thirds and sixths; and fifths and tenths | * *Are students able to use different materials to model fractions?*
* *Are students able to flexibly change the whole to show different fractions?*
* *Do students understand that when working with a whole (area or length), the size of the parts must be equal, but when working with a set, the parts don’t have to be equal sizes?*
* *Do students understand that for the same whole, as the number of equal parts increases, the size of each unit gets smaller?*
* *Do students understand the denominator of a fraction tells the number of equal parts in the whole, which tells us the unit. The numerator tells the number of parts counted.*
* *Are students able to write a multiplication/division sentence for an array?*
 | Number Unit 4: Fractions14: Exploring Equal Parts15: Comparing Fractions 116: Comparing Fractions 217: Partitioning Sets***18: Consolidation (Fractions)***Number Unit 6: Multiplication and Division29: Properties of Multiplication30: Multiplying and Dividing Larger Numbers31: Creating and Solving Problem***34: Consolidation (Multiplication and Division)*** |

|  |  |  |
| --- | --- | --- |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
| B2.1 use the properties of operations, and the relationships between multiplication and division, to solve problems and check calculationsB2.2 recall and demonstrate multiplication facts of 2, 5, and 10, and related division factsB2.6 represent multiplication of numbers up to 10 × 10 and division up to 100 ÷ 10, using a variety of tools and drawings, including arraysB2.7 represent and solve problems involving multiplication and division, including problems that involve groups of one half, one fourth, and one third, using tools and drawings | * *Do students recognize the relationship between multiplication and division?*
* *Can students use multiplication and division to help us make sense of real-life situations and to solve problems?*
 |  |
| ***Reflection: How can we use fractions, multiplication and division to make sense of real life situations?*** |

|  |  |
| --- | --- |
| **Ontario Ministry Long Range Plan** | **Pearson *Mathology***  |
| **Patterns and Likelihood of Events** | **Big Ideas*** **Objects can be located in space and viewed from multiple perspectives.**
* **Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness.**
 |
| **Time:** 20 days |
| **Questions and Expectations**   | **What to Look For**  | **Little Books /Activity**  |
|  |  | Namir's Marvellous Masterpieces- investigate growing and shrinking patterns (further developed)- use equations to represent simple growing and shrinking patterns |
|  |  | Chance- explore the likelihood of different outcomes- investigate the fairness of games |

|  |  |  |
| --- | --- | --- |
| **Questions and Expectations**  | **What to Look For** | **Little Books /Activity** |
| **Predicting the likelihood of an event**D2.1 use mathematical language, including the terms “impossible”, “unlikely”, “equally likely”, “likely”, and “certain”, to describe the likelihood of events happening, and use that likelihood to make predictions and informed decisions | * *Do students connect the fairness of a game to equally likely outcomes?*
* *Can students use mathematical language (e.g., equally likely) to explain why the game is unfair?*
 | Data Management and Probability Unit 2: Probability and Chance8: Who’s Likely to Win?***9: Consolidation (Probability and Chance)*** |
| ***Reflection: How can we create patterns and predict the likelihood of events?*** |
| **Questions and Expectations** | **What to Look For** | **Little Books / Activity** |

|  |  |
| --- | --- |
| **Ontario Ministry Long Range Plan** | **Pearson *Mathology*** |
| **Mathematical Modelling** | **Big Ideas**This is an opportunity to apply mathematical concepts and skills from this grade to solve real-life problems that require the process of mathematical modelling using a variety of Big Ideas. |
| **Time:** 15 days |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
|  |  |  |
|  |  | The Street Party - add/subtract to 1000 - compare/order numbers to 1000 (further developed)  |
|  |  | A Week of Challenges- use properties of equality to solve problems- use the language of algebra |

|  |  |  |
| --- | --- | --- |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
| **Questions and Expectations** | **What to Look For** | **Little Books / Activity** |

|  |  |  |
| --- | --- | --- |
| **Questions and Expectations** | **What to Look For** | **Little Books /Activity** |
|  |  | Patterning and Algebra Unit 1: Patterns and Expressions 2: Representing Patterns3: Creating Patterns Data Management and Probability Unit 1: Data Management 4: Drawing Graphs***6: Consolidation (Data Management)*** Data Management and Probability Unit 2: Probability and Chance7: Making Predictions Geometry Unit 2: 3-D Solids7: Building Solids Geometry Unit 3: Mapping and Coding16: Altering Code |
| ***Reflection: How can we apply mathematical concepts and skills to solve real-life problems.*** |