Math Travels, volume 1

Curriculum Correlation: Ontario 1-9 Mathematics

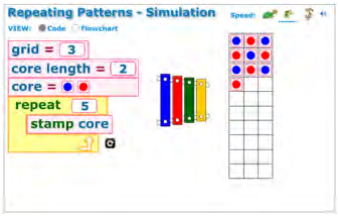
1. Patterns sing & dance (K-6)

Grade 1- ALGEBRA

C1.1 identify and describe the regularities in a variety of patterns, including patterns found in real-life contexts
C1.2 create and translate patterns using movements, sounds, objects, shapes, letters, and numbers
C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in patterns
C3.2 read and alter existing code, including code that involves sequential events, and describe how changes to the code affect the outcomes

Grade 2- ALGEBRA

C1.1 identify and describe a variety of patterns involving geometric designs, including patterns found in real-life contexts
C1.2 create and translate patterns using various representations, including shapes and numbers
C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements
C3.2 read and alter existing code, including code that involves sequential and concurrent events, and describe how changes to the code affect the outcomes in patterns represented with shapes and numbers

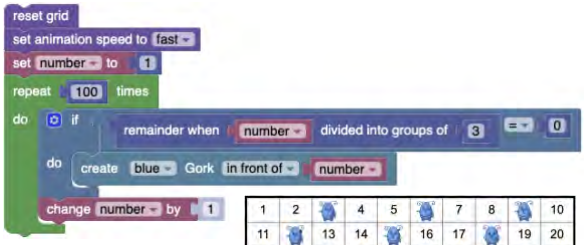


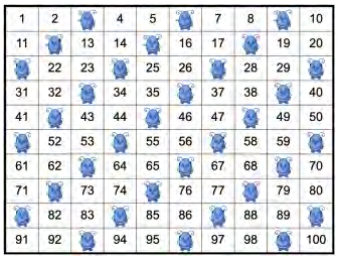
Grade 3- NUMBER

B2.2 recall and demonstrate multiplication facts for 1 × 1 to 10 × 10, and related division facts

Grade 3- ALGEBRA

C1.1 identify and describe repeating elements and operations in a variety of patterns, including patterns found in real-life contexts
C1.2 create and translate patterns that have repeating elements, movements, or operations using various representations, including shapes, numbers, and tables of values
C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in patterns that have repeating elements, movements, or operations
C3.2 read and alter existing code, including code that involves sequential, concurrent, and repeating events, and describe how changes to the code affect the outcomes





1	2		4	5		7	8		10
11		13	14		16	17		19	20
	22	23		25	26		28	29	
31	32		34	35		37	38		40
41		43	44		46	47		49	50
	52	53		55	56		58	59	
61	62		64	65		67	68		70
71		73	74		76	77		79	80
	82	83		85	86		88	89	
91	92		94	95		97	98		100

Grade 4- NUMBER

B2.2 recall and demonstrate multiplication facts for 1 × 1 to 10 × 10, and related division facts

Grade 4- ALGEBRA

C1.1 identify and describe repeating and growing patterns, including patterns found in real-life contexts
C1.2 create and translate repeating and growing patterns using various representations, including tables of values and graphs

C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating and growing patterns
C3.2 read and alter existing code, including code that involves sequential, concurrent, repeating, and nested events, and describe how changes to the code affect the outcomes

Grade 5- NUMBER
B2.2 recall and demonstrate multiplication facts from 0 × 0 to 12 × 12, and related division facts
Grade 5- ALGEBRA
C1.1 identify and describe repeating, growing, and shrinking patterns, including patterns found in real-life contexts
C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating, growing, and shrinking patterns
C3.2 read and alter existing code, including code that involves conditional statements and other control structures, and describe how changes to the code affect the outcomes

Grade 6- NUMBER
B2.2 understand the divisibility rules and use them to determine whether numbers are divisible by 2, 3, 4, 5, 6, 8, 9, and 10
Grade 6- ALGEBRA
C1.1 identify and describe repeating, growing, and shrinking patterns, including patterns found in real-life contexts, and specify which growing patterns are linear
C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating, growing, and shrinking patterns,
C3.2 read and alter existing code, including code that involves conditional statements and other control structures, and describe how changes to the code affect the outcomes and the efficiency of the code

2. Patterns climb staircases (1-9)

Grade 1 - NUMBER

B2.2 recall and demonstrate addition facts for numbers up to 10, and related subtraction facts

B2.3 use mental math strategies, including estimation, to add and subtract whole numbers that add up to no more than 20, and explain the strategies used

Grade 1 - ALGEBRA

C1.1 identify and describe the regularities in a variety of patterns, including patterns found in real-life contexts

C1.2 create and translate patterns using movements, sounds, objects, shapes, letters, and numbers

C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in patterns

C1.4 create and describe patterns to illustrate relationships among whole numbers up to 50

C2.1 identify quantities that can change and quantities that always remain the same in real-life contexts

C3.2 read and alter existing code, including code that involves sequential events, and describe how changes to the code affect the outcomes

Stage #	# of blocks
1	3 blue + 3 red = 6
2	6 blue + 3 red = 9
3	9 blue + 3 red = 12
4	12 blue + 3 red = 15
5	15 blue + 3 red = 18
10	30 blue + 3 red = 33
100	300 blue + 3 red = 103

Grade 2 - NUMBER

B2.2 recall and demonstrate addition facts for numbers up to 20, and related subtraction facts

B2.3 use mental math strategies, including estimation, to add and subtract whole numbers that add up to no more than 50, and explain the strategies used

Grade 2 - ALGEBRA

C1.1 identify and describe a variety of patterns involving geometric designs, including patterns found in real-life contexts

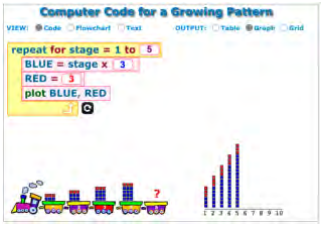
C1.2 create and translate patterns using various representations, including shapes and numbers

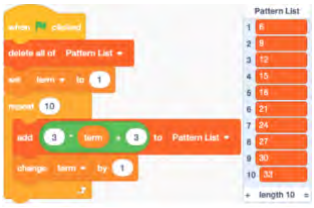
C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements

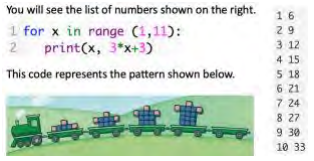
C1.4 create and describe patterns to illustrate relationships among whole numbers up to 100

C2.1 identify when symbols are being used as variables, and describe how they are being used

C3.2 read and alter existing code, including code that involves sequential and concurrent events, and describe how changes to the code affect the outcomes in patterns represented with shapes and numbers







Grade 3 - NUMBER

B2.2 recall and demonstrate multiplication facts of 2, 5, and 10, and related division facts

B2.3 use mental math strategies, including estimation, to add and subtract whole numbers that add up to no more than 1000, and explain the strategies used

Grade 3 - ALGEBRA

C1.1 identify and describe repeating elements and operations in a variety of patterns, including patterns found in real-life contexts

C1.2 create and translate patterns that have repeating elements, movements, or operations using various representations, including shapes, numbers, and tables of values

C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in patterns that have repeating elements, movements, or operations
C1.4 create and describe patterns to illustrate relationships among whole numbers up to 1000
C2.1 describe how variables are used, and use them in various contexts as appropriate
C3.2 read and alter existing code, including code that involves sequential, concurrent, and repeating events, and describe how changes to the code affect the outcomes

Grade 4 - NUMBER
B2.2 recall and demonstrate multiplication facts for 1 × 1 to 10 × 10, and related division facts
B2.3 use mental math strategies to multiply whole numbers by 10, 100, and 1000, divide whole numbers by 10, and add and subtract decimal tenths, and explain the strategies used

Grade 4 - ALGEBRA
C1.1 identify and describe repeating and growing patterns, including patterns found in real-life contexts
C1.2 create and translate repeating and growing patterns using various representations, including tables of values and graphs
C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating and growing patterns
C2.1 translate among words, algebraic expressions, and visual representations that describe equivalent relationships
C3.2 read and alter existing code, including code that involves sequential, concurrent, repeating, and nested events, and describe how changes to the code affect the outcomes

Grade 5 - ALGEBRA
C1.1 identify and describe repeating, growing, and shrinking patterns, including patterns found in real-life contexts
C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating, growing, and shrinking patterns
C2.2 evaluate algebraic expressions that involve whole numbers
C3.2 read and alter existing code, including code that involves conditional statements and other control structures, and describe how changes to the code affect the outcomes

Grade 6 - ALGEBRA
C1.1 identify and describe repeating, growing, and shrinking patterns, including patterns found in real-life contexts, and specify which growing patterns are linear
C1.2 create and translate repeating, growing, and shrinking patterns using various representations, including tables of values, graphs, and, for linear growing patterns, algebraic expressions and equations
C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating, growing, and shrinking patterns,
C2.2 evaluate algebraic expressions that involve whole numbers and decimal tenths
C3.2 read and alter existing code, including code that involves conditional statements and other control structures, and describe how changes to the code affect the outcomes and the efficiency of the code

Grade 7 - ALGEBRA
C1.1 identify and compare a variety of repeating, growing, and shrinking patterns, including patterns found in real-life contexts, and compare linear growing patterns on the basis of their constant rates and initial values
C1.2 create and translate repeating, growing, and shrinking patterns involving whole numbers and decimal numbers using various representations, including algebraic expressions and equations for linear growing patterns
C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating, growing, and shrinking patterns involving whole numbers and decimal numbers, and use algebraic representations of the pattern rules to solve for unknown values in linear growing patterns
C1.4 create and describe patterns to illustrate relationships among integers
C2.2 evaluate algebraic expressions that involve whole numbers and decimal numbers
C3.2 read and alter existing code, including code that involves events influenced by a defined count and/or sub-program and other control structures, and describe how changes to the code affect the outcomes and the efficiency of the code

Grade 8 - ALGEBRA

C1.1 identify and compare a variety of repeating, growing, and shrinking patterns, including patterns found in real-life contexts, and compare linear growing and shrinking patterns on the basis of their constant rates and initial values

C1.2 create and translate repeating, growing, and shrinking patterns involving rational numbers using various representations, including algebraic expressions and equations for linear growing and shrinking patterns

C3.2 read and alter existing code involving the analysis of data in order to inform and communicate decisions, and describe how changes to the code affect the outcomes and the efficiency of the code

Grade 9 - ALGEBRA

C1.2 create algebraic expressions to generalize relationships expressed in words, numbers, and visual representations, in various contexts

C1.3 compare algebraic expressions using concrete, numerical, graphical, and algebraic methods to identify those that are equivalent, and justify their choices

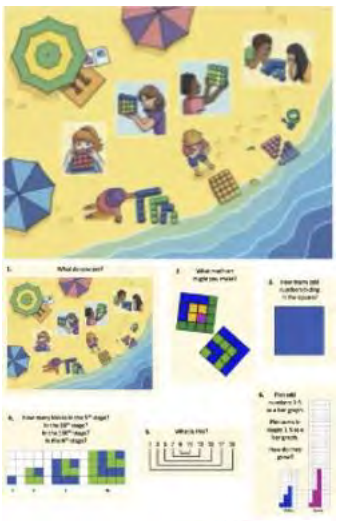
C1.4 simplify algebraic expressions by applying properties of operations of numbers, using various representations and tools, in different contexts

C1.5 create and solve equations for various contexts, and verify their solutions

C2. apply coding skills to represent mathematical concepts and relationships dynamically, and to solve problems, in algebra and across the other strands

C4. demonstrate an understanding of the characteristics of various representations of linear and non-linear relations, using tools, including coding when appropriate

3. Where number hide (1-8)



Grade 1- NUMBER

B1.3 compare and order whole numbers up to and including 50, in various contexts

B1.5 count to 50 by 1s, 2s, 5s, and 10s, using a variety of tools and strategies

B2.2 recall and demonstrate addition facts for numbers up to 10, and related subtraction facts

B2.3 use mental math strategies, including estimation, to add and subtract whole numbers that add up to no more than 20, and explain the strategies used

Grade 1- ALGEBRA

C1.1 identify and describe the regularities in a variety of patterns, including patterns found in real-life contexts

C1.4 create and describe patterns to illustrate relationships among whole numbers up to 50

C2.3 identify and use equivalent relationships for whole numbers up to 50, in various contexts

C3.2 read and alter existing code, including code that involves sequential events, and describe how changes to the code affect the outcomes

4x5 or N(N+1) *(4x5)/2 or N(N+1)/2*

Grade 2- NUMBER

B1.3 compare and order whole numbers up to and including 200, in various contexts

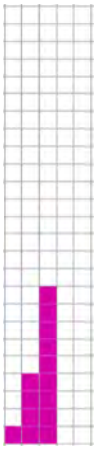
B1.4 count to 200, including by 20s, 25s, and 50s, using a variety of tools and strategies

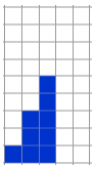
B2.2 recall and demonstrate addition facts for numbers up to 20, and related subtraction facts

B2.3 use mental math strategies, including estimation, to add and subtract whole numbers that add up to no more than 50, and explain the strategies used

B2.5 represent multiplication as repeated equal groups, including groups of one half and one fourth, and solve related problems, using various tools and drawings

(4x5)/2 or N(N+1)/2





Odds Sums

Grade 2- ALGEBRA

C1.1 identify and describe a variety of patterns involving geometric designs, including patterns found in real-life contexts

C1.4 create and describe patterns to illustrate relationships among whole numbers up to 100

C2.3 identify and use equivalent relationships for whole numbers up to 100, in various contexts

C3.2 read and alter existing code, including code that involves sequential and concurrent events, and describe how changes to the code affect the outcomes

Grade 3- NUMBER

B1.3 compare and order whole numbers up to and including 1000, in various contexts

B1.4 count to 1000, including by 50s, 100s, and 200s, using a variety of tools and strategies

B2.2 recall and demonstrate multiplication facts of 2, 5, and 10, and related division facts

B2.4 demonstrate an understanding of algorithms for adding and subtracting whole numbers by making connections to and describing the way other tools and strategies are used to add and subtract

Grade 3- ALGEBRA

C1.1 identify and describe repeating elements and operations in a variety of patterns, including patterns found in real-life contexts

```
1 for N in range (1,6):
2     print (2*N)
```

```
2
4
6
8
10
```

C1.4 create and describe patterns to illustrate relationships among whole numbers up to 1000
C2.3 identify and use equivalent relationships for whole numbers up to 1000, in various contexts
C3.2 read and alter existing code, including code that involves sequential, concurrent, and repeating events, and describe how changes to the code affect the outcomes

Grade 4- NUMBER

B1.2 compare and order whole numbers up to and including 10 000, in various contexts
B2.1 use the properties of operations, and the relationships between addition, subtraction, multiplication, and division, to solve problems involving whole numbers,
B2.2 recall and demonstrate multiplication facts for 1 × 1 to 10 × 10, and related division facts
B2.4 represent and solve problems involving the addition and subtraction of whole numbers that add up to no more than 10 000 and of decimal tenths, using appropriate tools and strategies, including algorithms
B2.5 represent and solve problems involving the multiplication of two- or three-digit whole numbers by one-digit whole numbers and by 10, 100, and 1000, using appropriate tools, including arrays

Grade 4- ALGEBRA

C1.1 identify and describe repeating and growing patterns, including patterns found in real-life contexts
C1.2 create and translate repeating and growing patterns using various representations, including tables of values and graphs
C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating and growing patterns
C2.1 identify and use symbols as variables in expressions and equations
C3.2 read and alter existing code, including code that involves sequential, concurrent, repeating, and nested events, and describe how changes to the code affect the outcomes

Grade 5- NUMBER

B1.2 compare and order whole numbers up to and including 100 000, in various contexts
B2.1 use the properties of operations, and the relationships between operations, to solve problems involving whole numbers
B2.2 recall and demonstrate multiplication facts from 0 × 0 to 12 × 12, and related division facts
B2.3 use mental math strategies to multiply whole numbers by 10, 100, and 1000, divide whole numbers by 10,
B2.4 represent and solve problems involving the addition and subtraction of whole numbers that add up to no more than 100 000, and of decimal numbers up to hundredths, using appropriate tools, strategies, and algorithms
B2.6 represent and solve problems involving the multiplication of two-digit whole numbers by two-digit whole numbers using the area model and using algorithms, and make connections between the two methods

Grade 5- ALGEBRA

C1.1 identify and describe repeating, growing, and shrinking patterns, including patterns found in real-life contexts
C1.2 create and translate growing and shrinking patterns using various representations, including tables of values and graphs
C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating, growing, and shrinking patterns
C2.1 translate among words, algebraic expressions, and visual representations that describe equivalent relationships
C2.2 evaluate algebraic expressions that involve whole numbers
C3.2 read and alter existing code, including code that involves conditional statements and other control structures, and describe how changes to the code affect the outcomes

Grade 6- NUMBER

B1.3 compare and order whole numbers up to and including 50, in various contexts
B2.2 understand the divisibility rules and use them to determine whether numbers are divisible by 2, 3, 4, 5, 6, 8, 9, and 10

Grade 6- ALGEBRA

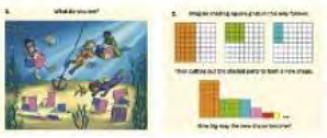
C1.1 identify and describe repeating, growing, and shrinking patterns, including patterns found in real-life contexts, and specify which growing patterns are linear

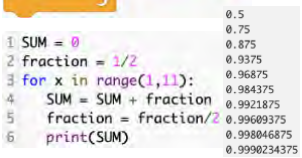
C1.2 create and translate repeating, growing, and shrinking patterns using various representations, including tables of values, graphs, and, for linear growing patterns, algebraic expressions and equations
C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating, growing, and shrinking patterns, and use algebraic representations of the pattern rules to solve for unknown values in linear growing patterns
C3.2 read and alter existing code, including code that involves conditional statements and other control structures, and describe how changes to the code affect the outcomes and the efficiency of the code

Grade 7- NUMBER
B1.3 compare and order whole numbers up to and including 50, in various contexts
Grade 7- ALGEBRA
C1.1 identify and compare a variety of repeating, growing, and shrinking patterns, including patterns found in real-life contexts, and compare linear growing patterns on the basis of their constant rates and initial values
C1.2 create and translate repeating, growing, and shrinking patterns involving whole numbers and decimal numbers using various representations, including algebraic expressions and equations for linear growing patterns
C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating, growing, and shrinking patterns involving whole numbers and decimal numbers, and use algebraic representations of the pattern rules to solve for unknown values in linear growing patterns
C3.2 read and alter existing code, including code that involves events influenced by a defined count and/or sub-program and other control structures, and describe how changes to the code affect the outcomes and the efficiency of the code

Grade 8- NUMBER
B1.3 compare and order whole numbers up to and including 50, in various contexts
Grade 8- ALGEBRA
C1.1 identify and compare a variety of repeating, growing, and shrinking patterns, including patterns found in real-life contexts, and compare linear growing and shrinking patterns on the basis of their constant rates and initial values
C1.2 create and translate repeating, growing, and shrinking patterns involving rational numbers using various representations, including algebraic expressions and equations for linear growing and shrinking patterns
C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in growing and shrinking patterns involving rational numbers, and use algebraic representations of the pattern rules to solve for unknown values in linear growing and shrinking patterns
C3.2 read and alter existing code involving the analysis of data in order to inform and communicate decisions, and describe how changes to the code affect the outcomes and the efficiency of the code

4. Infinity in your hand (2-9)





Grade 2 - NUMBER

B1.6 use drawings to represent, solve, and compare the results of fair-share problems that involve sharing up to 10 items among 2, 3, 4, and 6 sharers, including problems that result in whole numbers, mixed numbers, and fractional amounts

B1.7 recognize that one third and two sixths of the same whole are equal, in fair-sharing contexts

Grade 2 - ALGEBRA

C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in patterns represented with shapes and numbers

C3.2 read and alter existing code, including code that involves sequential and concurrent events, and describe how changes to the code affect the outcomes

Grade 3 - NUMBER

B1.6 use drawings to represent, solve, and compare the results of fair-share problems that involve sharing up to 20 items among 2, 3, 4, 5, 6, 8, and 10 sharers, including problems that result in whole numbers, mixed numbers, and fractional amounts

B1.7 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

B2.8 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 notation

Grade 3 - ALGEBRA

C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in patterns that have repeating elements, movements, or operations

C3.2 read and alter existing code, including code that involves sequential, concurrent, and repeating events, and describe how changes to the code affect the outcomes

Grade 4 - NUMBER

B1.4 represent fractions from halves to tenths using drawings, tools, and standard fractional notation, and explain the meanings of the denominator and the numerator

B1.5 use drawings and models to represent, compare, and order fractions representing the individual portions that result from two different fair-share scenarios involving any combination of 2, 3, 4, 5, 6, 8, and 10 sharers

B1.6 count to 10 by halves, thirds, fourths, fifths, sixths, eighths, and tenths, with and without the use of tools

B2.7 represent the relationship between the repeated addition of a unit fraction and the multiplication of that unit fraction by a whole number, using tools, drawings, and standard fractional notation

Grade 4 - ALGEBRA

C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating and growing patterns

C3.2 read and alter existing code, including code that involves sequential, concurrent, repeating, and nested events, and describe how changes to the code affect the outcomes

Grade 5 - NUMBER

B1.3 represent equivalent fractions from halves to twelfths, including improper fractions and mixed numbers, using appropriate tools, in various contexts

B1.4 compare and order fractions from halves to twelfths,

B1.7 describe relationships and show equivalences among fractions, decimal numbers up to hundredths, and whole number percents, using appropriate tools and drawings, in various contexts
B2.5 add and subtract fractions with like denominators, in various contexts
B2.8 multiply and divide one-digit whole numbers by unit fractions, using appropriate tools and drawings

Grade 5 - ALGEBRA

C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating, growing, and shrinking patterns
C3.2 read and alter existing code, including code that involves conditional statements and other control structures, and describe how changes to the code affect the outcomes

Grade 6 - NUMBER

B1.6 describe relationships and show equivalences among fractions and decimal numbers up to thousandths, using appropriate tools and drawings, in various contexts
B2.5 add and subtract fractions with like and unlike denominators, using appropriate tools, in various contexts
B2.9 multiply whole numbers by proper fractions, using appropriate tools and strategies

Grade 6 - ALGEBRA

C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating, growing, and shrinking patterns, and use algebraic representations of the pattern rules to solve for unknown values in linear growing patterns
C3.2 read and alter existing code, including code that involves conditional statements and other control structures, and describe how changes to the code affect the outcomes and the efficiency of the code

Grade 7 - NUMBER

B1.4 use equivalent fractions to simplify fractions, when appropriate, in various contexts
B1.7 convert between fractions, decimal numbers,
B2.5 add and subtract fractions, including by creating equivalent fractions, in various contexts
B2.8 multiply and divide fractions by fractions, using tools in various contexts

Grade 7- ALGEBRA

C3.2 read and alter existing code, including code that involves events influenced by a defined count and/or sub-program and other control structures, and describe how changes to the code affect the outcomes and the efficiency of the code

Grade 8 - NUMBER

B2.5 add and subtract fractions, using appropriate strategies, in various contexts
B2.6 multiply and divide fractions by fractions, as well as by whole numbers and mixed numbers, in various contexts

Grade 8 - ALGEBRA

C1.4 create and describe patterns to illustrate relationships among rational numbers
C3.2 read and alter existing code involving the analysis of data in order to inform and communicate decisions, and describe how changes to the code affect the outcomes and the efficiency of the code

Grade 9 - NUMBER

B1.1 research a number concept to tell a story about its development and use in a specific culture, and describe its relevance in a current context
B1.2 describe how various subsets of a number system are defined, and describe similarities and differences between these subsets
B1.3 use patterns and number relationships to explain density, infinity, and limit as they relate to number sets
B3.2 apply an understanding of unit fractions and their relationship to other fractional amounts, in various contexts, including the use of measuring tools

Grade 9 - ALGEBRA

C2. apply coding skills to represent mathematical concepts and relationships dynamically, and to solve problems, in algebra and across the other strands
C2.3 read code to predict its outcome, and alter code to adjust constraints, parameters, and outcomes to represent a similar or new mathematical situation

C3.1 compare the shapes of graphs of linear and non-linear relations to describe their rates of change, to make connections to growing and shrinking patterns, and to make predictions
C4.1 compare characteristics of graphs, tables of values, and equations of linear and non-linear relations