**Possible Big Idea Sets to Base Instruction On**

(Big Ideas taken from Marian Small’s, Big Ideas from Dr. Small K-3)

|  |  |  |
| --- | --- | --- |
| **Big Ideas:****NS&N*** A number tells how many are in a group. You usually count to determine the size of a group.

**Geo&SS*** Some attributes of shapes are quantitative, others are qualitative (e.g., the fact that a circle is round is qualitative; the fact that a triangle has three vertices is quantitative)

**Measurement*** The use of standard measurement units simplifies communication about the size of objects.

**Curriculum Expectations:*** Demonstrate using concrete materials, the concept of conservation of number (e.g., 5 counters represent the number 5, regardless whether they are close together or far apart)
* Identify and describe common two-dimensional shapes (e.g., circles, triangles, rectangles, squares) and sort and classify them by their attributes (e.g., colour, size, texture, number of sides), using concrete materials and pictorial representations
* Identify common two-dimensional shapes and three-dimensional figures and sort and classify them by their attributes
 | **Big Ideas:****NS&N*** You can represent a number in a variety of ways. Each representation of a number can focus on a different aspect of the number.
* To compare and order numbers, we can compare them to more familiar benchmark numbers.

**Patterning*** The mathematical structure of a pattern can be represented in a variety of ways.

**Measurement*** Familiarity with known benchmark measurements can help you estimate and calculate other measurements.
* There is always value in estimating an amount (measurement), sometimes because an estimate is all you need or all that is possible, and sometimes because an estimate is a useful check on the reasonableness of an amount (measurement).
* Area tells how much material is required to cover a shape on the surface of an object. Shapes that look different can have the same area.

**Curriculum Expectations:*** Represent money amounts to 20 cents, through investigation using coin manipulatives
* Use ordinal numbers to thirty-first in meaningful contexts (e.g., identify the days of the month on a calendar)
* Relate temperature to experiences of the seasons
* Demonstrate examples of equality, through investigation, using a “balance” model
* Trace and identify two-dimensional faces of three-dimensional figures, using concrete models
* Represent, compare, and order whole numbers to 50, using a variety of tools
* Read and print in words whole numbers to ten, using meaningful contexts
* Identify and describe various coins using manipulatives or drawings, and state their value
* Estimate, measure, and describe area, through investigation using non-standard units
* Use the metre as a benchmark for measuring length, and compare the metre with non-standard units
* Compose and decompose common two-dimensional shapes and three-dimensional figures
 | **Big Ideas:****NS&N*** The place value system we use is built on patterns to make our work with numbers more efficient.
* Students gain a sense of the size of numbers by comparing them to meaningful benchmark numbers.

**Data Management*** When working with data, you usually organize or classify the data into meaningful categories.
* Concrete graphs, picture graphs, pictographs, tally charts, bar graphs, and line plots are useful for comparing the frequency of data in different categories.
* There are always many ways to sort of organize data.

**Curriculum Expectations:*** Relate numbers to the anchors of 5 and 10
 |

|  |  |  |
| --- | --- | --- |
| **Big Ideas:****NS&N*** A number tells how many are in a group. To count the number in a group, we often create subgroups and count the number of subgroups.
* Counting is fundamental to number. Forms of counting include rote counting, counting all, counting on, skip counting, and counting back.

**Patterning*** Some ways of displaying data highlight patterns.
* Patterns represent identified regularities. There is always an element of repetition, whether the same items repeat, or whether a ‘transformation,’ for example, adding 1, repeats.

**Measurement*** The unit chosen for a measurement affects the numerical value of the measurement; if you use a bigger unit, fewer units are required.
* The same object can be described using different measurements.
* Any measurement can be determined in more than one way.

**Curriculum Expectations:*** Count forwards by 1’s, 2’s, 5’s, and 10’s to 100, using a variety of tools and strategies
* Demonstrate, using concrete materials, the concept of one-to-one correspondence between number and objects when counting
* Demonstrate an understanding of the use of non-standard units of the same size
* Describe, through investigation using concrete materials, the relationship between the size of a unit and the number of units needed to measure length
* Estimate measure, and record lengths, heights, and distances
* Count backwards from 20 by 2’s and 5’s using a variety of tools
* Count backwards by 1’s from 20 and any number less than 20 with and without the use of concrete materials and number lines
* Estimate the number of objects in a set, and check by counting
* Describe numeric repeating patterns in a hundreds chart
* Identify a rule for a repeating pattern
* Identify and extend, through investigation numeric repeating patterns
* Create a repeating pattern involving one attribute
* Represent a given repeating pattern in a variety of ways
 | **Big Ideas:****NS&N*** There are a variety of appropriate ways to estimate sums and differences depending on the numbers involved and the context. Estimates are useful for both checking calculations and because sometimes an estimate is all that is needed.
* A personal ‘invented’ algorithm is often more meaningful and sometimes equally efficient as a conventional algorithm.
* There are many situations to which an operation is applied, and there are many procedures, or algorithms, for each operation.
* There are relationships between the four operations:

-you can represent subtraction as the opposite of addition or vice versa-you can represent multiplication as repeated addition and vice versa-you can represent division as repeated subtraction and vice versa-you can represent division as the opposite of multiplication and vice versa**Measurement*** We use units to make measurement comparisons simpler. This is only effective if the same unit is used for both objects and the unit is uniform.

**Curriculum Expectations:*** Create a set in which the number of objects is greater than, less than, or equal to the number of objects in a given set.
* Solve a variety of problems involving the addition and subtraction of whole numbers to 20, using concrete materials and drawings.
* Add and subtract money amounts to 10 cents, using coin manipulatives and drawings.
* Compare two or three objects using measurable attributes
* Determine, through investigation using a ‘balance’ model and whole numbers to 10, the number of identical objects that must be added or subtracted to establish equality
* Solve problems involving the addition and subtraction of single-digit whole numbers, using a variety of mental strategies
* Compare and order objects by their linear measurements, using the same non-standard unit
* Solve problems involving the addition and subtraction of single-digit whole numbers, using a variety of mental strategies
 | **Big Ideas:****NS&N*** You can describe the same portion using two or more different fractions, or using a fraction and a decimal.
* To compare the numbers of items in two sets, you can match the items, one to one, in the two sets to see whether one set has more. Or, you can compare the position of the numbers that describe the two quantities in the number sequence.

**Curriculum Expectations:*** Compose and decompose numbers up to 20 in a variety of ways, using concrete materials
 |

|  |  |  |
| --- | --- | --- |
| **Big Ideas:****NS&N*** A fraction is not meaningful without knowing what the whole is.
* You can use a fraction to describe any partitions of a whole. Decimals describe partitions of wholes to preserve the pattern of the place value system.
* There are always two fractions involved in any single fraction situation- the part you are considering and the rest of the whole.
* Fractions can represent parts of regions, parts of sets, or parts of measures. These meanings are equivalent.

**Measurement****Curriculum Expectations:*** Divide whole objects into parts and identify and describe, through investigation, equal-sized parts of the whole, using fractional names
 | **Big Ideas:****Geometry and Spatial Sense*** Locations can be described using positional language, maps and grids.
* Many of the properties and attributes that apply to 2-D shapes also apply to 3-D shapes.
* Many geometric properties and attributes of shapes are related to measurement.

**Measurement*** The length of an object is the number of units along a line or curve on an object. Length can be the measurement of a single measure of the object, such as the length of a rectangle, or a combined linear measure.

**Curriculum Expectations:*** Create symmetrical designs and pictures, using concrete materials.
* Construct, using a variety of strategies, tools for measuring lengths, heights, and distances in non-standard units.
* Construct, using a variety of strategies, tools for measuring length, heights, and distances in non-standard units
* Describe the relative locations of objects or people using positional language
* Describe the relative locations of objects on concrete maps, created in the classroom.
* Build three-dimensional structures using concrete materials, and describe the two-dimensional shapes the structures contain
* Describe similarities and differences between an everyday object and a three-dimensional figure
* Identify and describe common three-dimensional figures and sort and classify them by their attributes using concrete materials and pictorial representations
 | **Big Ideas:****Data Management and Probability*** Graphs are powerful data displays, since visual displays quickly reveal information about data.
* To collect good first-hand data, you must decide what collection method is most suitable and how best to pose any questions required to collect the data.

**Measurement*** The capacity of an object tells how much it will hold as a container. A big object can have a smaller capacity than a smaller object, depending in thickness of the walls or the dimensions of the containers.
* The mass of an object tells how heavy it is. A big object can have a smaller mass than a smaller object.
* Time is a measurement of how long something takes. Reading a clock, or telling time, is not a measurement unless you relate the time to another event.

**Curriculum Expectations:*** Estimate, measure, and describe the capacity and/or mass of an object, through investigation using non-standard units
* Estimate, measure, and describe the passage of time, through investigation using non-standard units
* Name the months of the year in order, and read the date on a calendar.
* Read demonstration digital and analogue clocks, and use them to identify benchmark times
* Collect and organize primary data …
 |
| **Big Ideas:****Data Management and Probability*** In a probability situation, you can never be sure what will happen next.
* Categorizing events using terms such as likely, certain, impossible, and unlikely is a way of describing probability
* It is important not only to read information from graphs but to make inferences, draw conclusions, and make predictions.
* In experimental situations, we base our predictions on past events.

**Curriculum Expectations*** Demonstrate an ability to organize objects into categories by sorting and classifying objects using one attribute and by describing informal sorting experiences
* Read primary data presented in bar graphs and pictographs, and describe the data using comparative language
* Pose and answer questions about collected data
* Describe the likelihood that everyday events will occur using mathematical language.
* Collect and organize primary data that is categorical and display the data using one-to-one correspondence, prepared templates of concrete graphs and pictographs and a variety of recording methods
 |  |  |