Shekou International School

Overview:

The goal of early years mathematics is to expose children to a wide variety of mathematical concepts, and to the language and representations associated with those concepts. Exposure to foundational mathematical ideas helps children to make sense of their world and to develop mathematical thinking and conceptual understanding.

Foundational mathematical skills develop naturally and concurrently with each child's social, emotional, physical and cognitive development. In the early years, mathematical concepts are explored primarily through authentic situations that occur as children play, inquire, and interact with each other and their environment. They can also be explored through stories, songs, movement, art and mini-lessons. ECC teachers encourage a language-rich environment by using guiding questions and discourse prompts to develop each child's language and understanding. Examples of discourse prompts include: "Why?" "What do you notice?" "Show me/Draw me a picture/Act it out." "Explain it to me." "How do know?"

All children are unique and learn in different ways and at different times. The enduring understandings, guiding questions, and foundational standards outlined in this document should be viewed as indicators of what a child may be developmentally ready for. Teachers and parents should view them as a continuum of understanding and draw from the column most appropriate for each individual child.

This ECC Foundational Mathematics Curriculum is informed by research and the following curriculum and frameworks:

- Te Whariki Curriculum (NZ)
- National Association for Education of Young Children (USA)
- New York and California State Pre-K Standards (USA)
- Early Years Mathematical Developmental Continuums (International)

Number Sense			
Te Whariki Strands	•Communication •Exploration		
Te Whariki Goals	•Experience with stories & symbols •Skills for a range of purposes		
Te Whariki Outcomes	•Familiarity with numbers and their uses •Skill in using counting system and numbers •Language skills for structured contexts •Using a variety of strategies for making sense of the world including: patterns, classifying, comparing		
	Nursery	**PreK1**	**PreK2**
Enduring Understanding	•Numbers are all around us •Numbers have names •We use numbers to count objects	•We use numbers to find out 'how many' objects are in a collection •Numbers can be represented in different ways (e.g. objects, fingers, numerals, pictures) •When we count collections we always say the numbers in the same order (stable order rule) •We 'touch' each object once and say one number name when we count a group of objects to find out 'how many' (1-to-1) •Numbers can be made in different ways	•Numbers help us make sense of things around us •We can read and write numbers •The last number name in counting tells us how many are in the collection (cardinal rule) •The number of objects remains the same no matter how the objects are arranged or the order in which they are counted •With a small collection of objects we may know 'how many' without counting (subitizing) •We can make a guess about 'how many' objects are in a collection (estimating) •Numbers can be made in different ways (composing and decomposing)

Guiding Questions	•Invitations to count: How many? Shall we count…?	•What is a number? Does it have a name? •Where do we find numbers? •What do numbers 'look' like? •What can we count?	•Do we always say the number names in the same order? •Why are numbers important? •When and how do we use numbers? •When do we need to count? •Can you guess how many? Which group has more? less? •How can we check if our guess is right? •Show me (number name)? •What number comes next?
Foundational Standards	Not developmentally appropriate	•1.N.1 Counts 0-10 by rote or in songs/ rhymes •1.N.2 Recognizes some written numerals •1.N.3 Counts up to 5 using 1:1 correspondence with increasing accuracy •1.N.4 Identifies without counting the number of objects in collections up to 3 (subitizing) •1.N.5 When counting, understands that the number name represents objects in a group ("how many?") •1.N.6 Can decompose numbers in different ways (e.g., I can make 4 with 2 and 2, or 3 and 1)	•2.N.1Counts 0-20 by rote •2.N.2 Recognizes and knows some written numerals between 1 and 10 •2.N.3 Counts up to 10 using 1:1 correspondence with increasing accuracy •2.N.4 Identifies without counting the number of objects in collections up to 5 (subitizing) •2.N.5 Makes increasingly accurate guesses about how many in a collection up to 10 (estimating) •2.N.6 Can decompose numbers in different ways (e.g., I can make 6 with 3 and 3, or 4 and 2)
Examples of Key Vocabulary	•One, two, three, four, five •How many? How much? More	•Number/s, one, two, three, four, five, six, seven, eight, nine, ten •Comparisons: more, same, different •Ordinal: First	•Number/s, zero, one, two, three, four, five, six, seven, eight, nine, ten •teen numbers (only when rote counting) •None, nothing, zero •Comparisons: more, less, same •Prepositions: next, before, after

Operations			
Te Whariki Strands	•Communication •Exploration		
Te Whariki Goals	•Experience with stories & symbols •Creativity & expression •Skills for a range of purposes		
Te Whariki Outcomes	•Familiarity with numbers and their uses •Skill in using counting system and numbers •Create and express through rhythm (e.g. chants, beat, dance, movement) •Language skills for structured contexts •Using a variety of strategies for making sense of the world including: patterns, classifying, comparing		
	Nursery	**PreK1**	**PreK2**
Enduring Understanding	•Groups of objects can differ in amount, size, etc.	•Some groups have more, some have less, some have the same number of objects •If we add more objects the group size will increase •If we take objects away the group size will decrease •We can put two groups together to make a larger group (joining, combining)	•We can use objects, fingers, drawings, sounds, movement and acting out to explore math problems •We can combine 2 or more groups to make a bigger group •We can take apart a group to make smaller groups •We can count to find out how many are in each group / to find out how many all together

Guiding Questions	•Which group is bigger? •Which group is smaller?	•What happens when we put 2 groups together? •What happens if we add more? take some away? •How do I make this group have more? have less? •Are the groups the same or different? why?	•Which group has more? less? •How can I change the amount of objects in this group of objects? •How do I make 2 groups the same? •How can we make more groups? •When do we need to add groups of objects together? •How many objects all together? are left? •When do you need to take objects away from a group? •How can we make a group of __ objects?
Foundational Standards	Not developmentally appropriate	•1.O.1 Compare groups visually and identify as more or same •1.O.2 Understand that adding to or taking away from a group will increase or decrease the number of objects •1.O.3 Understand that putting two groups of objects together will make a bigger group •1.O.4 Demonstrate understanding of the concepts of combining and separating up to 5 objects	•2.O.1 Compare groups of up to 5 objects and identify as more, same as, or fewer/ less •2.O. 2 Understand that adding one or taking away on changes the number in a small group of objects by exactly one •2.O.3 Understand that putting two groups of objects together will make a bigger group; Taking apart a group makes two smaller groups •2.O.4 Demonstrate understanding of the concepts of combining and separating up to 10 objects
Examples of Key Vocabulary	•bigger, smaller	•more, less •same, different •combining, joining	•same, equal •different, larger, smaller •add, take away •how many, all together, total, amount

Measurement & Data			
Te Whariki Strands	•Communication •Exploration		
Te Whariki Goals	•Experience with stories & symbols •Skills for a range of purposes •Strategies for active exploration •Developing working theories		
Te Whariki Outcomes	•Skills in using mathematical concepts such as length, weight, volume •Language skills for structured contexts •Using a variety of strategies for making sense of the world including: patterns, classifying, comparing •Spatial representations such as maps, diagrams, photos, drawings		
	Nursery	**PreK1**	**PreK2**
Enduring Understandings	•We can compare objects	•We can measure objects to see how long they are, how heavy they are, or how much they hold •We can use small objects or body parts to measure objects •We can make a guess/prediction	•We can compare and order objects •We can organize information (eg., charts, graphs) •We can survey people to get information •We can collect information from our environment

Guiding Questions	•Is this the same…? Different? (sorting) •Which object is….? (comparison)	•Which object is longer/taller/shorter/ heavier/lighter? •Can you make it longer or shorter? •How can we sort this collection into different groups? •What is the same about each group? What is different about each group?	•How are these objects the same? Different? •How can we measure how long an object is? How heavy an object is? •How do we know which object is longer? heavier? •How do we put these objects in order? •How do we get information about something? •How can we organize this information?
Foundational Standards	Not developmentally appropriate	•1.M.1 Demonstrate awareness that objects can be compared by length, weight, or capacity •1.M.2 Order three or more objects by size	•2.M.1 Compare two objects by length, weight, or capacity •2.M.2 Order four or more objects by size
Examples of Key Vocabulary	•Same, different •long, short •heavy, light	•measure •little, small, big, same, different, more, less •Length terms: long, short, longer, shorter, tall, taller •Weight terms: heavy, light •Volume terms: empty, full, more, less	•same, different, equal, more, less, •measure, little, small, medium, big, half •Length terms: long, longer, longest, short, shorter, shortest, tall, taller, tallest •Weight terms: heavy, heavier, light, lighter •Volume terms: empty, full, more, less

Geometry			
Te Whariki Strands	•Communication •Exploration		
Te Whariki Goals	•Experience with stories & symbols •Skills for a range of purposes •Strategies for active exploration •Develop working theories		
Te Whariki Outcomes	•Skills in using mathematical concepts such as shape and pattern •Language skills for structured contexts •Using a variety of strategies for making sense of the world including: patterns, classifying, comparing •Spatial understanding, including 2D & 3D objects		
	Nursery	**PreK1**	**PreK2**
Enduring Understanding	•Shapes are all around us •Shapes have names	•We can find shapes all around us •Shapes come in different sizes •We can draw shapes •A circle is round •A square has straight sides	•Our environment is filled with shapes •There are flat (2D) and solid (3D) shapes •A circle has a round/curved side •Squares, triangles and rectangles have straight sides •We can count corners and sides •Shapes keep the same name even if they are different sizes •Shapes can be formed from different materials •We can combine shapes to make pictures •We can create shape patterns •We can use words to describe a shape or position

Guiding Questions	•What shape is this? •Can you make a…..?	•Where do we find shapes? •What do you notice about this shape? •What is a circle? square? triangle? •How can we sort these shapes into different groups? •What is the same about these shapes? •What is different about these shapes?	•What shapes are in our classroom? playground? home? •How can you sort/group this collection of shapes? Why did you do it that way? •What is a circle? square? triangle? rectangle? Is this still… (make big/ small) •Are all these __? How do you know? •Can you make a circle? square? triangle? rectangle? •How do you know this shape is a __? •How are these shapes the same? alike? different? •Do some shapes fit inside other shapes? •Can you make a __? •What can you make with these shapes? •What shapes can you see in this picture/object/photo?
Foundational Standards	Not developmentally appropriate	•1.G.1 Identify simple 2D shapes including circle and square •1.G.2 Use individual shapes to represent different elements of a picture or design	•2.G.1 Identify, describe and construct a variety of different shapes including: circle, triangle, rectangle, and square. •2.G.2 Combine different shapes to create a picture design
Examples of Key Vocabulary	•shape, circle, square, triangle	•shape, circle, square, triangle •round, straight, same, different	•shape, circle, square, triangle, rectangle, • sides, corners, same, different, curved, straight, round, longer, shorter, same, alike, different •Positional language - next to, above, below, inside, outside, under, over