Conceptual Curriculum Map (CCM) for Grade 1

Content Area: Mathematics   **Course: Bridges in Mathematics**   **Grade Level: Grade 1**

Math Transfer Goals:

TG1: Analyze and model mathematical relationships in authentic and varied contexts, make informed decisions, and draw conclusions.

TG2: Persevere, think strategically/flexibly, and reflect and revise thinking in order to solve complex problems.

TG3: Construct viable arguments, critique the reasoning of others, and communicate ideas precisely using the language of mathematics

TG4: Share diverse ideas and perspectives, ask questions, and respectfully engage with peers while working towards a common goal.

Global Competency Transfer Goals (CT: Critical Thinking; CO: Collaboration; CI: Creativity & Innovation):

CT.1: Students will be able to analyze and evaluate evidence, arguments, claims and beliefs to draw conclusions, make informed decisions, and solve problems.

CT.2: Students will be able to reflect on their own thinking when presented with alternative points of view, and revise and/or reconsider their thinking.

CO: Students will be able to respectfully engage with others in constructive and critical dialogue, and take the initiative needed to accomplish a shared goal.

CI: Students will be able to exhibit curiosity, imagination, flexibility, and perseverance in order to innovate and make valuable contributions to the community.

Math Learning Progressions *(not yet updated w/ MLC unit references)*

Unit 1 Numbers all Around Us	Long-Term Outcomes/Transfer Goals: ● **TG1:** Analyze and model mathematical relationships in authentic and varied contexts, make informed decisions, and draw conclusions ● **CT2:** Students will be able to reflect on their own thinking when presented with alternative points of view, and revise and/or reconsider their thinking		
	Standards Assessed	**Conceptual Overview**	**Rationale**
Focus & Timeframe Development of	**1.OA.5** (D)- Relate counting to addition and subtraction	Establish classroom standards around exploring and communicating about	Children need a strong number foundation to develop the intuitions and

| number sense and number combinations

(20 days) | **1.OA.6** (I)- Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten; decomposing a number leading to a ten, using the relationship between addition and subtraction; and creating equivalent but easier or known sums

1.NBT.1 (I)- Count to 120, starting with any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral | numbers.

The mathematical focus is the development of number sense and number combinations (with emphasis on combinations to 10).

Students will use the concept of subitizing to see numbers inside of larger numbers

The unit introduces important mathematical models, including the number rack and five- and ten-frames, and students are expected to become proficient using strategies that emerge from these models.

Students work with nonstandard units to measure various distances and lengths. | skills required for operational fluency

Subitizing allows students to use creative and informal strategies for addition and subtraction and is central to a well rounded sense of numbers.

A student with part-part-whole understanding can see the part distinct from the whole, and at the same time, not lose sight of the whole as it relates to its component parts

These models help students develop a nuanced understanding of how 5 and 10 are unique mathematical structures

Length activities with nonstandard units are useful for the continued development of number sense. They also introduce the measurement concepts that will be developed throughout the Bridges program. |

Unit 2 **Developing Strategies with Dice & Dominoes**	**Long-Term Outcomes/Transfer Goals:**		
	● **TG1:** Analyze and model mathematical relationships in authentic and varied contexts, make informed decisions, and draw conclusions. ● **CT.2:** Students will be able to reflect on their own thinking when presented with alternative points of view, and revise and/or reconsider their thinking.		
	Standards Assessed	**Conceptual Overview**	**Rationale**
Focus & Timeframe Developing strategies for adding and	**1.OA.3** - (I) Apply the commutative property of addition to add	The goal of this unit is to help students reason mathematically, leaving behind a "calculation by	The ability to subitize is fundamental to this notion of the structure of numbers

subtracting single-digit numbers within 10 (20 days)	**1.OA.4** (D) - Solve subtraction problems by finding an unknown addend **1.OA.5** (D) - Solve addition problems by counting on **1.OA.6** (I) - Add fluently with sums to 10 **1.OA.8** (I) - Solve for the unknown in an addition or subtraction equation involving 3 whole numbers **1.NBT.3** (D) - Use >, =, and < symbols to record comparisons of two 2-digit numbers	counting" mentality for a more nuanced, structured approach to addition and subtraction. It asks students to identify, select, and implement efficient strategies that resonate with their intuitions about mathematics and, in this case more specifically, number combinations. This unit helps children develop confidence with efficient, effective, and sensible strategies for adding and subtracting single-digit numbers. Students explore such strategies as counting on, combining small groups of numbers within larger numbers, building from known facts, using doubles facts to solve other addition problems, counting by 5s and 10s, and using the commutative property. Students are encouraged to view the equal sign as a way to indicate that two expressions are of equal value, not as a symbol that precedes "the answer." Develop strategies for adding and subtracting single-digit numbers in ways that are connected to their natural reasoning.	Once students understand this, they can begin to reason algebraically as they find unknown values that make a given equality statement true The relational view of equality is perhaps the most important algebraic concept to be learned in the early grades, making it possible for young children to solve for unknown values in an equation. Addition is often thought of as either increasing a given amount (adding some number to an existing quantity), or as the joining of two distinct sets. In contrast, subtraction is often thought of as "taking away" or, perhaps more subtly, the "difference" between two sets. Understanding the relationship between addition and subtraction is foundational to developing strategies for adding and subtracting single-digit numbers in ways that are connected to students' natural reasoning.
Unit 3 **Adding, Subtracting, Counting & Comparing**	**Long-Term Outcomes/Transfer Goals:** ● **TG1:** Analyze and model mathematical relationships in authentic and varied contexts, make informed decisions, and draw conclusions.		

	CT.1: Students will be able to analyze and evaluate evidence, arguments, claims and beliefs to draw conclusions, make informed decisions, and solve problems.		
	Standards Assessed	**Conceptual Overview**	**Rationale**
Focus & Timeframe Developing strategies for adding, subtracting, and comparing quantities up to 20 (20 days)	**1.OA.1** (D) - Solve addition and subtraction story problems with sums and minuends to 20 involving situations of adding to, putting together, taking away, and comparing, with unknowns in all positions **1.OA.4** (D) - Solve subtraction problems by finding an unknown addend **1.OA.6** (D) - Add and subtract fluently within 10 **1.OA.8** (D) - Solve for the unknown in an addition equation involving 3 whole numbers **1.NBT.1** (D) - Represent a number of objects with a written numeral up to 120 **1.NBT.2** (D) - Demonstrate an understanding that the digits in a 2-digit number represent amounts of tens and ones **1.NBT.2a** (D) - Demonstrate an understanding that 10 can be thought of as a bundle or group of 10 ones, called a ten **1.NBT.2b** (D) - Demonstrate an understanding that numbers from 11 to 19 are composed of a 10 and some more ones	The focus is relationships between numbers, combinations of numbers, number patterns, and a small collection of models that elicit such understanding. Mastery of key number facts and fact strategies for single-digit addition and subtraction. Emphasizes the concept of part-part-whole reasoning. Students are expected to be confident in number facts up to 10 and comfortable with number families to 20.	Understanding mathematical relationships is preferable to memorizing them. Important to focus on how students make mathematical meaning and the power of mathematical representations and models. The ability to subitize is central to a well-rounded sense of numbers and operational fluency in general Knowledge of part-whole relations is useful in problem contexts that involve either combining or separating numbers. Part-part-whole understanding leads students to see that the part is distinct from the whole without losing sight of the whole as it relates to its component parts

	1.NBT.4 (D) - Add a 1-digit number and a 2-digit number		

Unit 4 **Leapfrogs on the Number Line**	**Long-Term Outcomes/Transfer Goals:** ● **TG1:** Analyze and model mathematical relationships in authentic and varied contexts, make informed decisions, and draw conclusions. ● **CT.1:** Students will be able to analyze and evaluate evidence, arguments, claims and beliefs to draw conclusions, make informed decisions, and solve problems.		
	Standards Assessed	**Conceptual Overview**	**Rationale**
Focus & Timeframe Open and closed number lines are a model for adding and subtracting within 20 (20 days)	**1.OA.8** (D) - Solve for the unknown in an addition or subtraction equation involving 3 whole numbers **1.NBT.1** (D) - Count to 120, starting with any number less than 120, including 0 or 1 **1.NBT.1** (D) - Read and write numerals to 120 **1.NBT.4** (I) - Add a 1-digit number and a 2-digit number. Add a multiple of 10 (up to 80) and another 2-digit number. Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add with sums to 100 **1.NBT.5** (I) - Mentally find the number that is 10 more or 10 less than a given 2-digit number, without counting **1.NBT.6** (I) - Use concrete models or drawings to subtract a 2-digit multiple of 10 from an equal or greater	Students locate numbers on a number line, use their reasoning skills and number sense to determine unknown values, and explore addition and subtraction. Students develop a solid footing in counting, addition, and subtraction within the range of 0–120. The focus is on the number line as a model both to represent numbers and to add and subtract them using multiples of 1, 5, and 10.	The number line helps students develop greater flexibility in mental arithmetic as they actively construct mathematical meaning, number sense, and understandings of number relationships. When counting to 100 and beyond, passing a decade number (10, 20, 30, and so on), and counting backward are obstacles for students. So, It's important to equip students with many opportunities to choral count forward and backward by 1s, 5s, and 10s as well as opportunities to visualize our number system. For children to be able to calculate by structuring, they must be able to see the essential building blocks of our number system, and they must have a firm grasp of the base ten system, through which very predictable patterns emerge.

	2-digit multiple of 10. Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to subtract a 2-digit multiple of 10 from an equal or greater 2-digit multiple of 10		Unlike discrete grouping models, the number line is instrumental in helping students visualize number relationships and also use those visualizations in the act of counting and calculating.

Unit 5
Geometry

Long-Term Outcomes/Transfer Goals:

- **TG1:** Analyze and model mathematical relationships in authentic and varied contexts, make informed decisions, and draw conclusions.

- **CT.1:** Students will be able to analyze and evaluate evidence, arguments, claims and beliefs to draw conclusions, make informed decisions, and solve problems.

	Standards Assessed	Conceptual Overview	Rationale
Focus & Timeframe Identifying, describing, constructing, drawing, comparing, composing, and sorting two-dimensional shapes (20 days)	**1.G.1** (M) Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes. **1.G.2** (M) Create a composite shape by composing two-dimensional shapes and three-dimensional shapes **1.G.3** (M) Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares	The emphasis is squarely on shapes—identifying, describing, constructing, drawing, comparing, composing, and sorting them. Students learn about fractions in the context of two-dimensional shapes. A variety of shape-sorting activities are offered to help first graders understand that some of the things they observe about two- and three-dimensional shapes, such as number of sides or faces, number of vertices or corners, curved or flat surfaces, are properties that define those shapes.	According to the van Hieles theory (and students pass through certain levels) instruction must begin at a student's current level and provide many years of visual and exploratory work before moving into formal deductions. Experience with shapes, terms, and geometry-related concepts is the greatest single factor influencing advancement through the levels of geometric understanding. Activities that encourage children to explore, talk about, and interact with content at the next level, while increasing their experiences at the current level, have the best chance of advancing their thinking.

| | | | The fact that some pattern blocks are whole-number multiples of others makes it possible for young students to develop early understandings about measuring area. |
| | | | Studying algebra and geometry at any grade level helps to build the thinking skills of logic, deductive reasoning, analytical reasoning, and problem solving. Another connection is that geometry allows us to build and use visual models for algebraic operations. |

creates smaller shares.

Unit 6
Figure the Facts with Penguins

Long-Term Outcomes/Transfer Goals:
- **TG3:** Construct viable arguments, critique the reasoning of others, and communicate ideas precisely using the language of mathematics
- **CT.1:** Students will be able to analyze and evaluate evidence, arguments, claims and beliefs to draw conclusions, make informed decisions, and solve problems.
- **CO:** Students will be able to respectfully engage with others in constructive and critical dialogue, and take the initiative needed to accomplish a shared goal.

	Standards Assessed	Conceptual Overview	Rationale
Focus & Timeframe Addition and subtraction to 20 (*the unit more frequently emphasizes addition*) (20 days)	**1.OA.1** (M) - Solve addition and subtraction story problems with sums and minuends to 20 involving situations of adding to, putting together, taking from, taking apart, and comparing with unknowns in all positions **1.OA.4** (M) - Solve subtraction problems by finding an unknown addend **1.OA.6** (M) - Add and subtract with sums and minuends to 20. Add and subtract fluently with sums	During this unit students continue to develop fluency with addition and subtraction facts to 10 and strategies for working with facts to 20. Students make extensive use of the number rack to model and solve number combinations and story problems of all types. They learn how to write and solve equations that involve unknowns in all positions and determine whether addition and subtraction equations	Number rack explorations help students develop comfort with certain number facts as well as key strategies for addition and subtraction. Applying useful strategies that go beyond 1s counting. As students grapple with this number family in all its additive iterations, they make the natural associations to subtraction. This approach solidifies an understanding of what it actually means to add or to subtract—to combine or to

	to 10	are true or false.	separate.
	1.OA.7 (M) - Demonstrate an understanding that the equal sign indicates equivalence. Determine whether addition and subtraction equations are true	Students see the relationship between addition and subtraction operations, particularly within a specific number context.	
	1.OA.8 (M) - Solve for the unknown in an addition or subtraction equation involving 3 whole numbers		

Unit 7

One Hundred & Beyond

Long-Term Outcomes/Transfer Goals:

- **TG1:** Analyze and model mathematical relationships in authentic and varied contexts, make informed decisions, and draw conclusions.

- **TG3:** Construct viable arguments, critique the reasoning of others, and communicate ideas precisely using the language of mathematics

- **CT.1:** Students will be able to analyze and evaluate evidence, arguments, claims and beliefs to draw conclusions, make informed decisions, and solve problems.

	Standards Assessed	Conceptual Overview	Rationale
Focus & Timeframe Addition and subtraction of two-digit numbers (20 days)	**1.NBT.1** (M) - Count to 120, starting with any number less than 120, including 0 or 1. Read and write numerals to 120 **1.NBT.4** (M) - Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding	Continue to develop deep understandings of numbers to 120 -estimate, count, compare, add, and subtract two-digit quantities using familiar models: sticks & bundles; dimes, nickels, and pennies; and the number line. An emphasis on models that reinforce students' understandings of place value within the range of 0–120 and that fosters confidence with addition and subtraction strategies within this range. The number line, a continuous model used to introduce the idea of skip-counting by 2s, 5s and	Research has indicated that students with a solid understanding of 1, 2, 5, and 10 readily develop both formal and informal strategies for two-digit operations, particularly when those intervals are illustrated and manipulated on the open number line. If a child is comfortable counting by 1s, 2s, or 5s, there's no number she cannot conceptualize easily. Discrete counting models are closely tied not only to important place value concepts but also to widely taught addition and subtraction algorithms for double-digit computation.

	two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten **1.NBT.5** (D) - Mentally find the number that is 10 more or 10 less than a given 2-digit number, without counting **1.NBT.6** (D) - Subtract a 2-digit multiple of 10 from an equal or greater 2-digit multiple of 10	10s, is also used throughout the unit. Central to these mental manipulations is a strong sense of place value—how our number system works, how predictable patterns can help us navigate number contexts, and how strategies that work with small numbers are scalable to larger numbers.	The use of the number line as a computational tool is a connection to algebraic reasoning that should not be missed. It introduces symbols that have mathematical value, a significant step toward algebraic reasoning. Students must grapple with the beginnings of algebraic structure and symbolic language in the context of what would otherwise be simpler number equations.

Unit 8 **Changes, Changes**	**Long-Term Outcomes/Transfer Goals:** ● **TG2:** Persevere, think strategically/flexibly, and reflect and revise thinking in order to solve complex problems. ● **CT.2:** Students will be able to reflect on their own thinking when presented with alternative points of view, and revise and/or reconsider their thinking.

	Standards Assessed	**Conceptual Overview**	**Rationale**
Focus & Timeframe Consider the concept of change from several different angles (<20 days)	**1.NBT.1** (M) - Represent a number of objects with a written numeral up to 120 **1.NBT.3** (M) - Compare pairs of 2-digit numbers **1.NBT.4** (R/E) -Add a multiple of 10 (up to 80) and another 2-digit number. Use concrete models or drawings and strategies based on place value, properties of operations, or the relationship between addition and subtraction to add with sums to 100 **1.NBT.5** (M) - Mentally find the number that is 10 more or 10 less than a given 2-digit number, without counting	This unit integrates math and science, through activities that involve measurement, data analysis, and computing the amount of change, or the difference, between quantities. Students have many opportunities to measure distance with nonstandard units, develop further understanding of place value as they count cubes arranged much like a number line, find the difference between pairs of flight distances, and compile and interpret data in a real-world context rich with meaning for them.	Because the open number line is so closely related to the measuring tools students use throughout, and draws on their counting strategies and skills, it is a model that makes sense to many first graders. It is also a model used heavily in second grade, as students continue to develop number sense to 1,000 as well as increasingly efficient strategies for adding and subtracting 2- and 3-digit numbers. An algebraic function is a relationship between two variables in which the value of one variable, often called the output, depends on the value of the other, often called the input. This

	1.NBT.6 (M) - Subtract a 2-digit multiple of 10 from an equal or greater 2-digit multiple of 10		encourages them to search more actively for patterns; to look for the relationships between the input and output numbers rather than simply noting the patterns of increase.
	1.MD.2 (M) - Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.		
	1.MD.3 (M) -Tell time to the hour on an analog clock		
	1.MD.4 (M) - Interpret data with up to 3 categories, and answer questions about the data point		