



Bedford Public Schools

Kindergarten – Math

The kindergarten curriculum focuses on two main areas: Number Sense and Geometry. For Number Sense, students build on their knowledge and understanding of number names, the counting sequence and counting to tell the number of objects (up to 20). Students learn to use numbers, including written numerals, to represent quantities and solve problems. They count out a given number of objects and compare sets of objects to determine whether one set is greater than, less than or equal to each other. They compare two numbers between 1 and 10 presented as written numerals. They begin to model simple addition and subtraction situations with objects, fingers, words, actions, drawings, numbers and equations. For Geometry, students learn to describe and analyze the attributes of shapes. They find, count, draw, build, and compare shapes. They fit shapes together to make other shapes and complete puzzles. The kindergarten program emphasizes verbal interactions and manipulative activities while laying the groundwork for symbolic understanding.

Throughout all grades, there is an emphasis on the skills of mathematical practice that prepare children to be mathematically proficient students. These skills include making sense of problems and persevering in solving them, assessing how reasonable their answers are, explaining in words (both orally and in writing) their understanding and reasoning, attending to precision in both calculations and in math language, using appropriate math tools, and looking for and extending patterns.

Assessments happen in multiple ways routinely throughout the school year to measure student progress. Assessments consist of informal as well as formal teacher observations, small group interviews, individual interviews and checkpoints, and written tests. Student progress is monitored carefully to ensure proficiency in both the mathematical content and the practice standards that are expected at each grade level.



Learning Expectations

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Counting and Cardinality

<p>Enduring Understandings In order to meet the standards, the students will need to understand that . . .</p>	<p>Essential Questions In order to understand, students will need to consider questions such as . . .</p>	<p>Knowledge and Skills Learning this material will require students to . . .</p>
<p>Know Number Names and the Count Sequence</p> <ul style="list-style-type: none"> • There is a unique symbol that goes with each number. • There is a specific order to the set of whole numbers. • Our number system (the Base Ten numeration system) uses the symbols 0-9 and place value to build all our numbers. • The decade numbers are built on groups of tens. The oral names are similar, but not exactly the same, as the number of tens counted. • Counting tells how many are in a set, regardless of their arrangement or the order in which they appear. • The last number said when counting a set is the total. • Zero is a number that tells how many objects when there are none. • Each successive number name refers to a quantity that is one larger. • Numbers can be used to tell an order (ordinal numbers). Positions in a row can be found by counting. • Ordinal names are similar to number names in most circumstances. 	<ul style="list-style-type: none"> • What are numbers? • How can numbers from 1-20 be counted, read, and written? • How can numbers up to 100 be counted by ones? • What number name can be given to a set of objects? • How are numbers named and quantities related? 	<ul style="list-style-type: none"> • Count to 100 by ones and tens. • Count forward beginning from a given number within the known sequence (instead of having to begin at 1). • Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects). • Understand the relationship between numbers and quantities; connect counting to cardinality. • When counting objects, say the number names in standard order, pairing each object with one and only one number name and each number name with one and only one object. • Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. • Understand that each successive number name refers to a quantity that is one larger. • Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.

Counting and Cardinality (cont.)

<p>Enduring Understanding In order to meet the standards, the students will need to understand that . . .</p>	<p>Essential Questions In order to understand, students will need to consider questions such as . . .</p>	<p>Knowledge and Skills Learning this material will require students to . . .</p>
<p style="text-align: center;">Compare Numbers</p> <ul style="list-style-type: none"> • If you compare two groups of objects and the number of objects match, then the objects have the same number. If you compare two groups of objects and one group has items that are left over, that group has more. The other group has fewer. • In a pair of numbers, the number that shows more is “greater”, and the number that shows fewer is “less”. • “1 more than”, “1 less than”, “2 more than”, “2 less than”, etc., expresses a relationship between two numbers. 	<ul style="list-style-type: none"> • What strategies can be used to compare numbers? • How can the numbers from 0-5 be compared and ordered? • How can the numbers from 6-10 be compared and ordered? 	<ul style="list-style-type: none"> • Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group (up to ten objects). • Compare two numbers between 1 and 10 presented as written numerals.

Operations and Algebraic Thinking

<p>Enduring Understanding In order to meet the standards, the students will need to understand that . . .</p>	<p>Essential Questions In order to understand, students will need to consider questions such as . . .</p>	<p>Knowledge and Skills Learning this material will require students to . . .</p>
<p>Understand Addition As Putting Together and Adding to, and Understanding Subtraction as Taking Apart and Taking From</p> <ul style="list-style-type: none"> • Joining parts to make a whole is one interpretation of addition. • Increasing a given amount by another amount is another interpretation of addition. • Joining groups can be shown in an addition expression that uses the plus (+) sign (i.e. $4 + 1$). • Addition sentences can be used to show parts of a whole (i.e. $4 + 1 = 5$). • Taking parts of a group away is one interpretation of subtraction. • Comparing two quantities to find how much more or less one quantity is than another is one interpretation of subtraction. • Separating, taking away and comparisons can be shown in a subtraction expression that uses the minus (-) sign (i.e. $5 - 1$). • Subtraction number sentences using (-) and (=) can be used to show subtraction (i.e. $5 - 1 = 4$). • There is more than one way to show a number. <p style="text-align: center;">Patterns</p> <ul style="list-style-type: none"> • Patterns are all around us. • Patterns can be made with colors, rhythms, shapes, numbers, and letters that repeat. 	<ul style="list-style-type: none"> • What types of situations involve addition? • What types of situations involve subtraction? • What are different ways that addition and subtraction situations can be represented? • How can addition and subtraction situations be recorded? • What are the different ways to make a number? • How can simple attributes be repeated to create patterns? 	<ul style="list-style-type: none"> • Represent addition and subtraction with objects, fingers, mental images, sounds (i.e. claps), acting out situations, verbal explanations, expressions or equations. • Solve addition and subtraction word problems, and add and subtract within 10 by using objects or drawings to represent the problem. • Decompose numbers less than 10 into pairs in more than one way by using objects or drawings, and record each decomposition by a drawing or equation (i.e. $5 = 2 + 3$ and $5 = 4 + 1$). • For any number from 1 to 9, find the number that makes 10, when added to the given number by using objects or drawings, and record the answer with a drawing or equation. • Fluently* add and subtract within 5. <i>* Fluency is used in the standards as meaning “fast and accurate”. Fluency is a mixture of just knowing some answers, knowing some answers from patterns, and knowing some answers from the use of strategies.</i> • Identify, reproduce, describe, extend, and create color, rhythmic, shape, number and letter repeating patterns with simple attributes (i.e. ABABAB).

Number and Operations in Base Ten

<p>Enduring Understanding In order to meet the standards, the students will need to understand that . . .</p>	<p>Essential Questions In order to understand, students will need to consider questions such as . . .</p>	<p>Knowledge and Skills Learning this material will require students to . . .</p>
<p>Work with Numbers 11-19 to Gain Foundations for Place Value</p> <ul style="list-style-type: none"> • The numbers 11-19 can be represented as the sum of 10 and some more. • The numbers 11-19 can be decomposed to a ten and some more (i.e. $15 = 10 + 5$). 	<ul style="list-style-type: none"> • What are the teen numbers? • How can you add one ten and some ones to make the numbers from 11 to 19? • What are different ways to represent and record the teen numbers? 	<ul style="list-style-type: none"> • Compose and decompose numbers from 11-19 into ten ones and some further ones, i.e. by using objects or drawings, and record each composition or decomposition by drawing or writing equations (i.e. $18 = 10 + 8$); understand that these numbers are composed of ten ones and one – nine ones.

Measurement and Data

<p>Enduring Understanding In order to meet the standards, the students will need to understand that . . .</p>	<p>Essential Questions In order to understand, students will need to consider questions such as . . .</p>	<p>Knowledge and Skills Learning this material will require students to . . .</p>
<p>Describe and Compare Measurable Attributes</p> <ul style="list-style-type: none"> • Objects have measurable attributes, such as length and weight that can be described and compared (i.e. height is similar to length). • Attributes can be used to compare objects. 	<ul style="list-style-type: none"> • What are measurable attributes? • What is length? • What is height? • What is weight? • How can objects be compared and ordered by length, height or weight? 	<ul style="list-style-type: none"> • Describe measurable attributes of objects, such as length or weight. • Describe several measurable attributes of a single object. • Directly compare two objects with a measurable attribute in common, to see which object has “more of” or “less of” the attribute, and describe the difference.
<p>Classify Objects and Count the Number of Objects in Each Category</p> <ul style="list-style-type: none"> • Attributes such as size, color, shape or number can be used to classify and sort objects into different categories. • Attributes such as size, color, or shape can be used to sort the same set of objects in different ways. • A set of objects can be sorted according to a combination of attributes. 	<ul style="list-style-type: none"> • How can objects be classified and sorted? • What attributes can be used to sort objects into given categories? 	<ul style="list-style-type: none"> • Classify objects into given categories; count the numbers of objects in each category and sort the categories by count up to 10.

Geometry

Enduring Understanding In order to meet the standards, the students will need to understand that . . .	Essential Questions In order to understand, students will need to consider questions such as . . .	Knowledge and Skills Learning this material will require students to . . .
<p>Identify and Describe Shapes (Squares, Circles, Triangles, Rectangles, Hexagons, Cubes, Cones, Cylinders, and Spheres)</p> <ul style="list-style-type: none"> • The position of objects can be determined in relation to surrounding objects and described using words. • Geometric figures have specific names. • Two-dimensional “flat” figures can have straight sides or rounded curves. • Three-dimensional figures are solid and have length, width and height. 	<ul style="list-style-type: none"> • What words can be used to describe the position and location of shapes? • How can shapes be named and described? • What is the difference between “flat” (two-dimensional) shapes and “solid” (three-dimensional) shapes? 	<ul style="list-style-type: none"> • Describe objects in the environment using names of shapes, and describe the relative position of these objects using such terms as above, below, beside, in front of, behind, and next to. • Correctly name shapes regardless of their orientations or overall size. • Identify shapes as “flat” (two-dimensional) shapes or “solid” (three-dimensional) shapes.