



ANNA L. KLEIN SCHOOL
Guttenberg School District
A Great Place to Work and Learn

Kindergarten
Math Curriculum
Revised 12/2017

Counting and Cardinality

K.CC – Counting and Cardinality

A. Know number name and the count sequence

New Jersey Student Learning Standards #	NJSLS Standard
K.CC.A.1	Count to 100 by ones and by tens.
K.CC.A.2	Count Forward beginning from a given number within the known sequence (instead of having to begin at 1.)
K.CC.A.3	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).

B. Count to tell the number of objects

New Jersey Student Learning Standards #	NJSLS Standard
K.CC.B.4	Understand the relationship between numbers and quantities; connect counting to cardinality.
K.CC.B.4.a	When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
K.CC.B.4.b	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.
K.CC.B.4.c	Understand that each successive number name refers to a quantity that is one larger.
K.CC.B.5	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.

C. Compare numbers

New Jersey Student Learning Standards #	NJSLS Standard
K.CC.C.6	Identify whether the number of objects in one group is greater than, less, than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.
K.CC.C.7	Compare two numbers between 1 and 10 presented as written numerals.

21st Century Life and Career (Standard 9) and/or Technology Standard (Standard 8)

8.1 All students will develop an understanding of the nature and impact of technology, engineering, technological design and the designed world as they relate to the individual, global society, and the environment.

9.1 All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills need to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

Standard	
8.1.2.A.5	Demonstrate the ability to navigate in developmentally appropriate virtual environments.
8.1.2.B.1	Illustrate and communicate original ideas and stories using digital tools and media-rich resources.
9.1.4.A.1	Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.

Essential Questions

1. Why do we use numbers, what are their properties, and how does our number system function?
2. Why do we use estimation and when is it appropriate?
3. What makes a strategy effective and efficient and the solution reasonable?
4. How do numbers relate and compare to one another?

Enduring Understandings

<i>Students will know...</i>	<i>Students will understand...</i>	<i>Students will be able to...</i>
<ol style="list-style-type: none"> 1. Number names 2. What a rote number sequence is 3. Numerals represent a quantity of objects. 4. How to read a numeral 5. Each number is matched to an object. 6. How many? 7. Greater than, less than, or equal to 8. How to count 9. The value of the numeral 	<ol style="list-style-type: none"> 1. That patterns of numbers help when counting. 2. That there are different ways to count (by ones, tens). 3. Written numbers represent an amount. 4. The last number name said tells the number of objects counted. 5. The number of objects is the same regardless of their arrangement or the order in which they were counted. 6. That each successive number name refers to a quantity that is one larger. 7. That groups of objects can be compared to one another to determine whether they are greater than, less than, or equal to each other. 	<ol style="list-style-type: none"> 1. Count to 100 by ones and by tens. 2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1). 3. 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). 4. Begin a rote forward counting sequence from a number other than 1. 5. Use number names and the count sequence. 6. Write numbers to describe the amount of a set of objects 7. Represent a set of objects with a written numeral. The number of objects should not be greater than 20 8. Use number names and the count sequence. 9. Count objects, saying the names in the standard order, pairing each object with one and only one number name and each number with one and only one object. (one-to-one correspondence). 10. Count 1-20 to tell the number of objects in a variety of arrangements. 11. Compare numerals 1 - 10 12. Use matching and counting strategies to compare groups of objects. 13. Apply their understanding of numerals 1 – 10 to compare one to another.

Activities, Investigation, and Student Experiences	Equipment Needed	Teacher Resources:
<p>Activity that involves the students in grouping objects in groups of ten.</p> <p>Explore manipulatives: unifix cubes, pattern blocks, teddy bear counters, attrilinks, attribute blocks, color tiles, etc....</p> <p>Counting out loud via song, pattern, clapping, etc...</p> <p>Bring in 100 objects, count out by 1's and 10's (100th Day of School)</p> <p>Understand and Explore 100s chart color in tens or cut out tens columns.</p> <p>Trace numbers in sand.</p> <p>Draw pictures to show how many</p> <p>Use a number line to count forward from a given number.</p> <p>Organize pictures and draw lines to math to determine greater/less than.</p> <p>Role play number stories to ID</p>	<p>Various manipulatives, such as cubes, unifix cubes, pattern blocks, teddy bear counters, attrilinks, attribute blocks, color tiles, etc</p> <p>Interactive whiteboards (smart-boards)</p> <p>Paper/ Pencil</p> <p>Reference Charts</p> <p>Academic Math Vocabulary Word Wall</p> <p>Technology such as tablets or chromebooks (when applicable)</p>	<p>Think Central</p> <p>brainpop.com</p> <p>PBS Kids</p> <p>ABCya.com</p> <p>Youtube.com</p> <p>Math in Focus Series</p> <p>TeacherspayTeachers.com</p> <p>Ecchange.smarttech.com</p> <p>Math in Focus Series</p>

Operations and Algebraic Thinking

K.OA – Operations and Algebraic Thinking

A. Understand addition as putting together and adding to, and understanding subtraction as taking apart and taking from

New Jersey Student Learning Standards #	NJSLS Standard
K.OA.A.1	Represent addition and subtraction up to 10 with objects, fingers, mental images, drawings, sounds,(e.g., claps), acting out situations, verbal explanations, expressions, or equations.
K.OA.A.2	Solve addition and subtraction word problems, and add and subtract with 10, e.g., by using objects or drawings to represent the problem.
K.OA.A.3	Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., $5=2+3$ and $5=4+1$).
K.OA.A.4	For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.
K.OA. A. 5	Demonstrate fluency for addition and subtraction within 5.

Essential Questions

1. Why do I need to add and subtract?
2. How can you combine 2 sets to make 1 larger set?
3. What happened when you remove one set?
4. How many objects are in this set?
5. How do you use patterns to understand mathematics and model situations?
6. What is algebra?
7. How do algebraic representations relate and compare to one another?
8. How can we communicate and generalize algebraic relations?
9. What happened when we combine groups?

Enduring Understandings

Students will know...

1. That objects can be joined (addition) and separated (subtraction) by representing addition and subtraction situations in various ways.
2. There are three types of problems, result unknown, and change unknown, start unknown.
3. That objects can be broken into two sets and still have the same total amount.
4. That a set of objects can be broken in multiple ways (e.g., 5 can be 3 and 2 or 4 and 1).

Students will understand...

1. The concepts of additions and subtraction, rather than merely reading and solving addition and subtraction number sentences (equations).
2. When breaking apart a set (decomposing) that a smaller set of objects exists within the larger set (inclusion).
3. That a number can be decomposed into parts (k.OA.A.3) by finding a missing part of 10.
4. That there are a variety of ways to represent numbers up to 5.
5. That quantities can be taken apart and put together to add or subtract in a kindergarten level.
6. That mathematical problems can be solved in more than one way.

Students will be able to...

1. Solve an addition or subtraction problem using a variety of strategies (manipulatives, drawings, etc.).
2. Solve problems that are presented in a story format (context) with a specific emphasis on using objects or drawings to determine the solution.
3. Build upon their understanding from K.OA.1 to solve problems.
4. Use a variety of strategies to find the missing number when presented with a problem.
5. Accurately, efficiently, and flexibly add and subtract within 5.
6. Create addition events with drawings and sounds (up to 10).
7. Use part-part-whole mats, ten frames, number lines, calendar, and hundred chart to count.

Activities, Investigation, and Student Experiences	Equipment Needed	Teacher Resources:
<p>Students will use manipulative or pictures to demonstrate, read, and explain addition and subtraction sentences written symbolically involving numbers 0-5</p> <p>Retell, act out, solve and record a variety of addition and subtraction number stories.</p> <p>Sort students into boys and girls, create addition sentences.</p> <p>Use objects to model addition.</p> <p>Use variety of manipulatives to compose and decompose numbers</p> <p>Use literature and number songs to act out addition and subtraction stories</p>	<p>Interactive whiteboards (smart-boards)</p> <p>Math workbooks</p> <p>Paper / Pencil</p> <p>Reference Charts</p> <p>Number lines</p> <p>Academic Math Vocabulary Word Wall</p> <p>Technology such as tablets or chromebooks (when applicable)</p> <p>Various manipulatives, such as cubes, unifix cubes, pattern blocks, teddy bear counters, attrilinks, attribute blocks, color tiles, stickers, straws, etc</p>	<p>Think Central</p> <p>brainpop.com</p> <p>PBS Kids</p> <p>ABCya.com</p> <p>Youtube.com</p> <p>Math in Focus Series</p> <p>TeacherspayTeachers.com</p> <p>Ecchange.smarttech.com</p> <p>Math in Focus series</p>

Number and Operations in Base Ten
K.NBT – Number and Operations in Base Ten

A. Work with numbers 11-19 to gain foundations for place value

New Jersey Student Learning Standards #	NJSLS Standard
K.NBT.A.1	Compose and decompose numbers 11-19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., $18=10+8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

Essential Questions		
<ol style="list-style-type: none"> 1. How does the position of a digit in a number affect its value? 2. In what ways can numbers be composed and decomposed? 3. How are place value patterns repeated in number? 4. How can a number be represented in different ways? 5. Why are numbers important? 		
Enduring Understandings		
<i>Students will know...</i> <ol style="list-style-type: none"> 1. Numbers 11-20 can be represented in number and word form. 2. Numbers 11-20 can be combined and broken into tens and ones. 	<i>Students will understand...</i> <ol style="list-style-type: none"> 1. Counting is cumulative no matter which order the objects are counted. 2. There is a unique symbol that goes with each number word. 3. There is more than one way to show/write a number. 4. Numbers are used in our everyday lives. 5. Each group of tens can be thought of as ten ones. 6. Two digits of a two digit number represent amounts of ten and ones. 	<i>Students will be able to...</i> <ol style="list-style-type: none"> 1. Count, read, and write numbers 11-20. 2. Compose (combine) and decompose (break down) numbers 11-20 into tens and ones. 3. Record and solve problems by drawing or equation. 4. Count on.

Activities, Investigation, and Student Experiences	Equipment Needed	Teacher Resources:
<p>Draw pictures to illustrate addition and subtraction stories</p> <p>Use connecting cubes to compose and decompose numbers to 20</p> <p>Use ten frames to illustrate given number</p> <p>Using straws or popsicle sticks bundle groups of ten and sort them in place value pocket chart.</p> <p>Use base ten blocks to add on ones and show place value.</p> <p>Have one child hold up ten fingers and another child hold up four fingers to demonstrate a two digit number.</p> <p>Narrate base ten number stories and have students act out stories.</p>	<p>Interactive whiteboards (smart-boards)</p> <p>Math workbooks</p> <p>Paper / Pencil</p> <p>Reference Charts</p> <p>Number lines</p> <p>Academic Math Vocabulary Word Wall</p> <p>Technology such as tablets or chromebooks (when applicable)</p> <p>Various manipulatives, such as cubes, unifix cubes, pattern blocks, teddy bear counters, attrilinks, attribute blocks, color tiles, stickers, straws, etc</p>	<p>Think Central</p> <p>brainpop.com</p> <p>PBS Kids</p> <p>ABCya.com</p> <p>Youtube.com</p> <p>Math in Focus Series</p> <p>TeacherspayTeachers.com</p> <p>Ecchange.smarttech.com</p> <p>Math in Focus series</p>

Measurement and Data

K.MD – Measurement and Data

A. Describe and compare measureable attributes

New Jersey Student Learning Standards #	NJSLS Standard
K.MD.A.1	Describe measureable attributes of objects, such as length or weight. Describe several measureable attributes of a single objects.
K.MD.A.2	Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. <i>For example, directly compare the heights of two children and describe one child as taller/shorter.</i>

B. Classify objects and count the number of objects in each category.

New Jersey Student Learning Standards #	NJSLS Standard
K.MD.B.3	Classify objects into given categories; count the numbers of objects in each category and sort the categories by count

21st Century Life and Career (Standard 9) and/or Technology Standard (Standard 8)

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9.1 All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills need to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

Standard	
8.1.2.A.5	Demonstrate the ability to navigate in developmentally appropriate virtual environments.
8.1.2.B.1	Illustrate and communicate original ideas and stories using digital tools and media-rich resources.
9.1.4.A.1	Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.

Essential Questions

- 1. Why is it important to know how to measure?
- 2. How can objects be compared?

Enduring Understandings

Students will know...

- 1. The length and weight of objects can be compared, ordered and measured.
- 2. The difference between two objects can be determined and described as “more of”/”less of”
- 3. Objects can be identified as either the same or different
- 4. Objects can be classified, counted and sorted into given categories based on their attributes.

Students will understand...

- 1. Measurement can be used to describe the length and weight of an object.
- 2. The attributes of an object help to describe and identify the object.

Students will be able to...

- 1. Compare, order and measure the length and weight of objects
- 2. Determine and describe the difference between two objects using “more of”/”less of”
- 3. Identify, sort and determine how objects are the same and different.
- 4. Classify, count and sort objects by attributes into given categories.

Activities, Investigation, and Student Experiences	Equipment Needed	Teacher Resources:
<p>Use tangrams to sort by shape, color and size</p> <p>Role play sorting stories using students</p> <p>Use students own feet to measure objects and record their answers using non-standard units.</p> <p>Children can build a structure with blocks and measure the length.</p> <p>Children can use a scale to record such thing as their weight, and other objects.</p> <p>Measure how many steps it takes to reach a particular place, e.g. front door, their desks, play ground, etc.</p> <p>Use nonstandard units to compare the height of a plant over time.</p> <p>Measure classroom objects using non standard units..</p>	<p>Interactive whiteboards (smart-boards)</p> <p>Math workbooks</p> <p>Paper / Pencil</p> <p>Reference Charts</p> <p>Number lines</p> <p>Academic Math Vocabulary Word Wall</p> <p>Technology such as tablets or chromebooks (when applicable)</p> <p>Various manipulatives, such as cubes, unifix cubes, pattern blocks, teddy bear counters, attrilinks, attribute blocks, color tiles, stickers, straws, etc</p>	<p>Think Central</p> <p>brainpop.com</p> <p>PBS Kids</p> <p>ABCya.com</p> <p>Youtube.com</p> <p>Math in Focus Series</p> <p>TeacherspayTeachers.com</p> <p>Ecchange.smarttech.com</p> <p>Math in Focus series</p>

Geometry

K.G – Geometry

A. Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders and spheres).

New Jersey Student Learning Standards #	NJSLS Standard
K.G.A.1	Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as <i>above</i> , <i>below</i> , <i>beside</i> , <i>in front of</i> , <i>behind</i> , and <i>next to</i> .
K.G.A.2	Correctly name shapes regardless of their orientations or overall size.
K.G.A.3	Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”).

B. Analyze, compare, create, and compose shapes.

New Jersey Student Learning Standards #	NJSLS Standard
K.G.B.4	Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/“corners”) and other attributes (e.g., having sides of equal length).
K.G.B.5	Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
K.G.B.6	Compose simple shapes to form larger shapes. <i>For example, “Can you join these two triangles with full sides touching to make a rectangle?”</i>

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Essential Questions

- 1. Why are position words important?
- 2. How are shapes and solids connected to our everyday lives?
- 3. What materials can use to construct a real world example?
- 4. How do we use materials to model shapes in the world?
- 5. How are these two shapes different?
- 6. How are these two shapes alike?
- 7. How many sides do particular shapes have?
- 8. What shapes stack, roll and slide?
- 9. What kinds of objects lie flat?
- 10. What kinds of objects are solid?
- 11. What attributes do certain shapes have?

Enduring Understandings

Students will know...

- 1. Shapes in the environment can be identifies, named and described.
- 2. Two-dimensional shapes are flat and three-dimensional shapes are solid.
- 3. Smaller shapes can be put together to form larger shapes.
- 4. Compare and describe two and three dimensional shapes.

Students will understand...

- 1. Numbers can be used to tell the position of objects in a sequence.
- 2. Two dimensional and three dimensional shapes have specific attributes that help to identify each shape.
- 3. Geometry and special sense offer ways to interpret and construct on our physical environment
- 4. The properties of two and three dimensional shapes.
- 5. The language between two dimensional and three dimensional shapes

Students will be able to...

- 1. Identify, name and describe shapes in their environment.
- 2. Explore and identify two-and three dimensional shapes.
- 3. Build and draw simple shapes.
- 4. Compare two-and-three dimensional shapes.
- 5. Form larger shapes from smaller shapes.
- 6. Construct real world examples of each solid shape shown in a picture.
- 7. Use properties and characteristics of two and three dimensional shapes to describe relationships, communicate ideas and solve problems.

Activities, Investigation, and Student Experiences	Equipment Needed	Teacher Resources:
<p>List shapes in environment</p> <p>Use wooden blocks</p> <p>Paint and/or use clay to form shapes</p> <p>Use tangrams to create pictures from shapes</p> <p>List combination of shapes in environment</p> <p>Teacher will instruct students to place an object using direction word in a specific location</p> <p>Make a robot out of geometric shapes.</p> <p>Give children a specific geometric shape and have them find objects around the classroom that are the same shape.</p> <p>Sort shapes into sets with the same attributes</p> <p>Make a model of your home using clay or play doh</p>	<p>Interactive whiteboards (smart-boards)</p> <p>Math workbooks</p> <p>Paper / Pencil</p> <p>Reference Charts</p> <p>Number lines</p> <p>Academic Math Vocabulary Word Wall</p> <p>Technology such as tablets or chromebooks (when applicable)</p> <p>Various manipulatives, such as cubes, unifix cubes, pattern blocks, teddy bear counters, attrilinks, attribute blocks, color tiles, stickers, straws, etc</p> <p>3D geometric shapes</p> <p>Geometric solid shapes</p>	<p>Think Central</p> <p>brainpop.com</p> <p>PBS Kids</p> <p>ABCya.com</p> <p>Youtube.com</p> <p>Math in Focus Series</p> <p>TeacherspayTeachers.com</p> <p>Ecchange.smarttech.com</p> <p>Math in Focus series</p>

Activities, Investigation, and Student Experiences	Equipment Needed	Teacher Resources:
<p>Take a school walk and draw or illustrated different structures they see.</p> <p>A group of children are given play doh or shape blocks and asked to create as many shapes as they can.</p> <p>Draw shapes in sand.</p> <p>After constructing a real world structures, students must identify shapes used.</p> <p>Select a shape such as a cylinder and have the child explore the shape and describe its properties, (it can stack, slide, edges, etc).</p> <p>Game play "Which Shape am I?" Give clues to a specific shape and have students guess.</p> <p>Make a 2D and 3D story book</p> <p>Ask children which block shapes would roll down the ramp that was created in the block area.</p> <p>Make a shape collage, using a magazine.</p> <p>Place different shapes in a bag and have child pull out a shape and name it.</p>	<p>Interactive whiteboards (smart-boards)</p> <p>Math workbooks</p> <p>Paper / Pencil</p> <p>Reference Charts</p> <p>Number lines</p> <p>Academic Math Vocabulary Word Wall</p> <p>Technology such as tablets or chromebooks (when applicable)</p> <p>Various manipulatives, such as cubes, unifix cubes, pattern blocks, teddy bear counters, attrilinks, attribute blocks, color tiles, stickers, straws, etc</p>	<p>Think Central</p> <p>brainpop.com</p> <p>PBS Kids</p> <p>ABCya.com</p> <p>Youtube.com</p> <p>Math in Focus Series</p> <p>TeacherspayTeachers.com</p> <p>Ecchange.smarttech.com</p> <p>Math in Focus series</p>