Kindergarten

Mathematics – Kindergarten: Critical Areas

In Kindergarten, instructional time should focus on two critical areas: (1) representing and comparing whole numbers, initially with sets of objects; (2) describing shapes and space. More learning time in Kindergarten should be devoted to number than to other topics.

1. Students use numbers, including written numerals, to represent quantities and to solve quantitative problems, such as counting objects in a set; counting out a given number of objects; comparing sets or numerals; and modeling simple joining and separating situations with sets of objects, or eventually with equations such as 5 + 2 = 7 and 7 – 2 = 5. (Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten is encouraged, but it is not required.) Students choose, combine, and apply effective strategies for answering quantitative questions, including quickly recognizing the cardinalities of small sets of objects, counting and producing sets of given sizes, counting the number of objects in combined sets, or counting the number of objects that remain in a set after some are taken away.

2. Students describe their physical world using geometric ideas (e.g., shape, orientation, spatial relations) and vocabulary. They identify, name, and describe basic two-dimensional shapes, such as squares, triangles, circles, rectangles, and hexagons, presented in a variety of ways (e.g., with different sizes and orientations), as well as three-dimensional shapes such as cubes, cones, cylinders, and spheres. They use basic shapes and spatial reasoning to model objects in their environment and to construct more complex shapes.

- Major Clusters |
- Supporting |
- Additional Clusters |
- * Benchmarked Standard

Vocabulary: Building the Language of Mathematics for Students

Kindergarten

Counting and Cardinality	Operations and Algebraic Thinking	Number and Operations in Base Ten	Measurement and Data	Geometry
Know number names and the count sequence. Introduce written number words zero, one, two…ten (students are not responsible for being able to read these words, but they should be introduced) Know digits and orally count to one hundred **Count to tell the number of objects.** number, zero, one, two…thirteen, fourteen…nineteen How many? count on **Compare numbers.** greater than, more, less than, fewer equal to, same amount as, compare	**Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.** join, putting together, add, adding to, separate, subtract, taking apart, taking from, and same amount as, equal, less than, more than, total, count on	**Work with numbers 11–19 to gain foundations for place value.** ones, number, leftovers (Know digits and recognize number words when spoken orally to twenty)	**Describe and compare measurable attributes.** compare, attribute, length, weight, heavy(ier), light(er), long(er), big, small(er), more of, less of, tall(er), short(er) **Classify objects and count the number of objects in categories.** compare, sort, category, color words (blue, green, red, etc.), descriptive words (small, big, rough, smooth, bumpy, round, flat, etc.), more, less, same amount	**Identify and describe shapes.** Square, circles, triangle, rectangles, hexagon, cubes, cones, cylinder, sphere, flat, solid, side, corner, angle, edge, face, Above, below, beside, in front of, behind, next to, same, different, straight lines, curved (curvy) lines **Analyze, compare, create, and compose shapes.** compare, compose, attributes, sides, vertices/corners, vertex, two-and three-dimensional, same, different

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● Major Clusters | ● Supporting |

● Additional Clusters | * Benchmarked Standard

The Common Core State Standards for Mathematical Practice are practices expected to be integrated into every mathematics lesson for all students Grades K-12. Below are a few examples of how these Practices may be integrated into tasks that Kindergarten students complete.

Practice Explanation and Example

MP1) Make Sense and Persevere in Solving Problems. Mathematically proficient students in Kindergarten begin to build the understanding that doing mathematics involves solving problems and discussing how they solved them. Students explain to themselves the meaning of the problem and look for ways to solve it. Students in Kindergarten use concrete objects or pictures to help them conceptualize and solve problems. Kindergarten students also are expected to persevere while solving tasks; that is, if students reach a point in which they are stuck, they don't "give up", they try another strategy. For example, young students might use concrete objects or pictures to show the actions of a problem or seeing a way to begin, they ask questions that will help them get started.

MP2) Reason abstractly and quantitatively. Mathematically proficient students in Kindergarten begin to recognize that a number represents a specific quantity. Then, they connect the quantity to objects and written symbols. Quantitative reasoning entails creating a representation of a problem while attending to the meanings of the quantities. For example, Kindergartners use concrete objects to "act out" a context, they represent the problem with mathematical objects or symbols. This is also an example of modeling with mathematics (MP 4).

MP3) Construct viable arguments and critique the reasoning of others. Mathematically proficient students in Kindergarten construct arguments using concrete objects, pictures, drawings, and actions. They begin to develop their mathematical communication skills as they participate in mathematical discussions. Questions like "How did you get that?" and "Why is that true?" encourage them to explain their thinking to others and respond to others' thinking. For example, in order to demonstrate what happens to the sum when the same amount is added to one addend and subtracted from another, students might represent a story about children moving between two classrooms: the number of children in each classroom is an addend; the total number of children in the two classrooms is the sum. When some students move from one classroom to the other, the number of students in each classroom changes by that amount—one addend decreases by some amount and the other addend increases by that same amount—but the total number of students does not change. Standards for Mathematical Practice in Kindergarten

MP4) Model with mathematics. Mathematically proficient students in Kindergarten can apply the mathematics they know to solve problems that arise in everyday life. This might be as simple as writing an addition equation to describe a situation or using concrete

objects to “show” the situation. Kindergartners experiment with representing problem situations in multiple ways including numbers,

words (mathematical language), drawing pictures, using objects, acting out, making a chart or list, creating equations, etc. Students need many opportunities to connect the different representations and explain the connections. They should be able to use all of these representations as needed. For example, they might arrange counters to solve problems such as this one: there are seven animals in the yard, some are dogs and some are cats, how many of each could there be? They are using the counters to model the mathematical elements of the contextual problem—that they can split a set of 7 into a set of 3 and a set of 4. When they learn how to write their actions with the counters in an equation, 4 + 3 = 7, they are modeling the situation with numbers and symbols.

MP5) Use appropriate tools strategically. Mathematically proficient students in Kindergarten begin to consider the available tools (including estimation) when solving a mathematical problem and decide when certain tools might be helpful. For instance, kindergarteners may decide that it might be advantageous to use linking cubes to represent two quantities and then compare the two representations side-by-side. The tools that Kindergartners might use include physical objects (cubes, geometric shapes, place value manipulatives, etc.) drawings or diagrams (number paths, tally marks, tape diagrams, arrays, tables, etc.) paper and pencil, rulers and other measuring tools, scissors, tracing paper, or other available technologies.

MP6) Attend to precision. Mathematically proficient students in Kindergarten start by using everyday language to express their mathematical ideas and begin to develop their communication skills. They try to use clear and precise language in their discussions with others and in their own reasoning. For example, students can “show” and “explain” that the equivalence of 8 and 5 + 3 can be written both as 5 + 3 = 8 and 8 = 5 + 3. They “show” this relationship using concrete objects. Similarly, the equivalence of 6 + 2 and 5 + 3 is expressed as 6 + 2 = 5 + 3.

MP7) Look for and make use of structure. Mathematically proficient students in Kindergarten look for patterns and structures in numbers, place value, properties of operations, etc. They USE structure to solve problems. Examples: The less you subtract, the greater the difference. Recognizing that adding 1 results in the next counting number, and recognizing the pattern that exists in the teen numbers; every teen number Is written with a 1 (representing one ten) and ends with the digit that is first stated. They also recognize that 3 + 2 = 5 and 2 + 3 = 5.

MP8) Look for and express regularity in repeated reasoning. Mathematically proficient students in Kindergarten notice repetitive actions in counting and computation, etc. and find shortcuts. For example, they may notice that the next number in a counting sequence is “one more”. When counting by tens, the next number in the sequence is “ten more” (or one more group of ten) or they notice that when tossing two-colored counters to find combinations of a given number, they always get what they call “opposites”—when tossing 6 counters, they get 2 red, 4 yellow and 4 red, and 2 yellow and when tossing 4 counters, they get 1 red, 3 yellow and 3 red, 1 yellow. Or on a Ten Frame,

with 8 counters, they notice there are 2 spaces, or with 4 counters on the Ten Frame, there are 6 spaces. As they look for and explain their reasoning they continually ask themselves, “Does this make sense”?

Pacing Guide - Year-at-a-Glance - Timing based upon 4 Marking Periods at 9 weeks each

Pacing Guide	Standards for Mathematical Content	Unit Focus	Standards for Mathematical Practice
Unit 1 - 9 weeks **Connecting Counting to Cardinality**	● K.CC.A.1* ● K.CC.A.3* ● K.CC.B.4 ● K.CC.B.5* ● K.OA.A.1* ● K.MD.B.3* ● K.G.A.1	● Know number names and the count sequence to 10 ● Count to tell the number of objects ● Understand addition as putting together and adding to and understand subtraction as taking apart and taking from ● Identify and describe shapes	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics.
Unit 1: **Suggested Open Educational Resources**	K.CC.A.1 Counting Circles K.CC.A.1 Choral Counting K.CC.A.3 Number TIC TAC TOE K.CC.B.4 Counting Mat K.CC.B.5 Finding Equal Groups K.OA.A.1 Ten Frame Addition K.MD.B.3 Sort and Count 1		

Unit 2 - 9 weeks **Counting, Addition & Subtraction**	● K.CC.A.1* ● K.CC.A.2 ● K.CC.A.3* ● K.OA.A.1* ● K.OA.A.2 ● K.CC.B.5* ● K.CC.C.6 ● K.CC.C.7	● Know number names and the count sequence to 50 ● Understand addition as putting together and adding to understand subtraction as taking apart and taking from ● Count to tell the number of objects ● Compare numbers	MP.5 Use appropriate tools strategically. MP.6 Attend to precision.

	● K.OA.A.5*		MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.
Unit 2: **Suggested Open Educational Resources**	K.CC.A.1 Choral Counting K.CC.A.2 Start-Stop Counting K.CC.A.3 Assessing Writing Numbers K.OA.A.2 Dice Addition 2 K.OA.A.2 What's Missing? K.CC.B.5 Finding Equal Groups K.CC.C.6 Which number is greater? Which number is less? How do you know? K.CC.C.7 Guess the Marbles in the Bag K.OA.A.5 Many Ways to Do Addition 1		

Unit 3 - 9 weeks **Place Value & Measurement**	● K.CC.A.1* ● K.MD.A.1 ● K.MD.A.2 ● K.MD.B.3* ● K.G.A.2 ● K.G.A.3 ● K.OA.A.3 ● K.OA.A.4 ● K.NBT.A.1* ● K.OA.A.5*	● Know number names and the count sequence to 70 ● Describe and compare measurable attributes ● Classify and count the number of objects in categories ● Identify and describe shapes ● Understand addition as putting together and adding to understand subtraction as taking apart and taking from ● Work with numbers 11-19 to gain foundations for place value	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.
Unit 3: **Suggested Open Educational Resources**	K.CC.A.1 Assessing Counting Sequences Part 1 K.MD.A.1 Which is heavier? K.MD.A.2 Which is Longer? K.MD.B.3 Sort and Count 2 K.OA.A.3 Shake and Spill K.OA.A.3 Pick Two K.NBT.A.1 What Makes a Teen Number K.OA.A.5 My Book of Five		
Unit 4 - 9 weeks **Place Value & Geometric Shapes**	● K.CC.A.1* ● K.OA.A.5* ● K.G.B.4 ● K.G.B.5 ● K.G.B.6 ● K.NBT.A.1*	● Know number names and the count sequence to 100 ● Fluently add and subtract within 5 ● Analyze, compare, create, and compose shapes ● Work with numbers 11-19 to gain foundations for place value	
Unit 4: **Suggested Open Educational Resources**	K.CC.A.1 Counting by Tens K.G.B.4 Alike or Different Game K.NBT.A.1 What Makes a Teen Number		

Kindergarten: Interdisciplinary Connections
____ Language Arts ____ Science ____ Social Studies ____ World Languages ____ Arts
21st Century Themes
___ Global Awareness ___ Financial, Economic, Business and Entrepreneurial Literacy ___ Civic Literacy ___ Health Literacy ___ Environmental Literacy

21st Century Life and Careers Standards

Career Ready Practices:

☒ 9.4.2.CI.1: Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2)

☒ 9.4.2.CI.2: Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a)

☐ 9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2)

☒ 9.4.2.CT.2: Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3

☒ 9.4.2.DC.3: Explain how to be safe online and follow safe practices when using the internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).

☐ 9.4.2.DC.6: Identify respectful and responsible ways to communicate in digital environments

☒ 9.4.2.TL.2: Create a document using a word processing application

☐ 9.4.2.TL.5: Describe the difference between real and virtual experiences

☐ 9.1.2.CAP.1: Make a list of different types of jobs and describe the skills associated with each job..

☐ 9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community

☐ 9.1.2.CR.2: List ways to give back, including making donations, volunteering, and starting a business.

Content Standards	Suggested Standards for Mathematical Practice and P21 Skill	Critical Knowledge & Skills
● K.CC.A.1. Count to 100 by ones and by tens. *(benchmarked)	MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Creativity and Innovation Communication and Information Literacy	Concept(s): ● Number names and the count sequence up to 10 Students are able to: ● count orally by ones up to 10. Learning Goal 1: Count by ones up to 10.
● 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). *(benchmarked)	MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure. Creativity and Innovation Critical Thinking and Problem Solving	Concept(s): ● Represent the number of objects with a numeral. Students are able to: ● write numbers from 0 to 10. Learning Goal 2: Represent the number of objects with a written numeral up to 10.
● K.CC.B.4. Understand the relationship between numbers and quantities; connect counting to cardinality. K.CC.B.4a.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	MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Creativity and Innovation Critical Thinking and Problem Solving Communication and Information Literacy	Concept(s): ● Objects can be counted in any order. Each object is counted once (one-to-one correspondence). ● The next number name in counting is always one greater than the previous number. ● The last number name said tells the number of objects counted. Students are able to: ● say number names in the standard order. ● pair each object with one number name (one-to-one correspondence). ● count to tell the number of objects.

object. K.CC.B.4b. 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.4c. Understand that each successive number name refers to a quantity that is one larger.		● count objects arranged in any order. ● identify the last number named as the number of objects counted. Learning Goal 3: Assign an ascending number name for each object in a group. Learning Goal 4: State the last number named as the number of counted objects in the set. Learning Goal 5: Identify the next number name in counting as one greater than the previous number.
● 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. *(benchmarked)	MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Creativity and Innovation Critical Thinking and Problem Solving Communication and Information Literacy	Concept(s): No new concept(s) introduced Students are able to: ● count to tell the number of objects arranged in a line, rectangular array, circle, or scattered configuration. ● count to tell the number of objects when asked *how many?* questions. ● given a number from 1-10, count out that many object. Learning Goal 6: Answer *how many?* questions about groups of <u>up to 10</u> objects when arranged in a line, rectangular array or circle. Learning Goal 7: Answer *how many?* questions about groups of <u>up to 5</u> when arranged in a scattered configuration.

● 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,	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.7 Look for and make use of structure.	Concept(s): ● Understand addition as putting together and adding to. ● Understand subtraction as taking apart and taking from. Students are able to: ● create addition events with objects (up to 10).

expressions, or equations. *(benchmarked)	MP.8 Look for and express regularity in repeated reasoning. Creativity and Innovation Critical Thinking and Problem Solving Communication and Information Literacy	● create addition events with drawings and sounds (up to 10). ● create addition events by acting out situations and with verbal explanations. Learning Goal 8: Create addition events with objects, fingers, drawings, sounds (e.g., claps), acting out situations and verbal explanations for sums up to 10.
● K.MD.B.3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count *(benchmarked)	MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure Critical Thinking and Innovation Creativity and Innovation	Concept(s): ● Objects can be sorted based on their properties. Students will be able to: ● sort objects into categories Learning Goal 9: Classify objects into given categories and count the objects in each category (up to 10 objects)

● 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 above, below, beside, in front of, and next to.	MP.7 Look for and make use of structure. Creativity and Innovation	Concept(s): ● Shapes have names. ● Positional words (above, below, besides, in front of, behind, next to) Students will be able to: ● name shapes in order to describe objects in the environment. ● use terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to* in order to describe relative positions of objects. Learning Goal 10: Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.

 Key:

Unit 1 Kindergarten Connecting Counting to Cardinality

School/District Formative Assessment Plan

Classwork

Exit tickets

White boards

Individual and group work

Math journals

Georgia Department of Education

https://www.georgiastandards.org/Georgia Standards/Frameworks/K-Math-Unit-3.pdf

Georgia Department of Education

https://www.georgiastandards.org/Georgia-Standards/Frameworks/K-Math-Unit-1.pdf

School/District Summative Assessment Plan Alternative Assessment Benchmark Assessment

Benchmarks

Chapter tests

Performance tasks

Extended projects

Teacher Created Assessments Performance Based Assessments Extension Projects

Renaissance/STAR

Map Testing

DRA

Benchmark Tests within EnVision/GoMath/Eureka Math/iReady

State Testing Results

Focus Mathematical Concepts- Connecting Counting and Cardinality

Prerequisite skills: Although many students have attended pre-school prior to entering kindergarten, this is the first year of school for many students. For that reason, no concepts/skills are listed as prerequisites. It is expected that teachers will differentiate to accommodate those students who may enter kindergarten with prior knowledge.

Common Misconceptions:

K.CC.3 addresses the writing of numbers and using the written numerals (0-20) to describe the amount of a set of objects. Recognize varied development of fine motor and visual development, a reversal of numerals will occur in a majority of the students. While reversals should be pointed out to students, the emphasis is on the use of numerals to represent quantities rather than the correct handwriting formation of the actual numeral itself.

Some students might see zero as a number. Ask students to write 0 and say *zero* to represent the number of items left when all items are taken away. Avoid using the word *none* to represent this situation.

Some students might think that the count word used to tag an item is permanently connected to that item. So, when the item is used again for counting and should be tagged with a different count word, the student uses the original count word. For example, a student counts four geometric figures: triangle, square, circle and rectangle with the count words: one, two, three, and four. If these items are rearranged as rectangle, triangle, circle and square and counted, the student says these count words: four, one, three, and two.

Errors in Counting: Four factors strongly affect accuracy in counting correspondence: 1. Amount of counting experiences (more experience leads to fewer errors) 2. Size of set (children become accurate on small sets first) 3. Arrangements of objects (objects in rows make it easier to keep track of what has been counted and what has not) 4. Effort

Number Fluency:K.OA.A.5. Demonstrate fluency for addition and subtraction within 5. (by the end of Kindergarten). *(benchmarked)

District/School Tasks District/School Primary and Supplementary Resources Framework for 21st Century Learning

Delaware comparison documents

http://www.doe.k12.de.us/cms/lib09/DE01922744/Centricity/Domain/111/Math_Grade_K.pdf

Georgia Department of Education

https://www.georgiastandards.org/Georgia-Standards/Frameworks/K-Math-Unit-1.pdf

https://www.georgiastandards.org/Georgia-Standards/Frameworks/K-Math-Unit-3.pdf

http://www.p21.org/our-work/p21-framework

NJDOE-21st Century Life and Careers

http://www.state.nj.us/education/aps/cccs/career/

Arizona flip book

http://www.katm.org/flipbooks/K%20FlipBook%20Final%20CCSS%202014.pdf

North Carolina wikispaces

http://maccss.ncdpi.wikispaces.net/Elementary

Georgia Department of Education Kindergarten

https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx

Engage NY

https://www.engageny.org/resource/kindergarten-mathematics-module-1

Technology Connection:

Five Frames: http://illuminations.nctm.org/ActivityDetail.aspx?ID=74 Students manipulate objects to fill and answer the question “how many” in a five frame.

Ten Frames: http://illuminations.nctm.org/ActivityDetail.aspx?ID=75 Students manipulate objects to fill and answer the question “how many” in a ten frame.

Number Frames: http://www.mathlearningcenter.org/web-apps/number-frames/ Students manipulate objects in five and ten frames to develop understanding of number relationships and quantity.

Learning centers

Trade books

Essential questions

How can numbers be represented?

How can we show numbers in different ways?

Why do we need to be able to count objects?

How do we use numbers every day?

How do we know if a number is more or less than another number?

Why would we need to be able to read number words?

What is a numeral?

Why do we need to be able to count forwards and backwards?

How can we use counting in our everyday lives?

Why is it important to know how to put things in number order?

What is the difference between “more” and “less”?

How can numbers be represented?

How can we describe shapes in our everyday lives?

Special Education Students English Language Learners Students at Risk of School Failure Gifted and Talented Students Students with 504 Plans

- Provide a checklist for long, detailed tasks
- Use concrete examples of concepts before teaching the abstract
- Highlight important concepts to be learned in text of material
- Provide concrete examples for homework/class work assignments
- Give additional presentations by varying the methods using repetition, simpler explanations and modeling

- Give written directions to supplement verbal directions
- Use enVision Spanish Resources
- Provide text to speech for math problems
- Use of translation dictionary or software
- Confer frequently
- Adapt a Strategy-Adjusting strategies for ESL students: http://www.teachersfirst.com/co n tent/esl/adaptstrat.cfm
- Familiarize student with new vocabulary before beginning lesson

- Utilize visual aids and graphic organizers
- Utilize manipulative, hands-on activities
- Tiered interventions following RTI framework
- RTI Intervention Bank
- NJDOE resources
- Utilize online resources such as www.tenmarks.com
- EnVision K-5 intervention supports
- Modify activities/assignments/projects/as sessments

- Provide an option for alternative activities/assignments/projects/as sessments
- Provide higher-order questioning and discussion opportunities
- Utilize exploratory connections to higher grade concepts
- Modify Content
- Adjust Pacing of Content
- Small Group Enrichment
- Individual Enrichment
- Higher-Level Text
- Provide whole group enrichment explorations
- Provide a checklist for long, detailed tasks

- Use concrete examples of concepts before teaching the abstract
- Highlight important concepts to be learned in text of material
- Provide concrete examples for homework/class work assignments
- Give additional presentations by varying the methods using repetition, simpler explanations and modeling
- Give written directions to supplement verbal directions

●Familiarizestudentwithnew vocabularybeforebeginning lesson ●Utilizevisualaidsandgraphic

organizers
- Utilizemanipulative,hands-on activities
- Providegraphpaperfor computation
- Additionaltimetocomplete activities/assignments/projects/assessments
- Modifyorprovideanoptionfor alternative activities/assignments/projects/assessments
- SmallGroup Instruction/Intervention/Remediation
- Individual Intervention/Remediation
- AdditionalSupportMaterials/ Onlineresources
- GuidedNotesorcopyofteacher notes
- Reviewprerequisiteskills
- AfterSchoolTutoring
- Chunk activities/assignments/projects/assessmentsintomanageableunits

- Allowstudenttoreceivereading textinvariousforms(written, verbal, audio) r on a lower reading level
- Allow student to make test corrections or retake assessment
- Adjust Pacing of Content
- See IEP for specific modifications

- AdditionalSupportMaterials/ Onlineresources
- GuidedNotesorcopyofteacher notes
- Reviewprerequisiteskills
- http://www.wida.us/standards/elp.aspx
- Teachcognitiveand methodologicalskills
- Usecenter,stations,orcontracts
- Organizeintegrated problem-solvingsimulations
- Proposeinterest-basedextension activities
- Createanenhancedsetof introductoryactivities(e.g. advance organizers, concept maps,conceptpuzzles
- Provideoptions,alternativesand choicestodifferentiateand broadenthecurriculum
- Proposeindependentprojects basedonindividualinterests
- AdditionalSupportMaterials/ Onlineresources
- Afterschoolclubs
- Tieredcenters
- Tieredassignments
- Familiarizestudentwithnew vocabularybeforebeginning lesson
- Utilizevisualaidsandgraphic organizers
- Utilizemanipulative,hands-on activities
- Providegraphpaperfor computation
- Additionaltimetocomplete activities/assignments/projects/assessments
- Modifyorprovideanoptionfor alternative activities/assignments/projects/assessments
- SmallGroup Instruction/Intervention/Remediation
- Individual Intervention/Remediation
- AdditionalSupportMaterials/ Onlineresources
- GuidedNotesorcopyofteacher notes
- Reviewprerequisiteskills
- AfterSchoolTutoring
- Chunk activities/assignments/projects/assessmentsintomanageableunits
- Allowstudenttoreceivereading textinvariousforms(written, verbal, audio) r on a lower reading level
- Allow student to make test corrections or retake assessment
- Adjust Pacing of Content
- See 504 plan for specific accommodations

Vocabulary Ongoing Modifications

Building the language of mathematics

http://maccss.ncdpi.wikispaces.net/file/view/2014+Building+Vocabulary.pdf

ELL

http://www.wida.us/standards/elp.aspx

NJ Model Curriculum:

https://www.state.nj.us/education/bilingual/curriculum/

Achieve the Core:

https://achievethecore.org/aligned/ccss-aligned-materials-for-ell-students/ Georgia

Department of Education: Kindergarten Intervention Tables

https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx

Engage NY

https://www.engageny.org/resource/kindergarten-mathematics-module-1 NC

Resources for k-2 Advanced Math Learners

http://ncaigirp.ncdpi.wikispaces.net/Mathematics+K-2

 Key:

Differentiated worksheets

Differentiated centers

Extra time on task

Limited # of items

Instructional Best Practices and Exemplars

When counting orally, students should recognize the patterns that exist from 1 to 100. They should also recognize the patterns that exist when counting by 10s. Have students verbalize the patterns they see. Help them see patterns, make connections and provide repeated experiences that give students time and opportunities to develop understandings and increase fluency.

Games that require students to add on to a previous count to reach a goal number encourage developing this concept. Frequent and brief opportunities utilizing counting on and counting back are recommended. These concepts emerge over time and cannot be forced. Like counting to 100 by either ones or tens, writing numbers from 0 to 20 is a rote process.

Initially, students mimic the actual formation of the written numerals while also assigning it a name. Over time, children create the understanding that number symbols signify the meaning of counting. Practice count words and written numerals paired with pictures, representations of objects, and objects that represent quantities within the context of life experiences for kindergarteners. For example, dot cards, dominoes and number cubes all create different mental images for relating quantity to number words and numerals. One way students can learn the left to right orientation of numbers is to use a finger to write numbers in air (sky writing).

Children will see mathematics as something that is alive and that they are involved. As with many physical activities, counting will improve with practice and does not need to be perfect

each time. It is much more important for all children to get frequent counting practice and watch and help one another, with occasional help and correction form the teacher.

Activities that utilize anchors of 5 and 10 are helpful in securing understanding of the relationships between numbers. (Five-Frame and Ten Frame) This flexibility with numbers will greatly impact children's ability to break numbers into parts. Students need to explain their reasoning when they determine whether a number is greater than, less than, or equal to another number. Teachers need to ask probing questions such as "How do you know?" to elicit their thinking. For students, these comparisons increase in difficulty, from greater than to less than to equal. It is easier for students to identify differences than to find similarities.

 Key:
Strategies:

· Matching: Students use one-to-one correspondence, repeatedly matching one object from one set with one object from the other set to determine which set has more objects. · Counting: Students count the objects in each set, and then identify which set has more, less, or an equal number of objects.

· Observation: Students may use observation to compare two quantities (e.g., by looking at two sets of objects, they may be able to tell which set has more or less without counting). · Observations in comparing two quantities can be accomplished through daily routines of collecting and organizing data in displays. Students create object graphs and pictographs using data relevant to their lives (e.g., favorite ice cream, eye color, pets, etc.). Graphs may be constructed by groups of students as well as by individual students.

· Benchmark Numbers: This would be the appropriate time to introduce the use of 0, 5 and 10 as benchmark numbers to help students further develop their sense of quantity as well as their ability to compare numbers.

Interdisciplinary Connections Technology Integration

- Language Arts - Vocabulary: students will connect everyday vocabulary to strengthen their understanding of mathematical terms
- Language Arts - Reading Strategies: students will utilize reading comprehension skills by acting out or drawing the order of important events in a story problem. Reading and writing stories to represent addition and subtraction
- Language Arts - Writing Strategies: students will create mathematical stories using numbers, pictures and words.
- Language Arts - Interactive Student Notebook
- Language Arts - Read Alouds
- Science: work with data/make calculations involving measurements and other data across all modules
- Social Studies - Economics- connecting money as a means for helping people buy things they need or want; complete independent/partner projects to plan and market a good or service
  - **8.1.2.A.1** Identify the basic features of a digital device and explain its purpose.
  - **8.1.2.E.1** Use digital tools and online resources to explore a problem or issue.
  - **8.2.2.C.1** Brainstorm ideas on how to solve a problem or build a product.

Kindergarten: Interdisciplinary Connections **____ Language Arts ____ Science ____ Social Studies ____ World Languages ____ Arts**
21st Century Themes **___ Global Awareness ___ Financial, Economic, Business and Entrepreneurial Literacy ___ Civic Literacy ___ Health Literacy ___ Environmental Literacy**

21st Century Life and Careers Standards

Career Ready Practices:

☒ 9.4.2.CI.1: Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2)

☒ 9.4.2.CI.2: Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a)

☐ 9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2)

☒ 9.4.2.CT.2: Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3

☒ 9.4.2.DC.3: Explain how to be safe online and follow safe practices when using the internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).

☐ 9.4.2.DC.6: Identify respectful and responsible ways to communicate in digital environments

☒ 9.4.2.TL.2: Create a document using a word processing application

☐ 9.4.2.TL.5: Describe the difference between real and virtual experiences

☐ 9.1.2.CAP.1: Make a list of different types of jobs and describe the skills associated with each job..

☐ 9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community

☐ 9.1.2.CR.2: List ways to give back, including making donations, volunteering, and starting a business.

Unit 2 Kindergarten- Counting, Addition and Subtraction

Content Standards	Suggested Mathematical Practices and P21 Skill	Critical Knowledge & Skills
● K.CC.A.1. Count to 100 by ones and by tens. *(benchmarked)	MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Creativity and Innovation Communication and Information Literacy Critical Thinking and Problem Solving	Concept(s): ● Number names and the count sequence up to 50 Students are able to: ● count orally by ones up to 50. ● count orally by tens up to 50. Learning Goal 1: Count to 50 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).		Concept(s): No new concept(s) introduced Students will be able to: ● count orally by ones up to 50, beginning at any number. Learning Goal 2: ● Count forward up to 50 starting from numbers other than one.
● 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). *(benchmarked)	MP. 2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure. Creativity and Innovation Critical Thinking and Problem Solving	Concept(s): ● The number of objects can be represented by a numeral. Students are able to: ● write numbers from 0 to 20. Learning Goal 3: Represent a number of objects with a written numeral 0 to 20.

● 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. *(benchmarked)	MP.1 Make sense of problems and persevere in solving them. MP. 2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Information Literacy	Concept(s): ● Understand addition as putting together and adding to. ● Understand subtraction as taking apart and taking from. Students are able to: ● create subtraction and addition events with objects (up to 10). ● create subtraction and addition events with drawings and sounds (up to 10). ● create subtraction and addition events by acting out situations and with verbal explanations. Learning Goal 4: Create addition and subtraction events with objects, fingers, drawings, sounds (e.g., claps), acting out situations and verbal explanations (up to 10).
● K.OA.A.2. Solve addition and subtraction word problems, and add and subtract within 10, *e.g., by using objects or drawings to represent the problem.*	MP.1 Make sense of problems and persevere in solving them. MP. 2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. Creativity and Innovation Critical Thinking and Problem Solving ICT Literacy	Concept(s): No new concept(s) introduced Students will be able to: ● use objects and drawings to represent addition and subtraction. ● add and subtract within 10. Learning Goal 5: Use objects or drawings to represent and solve addition and subtraction word problems (within 10).

● 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	MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): No new concept(s) introduced Students are able to: ● count to tell the number of objects arranged in a line, rectangular array, circle, or scattered configuration. ● count to tell the number of objects when asked “how many?” questions. ● given a number from 1-20, count out that many object.

from 1-20, count out that many objects. *(benchmarked)	Critical Thinking and Problem Solving Creativity and Innovation Information Literacy	Learning Goal 6: Answer *how many?* questions about groups of <u>up to 20</u> objects when arranged in a line, rectangular array or circle. Learning Goal 7: Answer *how many?* questions about groups of <u>up to 10</u> when arranged in a scattered configuration.
● 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.*	MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Critical Thinking and Problem Solving Creativity and Innovation Information Literacy	Concept(s): ● Different groups can have different numbers of objects. ● Numbers of objects can be compared using phrases such as *greater than*, *less than* and *equal to.* Students will be able to: ● compare the number of objects (up to 10) in two groups. ● identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group. Learning Goal 8: Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group (groups of up to 10 objects).

● K.CC.C.7. Compare two numbers between 1 and 10 presented as written numerals.	MP.2 Reason abstractly and quantitatively. Creativity and innovation	Concept(s): ● Number names and the count sequence ● The next number name in counting is always one greater than the previous number. ● Count to tell the number of objects. Students will be able to: ● compare numbers (up to 10) written as numerals. Learning Goal 9: Compare numbers (up to 10) written as numerals.

● K.OA.A.5. Demonstrate fluency for addition and subtraction within 5. (by the end of Kindergarten). *(benchmarked)	MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Communication and Information Literacy Creativity and Innovation	Concept(s): No new concept(s) introduced Students will be able to: ● add within 5 with accuracy and efficiency. Learning Goal 10: Use mental math strategies to solve addition facts within 5.

Unit 2 Kindergarten Counting, Addition and Subtraction

School/District Formative Assessment Plan School/District Summative Assessment Plan

Classwork

Exit tickets

White boards

Individual and group work

Math journals

Delaware comparison documents

http://www.doe.k12.de.us/cms/lib09/DE01922744/Centricity/Domain/111/Math_Grade_K.pdf

Benchmarks

Chapter tests

Performance tasks

Extended projects	Georgia Department of Education https://www.georgiastandards.org/Georgia-Standards/Frameworks/K-Math-Unit-2.pdf

Alternative Assessment Benchmark Assessment

Teacher Created Assessments Performance Based Assessments Extension	Benchmark Tests within EnVision/GoMath/Eureka Math/iReady State Testing
Projects	Results
Renaissance/STAR	
Map Testing	
DRA	

 Key:

Focus Mathematical Concepts- Counting, Addition and Subtraction

Prerequisites: Although many students have attended pre-school prior to entering kindergarten, this is the first year of school for many students. For that reason, no concepts/skills are listed as prerequisites. It is expected that teachers will differentiate to accommodate those students who may enter kindergarten with prior knowledge

Common Misconceptions:

Counting on or counting from a given number conflicts with the learned strategy of counting from the beginning. In order to be successful in counting on, students must understand cardinality (the number that ends the counting sequence represents how many objects are in the collection). Students often merge or separate two groups of objects and then re-count from the beginning to determine the final number of objects represented. For these students, counting is still a rote skill or the benefits of counting on have not been realized. Games that require students to add on to a previous count to reach a goal number encourage developing this concept. Frequent and brief opportunities utilizing counting on and counting back are recommended. These concepts emerge over time and cannot be forced.

Students may over-generalize the vocabulary in word problems and think that certain words indicate solution strategies that must be used to find an answer. They might think that the word more always means to add and the words take away or left always means to subtract. When students use the words take away to refer to subtraction and its symbol, teachers need to repeat students' ideas using the words minus, subtract, or find the difference between. For example, students use addition to solve this Take From/Start Unknown problem: Seth took the 8 stickers he no longer wanted and gave them to Anna. Now Seth has 11 stickers left. How many stickers did Seth have to begin with?

Some students might not see zero as a number. Ask students to write 0 and say zero to represent the number of items left when all items have been taken away. Avoid using the word none to represent this situation. Some students might think that the count word used to tag an item is permanently connected to that item. So when the item is used again for counting and should be tagged with a different count word, the student uses the original count word. For example, a student counts four geometric figures: triangle, square, circle and rectangle with the count words: one, two, three, four. If these items are rearranged as rectangle, triangle, circle and square and counted, the student says these count words: four, one, three, two.

If students' progress from working with manipulatives to writing numerical expressions and equations, they skip using pictorial thinking. Students will then be more likely to use finger

counting and rote memorization for work with addition and subtraction. Counting forward builds to the concept of addition while counting back leads to the concept of subtraction. However, counting is an inefficient strategy. Provide instructional experiences so that students' progress from the concrete level to the pictorial level to the abstract level. Students have difficulty with ten as a singular word that means 10 things. For many students, the idea that a group of 10 things can be replaced by a single object and both objects represent 10 is confusing. Help students develop the sense of 10 by first using groupable materials then replacing the group with an object or representing 10. Watch for and address the issue of attaching words to materials and groups without knowing what they represent. If this misconception is not addressed early on it can cause additional issues when working with numbers 11-19 and beyond.

Number Fluency: K.OA.A.5. Demonstrate fluency for addition and subtraction within 5. (by the end of Kindergarten). *(benchmarked) **District/School**

Tasks District/School Primary and Supplementary Resources

Delaware comparison documents

http://www.doe.k12.de.us/cms/lib09/DE01922744/Centricity/Domain/111/Math_Grade_K.pdf

Georgia Department of Education

https://www.georgiastandards.org/Georgia-Standards/Frameworks/K-Math-Unit-2.p df

Framework for 21st Century Learning

http://www.p21.org/our-work/p21-framework

NJDOE-21st Century Life and Careers

http://www.state.nj.us/education/aps/cccs/career/

Arizona flip book
http://www.katm.org/flipbooks/K%20FlipBook%20Final%20CCSS%202014.pdf

North Carolina wikispaces

http://maccss.ncdpi.wikispaces.net/Elementary

Georgia Department of Education Kindergarten
https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx

Engage NY
https://www.engageny.org/resource/kindergarten-mathematics-module-1

Technology Connection:

Five Frames: http://illuminations.nctm.org/ActivityDetail.aspx?ID=74 Students manipulate objects to fill and answer the question "how many" in a five frame.

Ten Frames: http://illuminations.nctm.org/ActivityDetail.aspx?ID=75 Students manipulate objects to fill and answer the question "how many" in a ten frame.

Number Frames: http://www.mathlearningcenter.org/web-apps/number-frames/ Students manipulate objects in five and ten frames to develop understanding of number relationships and quantity.

Manipulatives: # cards, counters, numbers line, etc.

Learning centers

Trade books

Essential questions

What is the difference between a group of ten and the leftovers?

Why is counting important?

How can you know a quantity without counting each object?

How can numbers be represented?

How do you know how many objects you have?

How do you know if you have more or less than your partner?

How might you recognize the number of dots on a card without counting?

How can you explain how one end of a domino connects to another?

When do we use counting skills in everyday life?

What is an efficient strategy for counting teen numbers?

How can you know a quantity without counting each object?

How do we use counting in our everyday lives?

What is an efficient way to count an amount greater than ten?

Why do I need to be able to count objects?

How do I use numbers every day?

 Key:

Special Education Students	English Language Learners	Students at Risk of School Failure	Gifted and Talented Students	Students with 504 Plans
● Provide a checklist for long, detailed tasks	● Use concrete examples of concepts before teaching the abstract	● Highlight important concepts to be learned in text of material ● Provide concrete examples for	homework/class work assignments ● Give additional presentations by	varying the methods using repetition, simpler explanations and modeling

● Give written directions to supplement verbal directions ● Familiarize student with new vocabulary before beginning lesson
● Utilize visual aids and graphic organizers
● Utilize manipulative, hands-on activities
● Provide graph paper for computation
● Additional time to complete activities/assignments/projects/assessments
● Modify or provide an option for alternative
● Use enVision Spanish Resources ● Provide text to speech for math problems
● Use of translation dictionary or software
● Confer frequently

● Adapt a Strategy-Adjusting strategies for ESL students: http://www.teachersfirst.com/content/esl/adaptstrat.cfm
● Familiarize student with new vocabulary before beginning lesson
● Utilize visual aids and graphic organizers
● Utilize manipulative, hands-on activities
● Additional Support Materials/ Online resources
● Guided Notes or copy of teacher notes
● Review prerequisite skills ● http://www.wida.us/standards/elp.aspx
● Tiered interventions following RTI framework
● RTI Intervention Bank ● NJDOE resources
● Utilize online resources such as www.tenmarks.com
● EnVision K-5 intervention supports
● Modify activities/assignments/projects/assessments
● Provide an option for alternative activities/assignments/projects/assessments
● Provide higher-order questioning and discussion opportunities ● Utilize exploratory connections to higher grade concepts
● Modify Content
● Adjust Pacing of Content ● Small Group Enrichment ● Individual Enrichment
● Higher-Level Text
● Provide whole group enrichment explorations
● Teach cognitive and methodological skills
● Use center, stations, or contracts ● Organize integrated problem-solving simulations ● Propose interest-based extension activities
● Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles
● Provide a checklist for long, detailed tasks
● Use concrete examples of concepts before teaching the abstract
● Highlight important concepts to be learned in text of material ● Provide concrete examples for homework/class work assignments
● Give additional presentations by varying the methods using repetition, simpler explanations and modeling
● Give written directions to supplement verbal directions ● Familiarize student with new vocabulary before beginning lesson
● Utilize visual aids and graphic organizers
● Utilize manipulative, hands-on activities
● Provide graph paper for computation
● Additional time to complete activities/assignments/projects/assessments
● Modify or provide an option for alternative

 Key:

activities/assignments/projects/assessments
● Small Group Instruction/Intervention/Remediation
● Individual Intervention/Remediation
● Additional Support Materials/ Online resources
● Guided Notes or copy of teacher notes
● Review prerequisite skills
● After School Tutoring
● Chunk activities/assignments/projects/assessments into manageable units
● Allow student to receive reading text in various forms (written, verbal, audio) r on a lower reading level
● Allow student to make test corrections or retake assessment
● Adjust Pacing of Content
● See IEPs of students for specific modifications

Vocabulary Ongoing Modifications
● Provide options, alternatives and choices to differentiate and broaden the curriculum
● Propose independent projects based on individual interests ● Additional Support Materials/ Online resources
● After school clubs
● Tiered centers
● Tiered assignments activities/assignments/projects/assessments
● Small Group Instruction/Intervention/Remediation
● Individual Intervention/Remediation
● Additional Support Materials/ Online resources
● Guided Notes or copy of teacher notes
● Review prerequisite skills ● After School Tutoring

● Chunk activities/assignments/projects/assessments into manageable units ● Allow student to receive reading text in various forms (written, verbal, audio) r on a lower reading level ● Allow student to make test corrections or retake assessment ● Adjust Pacing of Content ● See 504 plan for specific accommodations

Building the language of mathematics Georgia Department of Education Kindergarten Intervention Tables

 Key:
http://maccss.ncdpi.wikispaces.net/file/view/2014+Building+Vocabulary.pdf https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx Engage NY

https://www.engageny.org/resource/kindergarten-mathematics-module-1

NC Resources for k-2 Advanced Math Learners

ELL:

http://www.wida.us/standards/elp.aspx

NJ Model Curriculum:

https://www.state.nj.us/education/bilingual/curriculum/

Achieve the Core:

https://achievethecore.org/aligned/ccss-aligned-materials-for-ell-students/

Differentiated worksheets

Differentiated centers

Extra time on task

Limited # of items

Instructional Best Practices and Exemplars

Kindergarten students should see addition and subtraction equations. Student writing of equations in kindergarten is encouraged, but it is not required. Students choose, combine, and apply effective strategies for answering quantitative questions, including quickly recognizing the cardinalities of small sets of objects, counting and producing sets of given sizes, counting the number of objects in combined sets, or counting the number of objects that remain in a set after some are taken away.

Counting forward builds to the concept of addition while counting back leads to the concept of subtraction. However, counting is an inefficient strategy. Teachers need to provide instructional experiences so that students' progress from the concrete level, to the pictorial level, then to the abstract level when learning mathematical concepts. (Concrete, Pictorial, Abstract CPA) Just knowing the basic facts is not enough. We need to help students develop the ability to quickly and accurately understand the relationships between numbers. They need to make sense of numbers as they find and make strategies for joining and separating quantities. (Table 1 in Appendix)

After the students are familiar with counting up to 19 objects by ones, have them explore different ways to group the objects that will make counting easier. Have them estimate before they count and group. Discuss their groupings and lead students to conclude that grouping by ten is desirable. "10 ones make 1 ten" makes students wonder how something that means a lot of things can be one thing. They do not see that there are 10 single objects represented on the item for ten in pre-grouped materials, such as the rod in base-ten blocks.

Students then attach words to materials and groups without knowing what they represent. Eventually they need to see the rod as a ten that they did not group themselves. Students need to first use materials that can be grouped to represent numbers 11 to 19 because a group of ten such as a bundle of 10 straws or a cup of 10 beans makes more sense than a ten in pre-grouped materials.

Kindergarteners should use proportional base-ten models, where a group of ten is physically 10 times greater than the model for a one. Non-proportional models such as an abacus and money should not be used at this grade level if students have a tenuous understanding of models for ten. Proceed with caution with coin-based activities. Wait, if necessary, and revisit later in the year.

Students should impose their base-ten concepts on a model made from grouped and pre-grouped materials (see resources/tools). Students can transition from grouped to pre-grouped materials by leaving a group of ten intact to be reused as a pre-grouped item. When using pre-grouped materials, students should reflect on the ten-to-one relationships in the materials, such as the "ten-ness" of the rod in base-ten blocks. After many experiences with pre-grouped materials, students can use dots and a stick (one tally mark) to record singles and a ten, and then move to experiences with pennies and dimes.

Interdisciplinary Connections Technology Integration

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- Language Arts - Reading Strategies: students will utilize reading comprehension skills by acting out or drawing the order of important events in a story problem. Reading and writing stories to represent addition and subtraction
- Language Arts - Writing Strategies: students will create
  - **8.1.2.A.1** Identify the basic features of a digital device and explain its purpose.
  - **8.1.2.E.1** Use digital tools and online resources to explore a problem or issue.
  - **8.2.2.C.1** Brainstorm ideas on how to solve a problem or build a product.

mathematical stories using numbers, pictures and words.

- Language Arts - Interactive Student Notebook
- Language Arts - Read Alouds
- Science: work with data/make calculations involving measurements and other data across all modules
- Social Studies - Economics- connecting money as a means for helping people buy things they need or want; complete independent/partner projects to plan and market a good or service

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21st Century Themes
___ Global Awareness ___ Financial, Economic, Business and Entrepreneurial Literacy ___ Civic Literacy ___ Health Literacy ___ Environmental Literacy

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☒ 9.4.2.CI.2: Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a)

☐ 9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2)

☒ 9.4.2.CT.2: Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3

☒ 9.4.2.DC.3: Explain how to be safe online and follow safe practices when using the internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).

☐ 9.4.2.DC.6: Identify respectful and responsible ways to communicate in digital environments

☒ 9.4.2.TL.2: Create a document using a word processing application

☐ 9.4.2.TL.5: Describe the difference between real and virtual experiences

☐ 9.1.2.CAP.1: Make a list of different types of jobs and describe the skills associated with each job..

☐ 9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community

☐ 9.1.2.CR.2: List ways to give back, including making donations, volunteering, and starting a business.

Unit 3 Kindergarten- Place Value and Measurement		
Content Suggested Math Practices and P21 Skills		**Critical Knowledge & Skills**
● K.CC.A.1. Count to 100 by ones and by tens. *(benchmarked)	MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Creativity and Innovation Communication and Information Literacy	Concept(s): ● Number names and the count sequence up to 70 Students are able to: ● count orally by ones up to 70. ● count orally by tens up to 70. Learning Goal 1: Count to 70 by ones and by tens.
● K.MD.A.1. Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.	MP.7 Look for and make use of structure. Creativity and Innovation	Concept(s): ● Measurable attributes: length, weight, size (volume) ● A single object can have more than one measurable attribute. Students are able to: ● identify measurable attributes.

		● describe the measurable attributes of multiple objects. ● describe multiple measurable attributes of a single object. Learning Goal 2: Describe measurable attributes of multiple objects and describe several measurable attributes of a single object.
● 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 differences. *r example, directly compare the heights of two children and describe one child as taller/shorter*.	MP.6 Attend to precision. MP.7 Look for and make use of structure. Creativity and Innovation Communication and Collaboration	Concept(s): ● When comparing objects by measuring, each object must have the same starting point. ● Moving an object does not change its measure. Students are able to: ● directly compare and describe two objects with measurable attribute in common using *more of* or *less of*. Learning Goal 3*:* Directly compare two objects with a measurable attribute in common*;* use *more of* or *less of* to compare the objects.
● K.MD.B.3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. *(benchmarked)	MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure. Creativity and Innovation Critical Thinking and Problem Solving	Concept(s): ● Groups can be sorted by the number of objects in each group. Students are able to: ● sort objects into groups. ● sort the group by count. Learning Goal 4: Count the objects in given categories and sort the categories by count (up to 10 objects).

● K.G.A.2. Correctly name shapes regardless of their orientation or overall size.	MP.7 Look for and make use of structure. Creativity and Innovation	Concept(s): ● Shapes have names. ● Shapes can have the same names but appear different. Students are able to:

	Critical Thinking and Problem Solving	● correctly names shapes regardless of their orientation or overall size. Learning Goal 5: Correctly names shapes regardless of their orientation or overall size.
● K.G.A.3. Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”)	MP.7 Look for and make use of structure. Critical Thinking and Problem Solving Creativity and Innovation	Concept(s): ● Shapes may be *flat* or *solid.* Students are able to: ● identify shapes as two-dimensional (lying in a plane, *flat*) or three-dimensional (not *flat, solid*). ● compare two- and three- dimensional shapes, in different sizes, and orientations. Learning Goal 6: Identify shapes as two-dimensional (lying in a plane, *flat*) or three-dimensional (*not flat, solid*).

● K.OA.A.3. Decompose numbers less than or equal to 10 into pairs in more than one way, e.g. *using objects or drawings*, and record each decomposition by a drawing or equation *(e.g. 5 = 3 + 2 and 5 = 4 + 1)*	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Critical Thinking and Problem Solving Creativity and Innovation Communication and Information Literacy	Concept(s): ● Part-to-whole relationships ● Some groups of objects can be broken into two smaller groups while the total number remains the same. ● Some groups of objects can be broken into two smaller groups in more than one way. Students will be able to: ● decompose numbers less than or equal to ten into two numbers. ● record the decomposition with a drawing. ● record the decomposition with an equation. ● decompose the same number in more than one way. Learning Goal 7: Decompose numbers less than or equal to ten into pairs of numbers in more than one way and record with a drawing or equation.

● 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.	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Critical Thinking and Problem Solving Creativity and Innovation Communication and Information Literacy	Concept(s): No new concept(s) introduced Students are able to: ● find a missing part of 10 using objects. ● given a number from 1 to 9, use drawings, or equations to find the number that makes 10. Learning Goal 8*:* Given a number less than 10, find the number that makes 10.
● K.NBT. A.1. Compose and decompose numbers from 11 to 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	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Critical Thinking and Problem Solving	Concept(s): ● Numbers from 11 to 19 can be represented as one group of ten *ones* and another group containing fewer than ten *ones.* Students are able to: ● compose and decompose numbers from 11 to 19 into a group of ten *ones* and another group of one(s). ● use the term *ones* to describe the number of objects in each group. ● record each composition or decomposition using objects and drawings. ● record each composition or decomposition by a drawing or equation. Learning Goal 9*:* Compose and decompose numbers from 11 to 19 into a group of ten and one(s) with or without manipulatives*;* record each composition or decomposition through a drawing or equation.

ones.		

*(benchmarked)	Creativity and Innovation Communication and Information Literacy	

● K.OA.A.5. Demonstrate fluency for addition and subtraction within 5 (by the end of Kindergarten). *(benchmarked)	MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Critical Thinking and Problem Solving Creativity and Innovation Communication and Information Literacy	Concept(s): No new concept(s) introduced Students will be able to: ● add and subtract within 5 with accuracy and efficiency. Learning Goal 10: Use mental math strategies to solve addition and subtraction facts within 5.

Unit 3 Kindergarten - Place Value and Measurement

School/District Formative Assessment Plan School/District Summative Assessment Plan

Georgia Department of Education

https://www.georgiastandards.org/Georgia-Standards/Frameworks/K-Math-Unit-4.p df

Classwork

Exit tickets

White boards

Individual and group work

Math journals

Georgia Department of Education

https://www.georgiastandards.org/Georgia-Standards/Frameworks/K-Math-Unit-4.pdf

Benchmarks

Chapter tests

Performance tasks

Extended projects

Benchmark Assessment Alternative Assessment

Results

Teacher Created Assessments Performance Based Assessments Extension

Projects

Renaissance/STAR

Map Testing

DRA

Benchmark Tests within EnVision/GoMath/Eureka Math/iReady State Testing

Focus Mathematical Concepts

Prerequisite skills:
Although many students have attended pre-school prior to entering kindergarten, this is the first year of school for many students. For that reason, no concepts/skills are listed as prerequisites. It is expected that teachers will differentiate to accommodate those students who may enter kindergarten with prior knowledge.

Common Misconceptions:

Students often use incorrect terminology when describing shapes. For example, students may say a cube is a square or that a sphere is a circle. Another common misconception is separating a square from the identified category. Students often use incorrect terminology when describing shapes. For example, students may say a cube is a square or that a sphere is a circle. The use of two-dimensional shape names that appear to be part of a three-dimensional shape in order to name the three-dimensional shape is a common mistake. For example, students might call a cube a square because the student sees the face of the cube. Work with student to help them understand that the two-dimensional shape is a part of the object, but it has a different name.

Another common misconception is separating a square from the identified category of rectangles. A square exhibits the same characteristics of rectangles; however, it is special rectangle because it sides are equal in length. Students often mistake a change in size or orientation of a shape as a change in the name of the shape. One of the most common misconceptions in geometry is the belief that orientations are tied to shape. A student may see the second of the figures below as a triangle, but claim to not know the name of the first. Students need to have many experiences with shapes in different orientations. For example, ask students to form other triangles with the two triangles in different orientations.

Number Fluency: K.OA.A.5. Demonstrate fluency for addition and subtraction within 5. (by the end of Kindergarten). *(benchmarked) **District/School Tasks**

District/School Primary and Supplementary Resources

Delaware comparison documents

http://www.doe.k12.de.us/cms/lib09/DE01922744/Centricity/Domain/111/Math_Grade_K.pdf

framework NJDOE-21st Century Life and Careers

http://www.state.nj.us/education/aps/cccs/career/ Arizona flip book

Georgia Department of Education
Framework for 21st Century Learning http://www.p21.org/our-work/p21-

https://www.georgiastandards.org/Georgia-Standards/Frameworks/K-Math-Unit-4.pdf

Learning Progression
http://commoncoretools.files.wordpress.com/2012/07/ccss_progression_gm_k5_2012_07_21.pdf

http://gadoe.georgiastandards.org/mathframework.aspx?PageReq=MathBelinda

Essential questions

How do we show how many?

What do numbers tell me?

http://www.katm.org/flipbooks/K%20FlipBook%20Final%20CCSS%202014.pdf

North Carolina wikispaces

http://maccss.ncdpi.wikispaces.net/Elementary

Georgia Department of Education Kindergarten

https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx

Engage NY

https://www.engageny.org/resource/kindergarten-mathematics-module-1

TECHNOLOGY CONNECTION :

Patch Tool http://illuminations.nctm.org/ActivityDetail.aspx?ID=27 Students use pattern blocks to create pictures or combine shapes to make new shapes.

Cat in the Hat-The Great Shape Race
http://pbskids.org/catinthehat/games/great-shape-race.html Students collect shapes based on orientation and use those shapes to build irregular figures.

Manipulatives: # cards, counters, etc.

Learning centers

Trade books

 Key:

How can I show numbers beyond 10?

How can I compare 2 objects by their size?

Does how I measure matter?

How can I organize my information?

What does it mean to measure something?

Does how I measure matter?

What ways can I measure an object?

How can I compare two objects by their size?

What attributes of an object can be measured?

How can I compare 2 objects by their weight?

What categories can I create to identify the different attributes of objects?

Is there more than one way to sort objects?

Special Education Students	English Language Learners	Students at Risk of School Failure	Gifted and Talented Students	Students with 504 Plans
● Provide a checklist for long, detailed tasks ● Use concrete examples of concepts before teaching the abstract	● Use enVision Spanish Resources ● Provide text to speech for math problems ● Use of translation dictionary or software	● Tiered interventions following RTI framework ● RTI Intervention Bank ● NJDOE resources	● Modify activities/assignments/projects/as sessments ● Provide a checklist for long, detailed tasks	● Use concrete examples of concepts before teaching the abstract

Key:

● Highlight important concepts to be learned in text of material ● Provide concrete examples for homework/class work assignments ● Give additional presentations by varying the methods using repetition, simpler explanations and modeling ● Give written directions to supplement verbal directions ● Familiarize student with new vocabulary before beginning lesson ● Utilize visual aids and graphic organizers ● Utilize manipulative, hands-on activities ● Provide graph paper for computation	● Additional time to complete activities/assignments/projects/as sessments ● Modify or provide an option for alternative activities/assignments/projects/as sessments ● Small Group Instruction/Intervention/Remedia tion ● Individual Intervention/Remediation ● Confer frequently ● Adapt a Strategy-Adjusting strategies for ESL students: http://www.teachersfirst.com/con tent/esl/adaptstrat.cfm ● Familiarize student with new vocabulary before beginning lesson ● Utilize visual aids and graphic organizers ● Utilize manipulative, hands-on activities ● Additional Support Materials/ Online resources ● Guided Notes or copy of teacher notes ● Review prerequisite skills ● http://www.wida.us/standards/elp .aspx ● Utilize online resources such as www.tenmarks.com ● EnVision K-5 intervention supports ● Provide an option for alternative activities/assignments/projects/as sessments ● Provide higher-order questioning and discussion opportunities ● Utilize exploratory connections to higher grade concepts ● Modify Content ● Adjust Pacing of Content ● Small Group Enrichment ● Individual Enrichment ● Higher-Level Text ● Provide whole group enrichment explorations ● Teach cognitive and methodological skills ● Use center, stations, or contracts ● Organize integrated problem-solving simulations ● Propose interest-based extension activities ● Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles ● Provide options, alternatives and choices to differentiate and broaden the curriculum ● Propose independent projects based on individual interests ● Additional Support Materials/ Online resources ● After school clubs ● Highlight important concepts to be learned in text of material ● Provide concrete examples for homework/class work assignments ● Give additional presentations by varying the methods using repetition, simpler explanations and modeling			

● Give written directions to supplement verbal directions ● Familiarize student with new vocabulary before beginning lesson
● Utilize visual aids and graphic organizers
● Utilize manipulative, hands-on activities
● Provide graph paper for computation
● Additional time to complete activities/assignments/projects/assessments
● Modify or provide an option for alternative activities/assignments/projects/assessments
● Small Group Instruction/Intervention/Remediation
● Individual Intervention/Remediation

 Key:

● Additional Support Materials/ Online resources
● Guided Notes or copy of teacher notes
● Review prerequisite skills ● After School Tutoring
● Chunk activities/assignments/projects/as sessments into manageable units ● Allow student to receive reading text in various forms (written, verbal, audio) r on a lower reading level
● Allow student to make test corrections or retake assessment ● Adjust Pacing of Content ● See IEPs of students for specific modifications
● Tiered centers ● Tiered assignments
● Additional Support Materials/ Online resources
● Guided Notes or copy of teacher notes
● Review prerequisite skills ● After School Tutoring
● Chunk activities/assignments/projects/as sessments into manageable units ● Allow student to receive reading text in various forms (written, verbal, audio) r on a lower reading level
● Allow student to make test corrections or retake assessment ● Adjust Pacing of Content ● See 504 plan for specific accommodations

 Key:

Vocabulary Ongoing Modifications

Building the language of mathematics

http://maccss.ncdpi.wikispaces.net/file/view/2014+Building+Vocabulary.pdf

Georgia Department of Education Kindergarten Intervention Table

https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx

Engage NY

https://www.engageny.org/resource/kindergarten-mathematics-module-1 NC

Resources for k-2 Advanced Math Learners

http://ncaigirp.ncdpi.wikispaces.net/Mathematics+K-2

Differentiated worksheets

Differentiated centers

Extra time on task

Limited # of items

ELL:

http://www.wida.us/standards/elp.aspx

NJ Model Curriculum:

https://www.state.nj.us/education/bilingual/curriculum/

Achieve the Core:

https://achievethecore.org/aligned/ccss-aligned-materials-for-ell-students/

 Key:

Instructional Best Practices and Exemplars

It is critical for students to be able to identify and describe measurable attributes of objects. An object has different attributes that can be measured, like the height and weight of a can of food. Students should be given many opportunities to compare directly where the attribute becomes the focus. For example, when comparing the volume of two different boxes, ask students to discuss and justify their answers to these questions: Which box will hold the most? Which box will hold least? Will they hold the same amount? "How could you find out?" Students can decide to fill one box with dried beans then pour the beans into the other box to determine the answers to these questions. Have students work in pairs to compare their arm spans. As they stand back-to-back with outstretched arms, compare the lengths of their spans, then determine who has the shortest arm span. Ask students to explain their reasoning. Then ask students to suggest other measurable attributes of their bodies that they could directly compare, such as their height or the length of their feet.

Connect to other subject areas. For example, suppose that the students have been collecting rocks for classroom observation and they wanted to know if they have collected typical or unusual rocks. Ask students to discuss the measurable attributes of rocks. Lead them to first comparing the weights of the rocks. Have the class chose a rock that seems to be a "typical" rock. Provide the categories: Lighter Than Our Typical Rock and Heavier Than Our Typical Rock. Students can take turns holding a different rock from the collection and directly comparing its weight to the weight of the typical rock and placing it in the appropriate category. Some rocks will be left over because they have about the same weight as the typical rock. As a class, they count the number of rocks in each category and use these counts to order the categories and discuss whether they collected "typical" rocks. Provide categories for students to use to sort a collection of objects. Each category can relate to only one attribute, like Red and Not Red or Hexagon and Not Hexagon, and contain up to 10 objects. Students count how many objects are in each category and then order the categories by the number of objects they contain.

Ask questions to initiate discussion about the attributes of shapes. Then have students sort a collection of two-dimensional and three-dimensional shapes by their attributes. Provide categories like Circles and Not Circles or Flat and Not Flat. Have students count the objects in each category and order the categories by the number of objects they contain. Have students infer the classification of objects by guessing the rule for a sort. First, the teacher uses one attribute to sort objects into two loops or regions without labels. Then the students determine how the objects

were sorted, suggest labels for the two categories and explain their reasoning.

Interdisciplinary Connections Technology Integration

- Language Arts - Vocabulary: students will connect everyday vocabulary to strengthen their understanding of mathematical terms
- Language Arts - Reading Strategies: students will utilize reading comprehension skills by acting out or drawing the order of important events in a story problem. Reading and writing stories to represent addition and subtraction
- Language Arts - Writing Strategies: students will create mathematical stories using numbers, pictures and words.
- Language Arts - Interactive Student Notebook
- Language Arts - Read Alouds
- Science: work with data/make calculations involving measurements and other data across all modules
- Social Studies - Economics- connecting money as a means for helping people buy things they need or want; complete independent/partner projects to plan and market a good or service product.
- **8.1.2.A.1** Identify the basic features of a digital device and explain its purpose.
- **8.1.2.E.1** Use digital tools and online resources to explore a problem or issue.
- **8.2.2.C.1** Brainstorm ideas on how to solve a problem or build a

Kindergarten: Interdisciplinary Connections
____ Language Arts ____ Science ____ Social Studies ____ World Languages ____ Arts
21st Century Themes
___ Global Awareness ___ Financial, Economic, Business and Entrepreneurial Literacy ___ Civic Literacy ___ Health Literacy ___ Environmental Literacy

21st Century Life and Careers Standards

Career Ready Practices:

☒ 9.4.2.CI.1: Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2)

☒ 9.4.2.CI.2: Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a)

☐ 9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2)

☒ 9.4.2.CT.2: Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3

☒ 9.4.2.DC.3: Explain how to be safe online and follow safe practices when using the internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).

☐ 9.4.2.DC.6: Identify respectful and responsible ways to communicate in digital environments

☒ 9.4.2.TL.2: Create a document using a word processing application

☐ 9.4.2.TL.5: Describe the difference between real and virtual experiences

☐ 9.1.2.CAP.1: Make a list of different types of jobs and describe the skills associated with each job..

☐ 9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community

☐ 9.1.2.CR.2: List ways to give back, including making donations, volunteering, and starting a business.

Unit 4 Kindergarten- Place Value and Geometric Shapes

Content Standards	**Suggested Mathematical Practice P21 Skills**	**Critical Knowledge & Skills**
● K.CC.A.1. Count to 100 by ones and by tens. *(benchmarked)	MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Creativity and Innovation Communication and Information Literacy	Concept(s): ● Number names and the count sequence up to 100 Students are able to: ● count orally by ones up to 100. ● count orally by tens up to 100. Learning Goal 1: Count to 100 by ones and by tens.

● K.OA.A.5. Demonstrate fluency for addition and subtraction within	MP.7 Look for and make use of structure.	Concept(s): No new concept(s) introduced Students are able to: ● add and subtract within 5 with accuracy and efficiency.

5 (by the end of Kindergarten). *(benchmarked)	MP.8 Look for and express regularity in repeated reasoning. Creativity and Innovation Communication and Information Literacy	Learning Goal 2: Fluently add and subtract within 5.

● 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).*	MP.7 Look for and make use of structure. Creativity and Innovation Critical Thinking and Problem Solving	Concept(s): ● Orientation does not alter attributes or size. ● Shapes may have sides of unequal or equal length. ● Shapes may or may not have the same number of sides or 'corners'. Students are able to: ● compare two- and three- dimensional shapes in different sizes and in different orientations and identify similarities and differences. ● compare parts of two- and three-dimensional shapes [e.g. number of sides, number of vertices (*corners*)]. ● compare attributes of two- and three-dimensional shapes [e.g. sides have equal length.] ● use informal language to describe similarities, differences, parts, and other attributes when comparing two-and three-dimensional shapes, in different sizes and orientations. Learning Goal 3: Use informal language to describe similarities, differences, parts number of sides, number of *corners*), and other attributes (having sides of equal length) when comparing two- and three- dimensional shapes, in different sizes and orientations.
● K.G.B.5. Model shapes in the world by building shapes from	MP.1 Make sense of problems and persevere in solving them.	Concept(s): ● Basic shapes exist in real world objects.

components *(e.g., sticks and clay balls)* and drawing shapes.	MP.4 Model with mathematics. MP.7 Look for and make use of structure. Creativity and Innovation Critical Thinking and Problem Solving	Students are able to: ● recognize basic shapes in the real world. ● use objects (clay, sticks, etc.) to model shapes. ● model shapes in the world by drawing shapes. Learning Goal 4: Model shapes in the world by building and drawing shapes.
● K.G.B.6. Compose simple shapes to form larger shapes. *r example: "Can you join these two triangles with full sides touching to make a rectangle?"*	MP.1 Make sense of problems and persevere in solving them. MP.4 Model with mathematics. MP.7 Look for and make use of structure. Creativity and Innovation Critical Thinking and Problem Solving	Concept(s): ● Shapes can be combined to make larger shapes. Students are able to: ● compose simple shapes to form larger shapes. Learning Goal 5*:* Compose simple shapes to form larger shapes.

● K.NBT. A.1. Compose and decompose numbers from 11 to 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. *(benchmarked)	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Creativity and Innovation	Concept(s): ● Numbers from 11 to 19 can be represented as one group of ten *ones* and another group containing fewer than ten *ones.* Students are able to: ● compose and decompose numbers from 11 to 19 into a group of ten *ones* and another group of one(s). ● use the term *ones* to describe the number of objects in each group. ● record each composition or decomposition using objects and drawings. ● record each composition or decomposition by a drawing or equation.

	Critical Thinking and Problem Solving Communication and Information Literacy	Learning Goal 6*:* Compose and decompose numbers from 11 to 19 into a group of ten and one(s) with or without manipulatives. Record each composition or decomposition through a drawing or equation.

Unit 4 Kindergarten- Place Value and Geometric Shapes

School/District Formative Assessment Plan School/District Summative Assessment Plan Benchmark Assessment Alternative Assessment

Georgia Department of Education

Exit tickets

https://www.georgiastandards.org/Georgia-Standards/Frameworks/K-Math-Unit-6.pdf https://www.georgiastandards.org/Georgia-Standards/Frameworks/K-Math-Unit-3.pdf Classwork

White boards

Individual and group work Math journals Georgia Department of Education https://www.georgiastandards.org/Georgia-Standards/Frameworks/K-Math-Unit-6.pdf	https://www.georgiastandards.org/Georgia-Standards/Frameworks/K-Math-Unit-3.pdf Benchmarks Chapter tests	Performance tasks Extended projects Teacher Created Assessments Performance Based Assessments Extension Projects Renaissance/STAR	Map Testing DRA Benchmark Tests within EnVision/GoMath/Eureka Math/iReady State Testing Results

Focus Mathematical Concepts- Place Value and Geometric Shapes

Prerequisite skills:

Although many students have attended pre-school prior to entering kindergarten, this is the first year of school for many students. For that reason, no concepts/skills are listed as prerequisites. It is expected that teachers will differentiate to accommodate those students who may enter kindergarten with prior knowledge.

Common Misconceptions:

Students have difficulty with *ten* as a singular word that means 10 things. For many students, the understanding that a group of 10 things can be reproduced by a single object and they both represent 10 is confusing. Help students develop the sense of 10 by first using groupable materials then replacing the group with an object or representing 10. Watch and address the issue of attaching words to materials and groups without knowing what they represent. If this misconception is not addressed early on it can cause additional issues when working with numbers 11-19 and beyond.

Number Fluency: K.OA.A.5. Demonstrate fluency for addition and subtraction within 5 (by the end of Kindergarten). *(benchmarked) **District/School Tasks**

District/School Primary and Supplementary Resources

Delaware comparison documents

http://www.doe.k12.de.us/cms/lib09/DE01922744/Centricity/Domain/111/Math_Grade_K.pdf

Georgia Department of Education

https://www.georgiastandards.org/Georgia-Standards/Frameworks/K-Math-Unit-6.pdf

https://www.georgiastandards.org/Georgia-Standards/Frameworks/K-Math-Unit-3.pdf

Framework for 21st Century Learning

http://www.p21.org/our-work/p21-framework

NJDOE-21st Century Life and Careers

http://www.state.nj.us/education/aps/cccs/career/

Arizona flip book
http://www.katm.org/flipbooks/K%20FlipBook%20Final%20CCSS%202014.pdf

North Carolina wikispaces
http://maccss.ncdpi.wikispaces.net/Elementary

Georgia Department of Education Kindergarten
https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx

Engage NY
https://www.engageny.org/resource/kindergarten-mathematics-module-1

TECHNOLOGY Connection:

Patch Tool http://illuminations.nctm.org/ActivityDetail.aspx?ID=27 Students use pattern blocks to create pictures or combine shapes to make new shapes.

Cat in the Hat-The Great Shape Race
http://pbskids.org/catinthehat/games/great-shape-race.html Students collect shapes based on orientation and use those shapes to build irregular figures.

Manipulatives: counters, pattern blocks, solid figures, etc.

Learning centers

Trade books

Essential questions

Can patterns be found in numbers?

Can you describe the patterns you find?

How are the number patterns the same or different?

What is a pattern and where can you find patterns?

Does the order of addends change the sum?

How can I prove that groups are equal?

How can I find the total when I put two quantities together?

How can I find what is left over when I take one quantity away from another?

How can I solve and represent problems using objects, pictures, words and numbers? How can I use different combinations of numbers to represent the same quantity? How can strategies help us solve problems? • How can you model a math problem with objects or pictures? How do you know when your answer makes sense?

What happens when I decompose a quantity?

What happens when I join quantities together?

What happens when some objects are taken away from a set of objects

What is a number relationship? How can they help me?

What is a strategy?

What is the difference between addition and subtraction?

Why do we use mathematical symbols?

Why is it important that I can build the number combinations for the number 5? 10?

How can using benchmarked numbers help me adding or subtracting?

How can I show numbers beyond 10?

What makes shapes different from each other?

How can shapes be sorted

What makes shapes different from each other?

How can we use words that describe location in our everyday lives?

How are shapes alike and different?

How are quadrilaterals and triangles different?

How can we describe the position of a shape?

Where can we find shapes in the real world?

How can a shape be described?

What is an attribute

What are some attributes of a flat shape? Solid shape?

How do shapes fit together and come apart?

Special Education Students	English Language Learners	Students at Risk of School Failure	Gifted and Talented Students	Students with 504 Plans
● Provide a checklist for long, detailed tasks	● Use enVision Spanish Resources ● Provide text to speech for math problems	● Tiered interventions following RTI framework ● RTI Intervention Bank	● Modify activities/assignments/projects/as sessments	● Provide a checklist for long, detailed tasks

 Key:

● Use concrete examples of concepts before teaching the abstract ● Highlight important concepts to be learned in text of material ● Provide concrete examples for homework/class work assignments ● Give additional presentations by varying the methods using repetition, simpler explanations and modeling ● Give written directions to supplement verbal directions ● Familiarize student with new vocabulary before beginning lesson ● Utilize visual aids and graphic organizers ● Utilize manipulative, hands-on activities ● Provide graph paper for computation ● Additional time to complete	activities/assignments/projects/as sessments ● Modify or provide an option for alternative activities/assignments/projects/as sessments ● Small Group Instruction/Intervention/Remedia tion ● Use of translation dictionary or software ● Confer frequently ● Adapt a Strategy-Adjusting strategies for ESL students: http://www.teachersfirst.com/con tent/esl/adaptstrat.cfm ● Familiarize student with new vocabulary before beginning lesson ● Utilize visual aids and graphic organizers ● Utilize manipulative, hands-on activities	● Additional Support Materials/ Online resources ● Guided Notes or copy of teacher notes ● Review prerequisite skills ● http://www.wida.us/standards/el p.aspx ● NJDOE resources ● Utilize online resources such as www.tenmarks.com ● EnVision K-5 intervention supports ● Provide an option for alternative activities/assignments/projects/as sessments ● Provide higher-order questioning and discussion opportunities ● Utilize exploratory connections to higher grade concepts ● Modify Content ● Adjust Pacing of Content ● Small Group Enrichment ● Individual Enrichment	● Higher-Level Text ● Provide whole group enrichment explorations ● Teach cognitive and methodological skills ● Use center, stations, or contracts ● Organize integrated problem-solving simulations ● Propose interest-based extension activities ● Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles ● Provide options, alternatives and choices to differentiate and broaden the curriculum ● Propose independent projects based on individual interests ● Additional Support Materials/ Online resources ● After school clubs ● Use concrete examples of	concepts before teaching the abstract ● Highlight important concepts to be learned in text of material ● Provide concrete examples for homework/class work assignments ● Give additional presentations by varying the methods using repetition, simpler explanations and modeling ● Give written directions to supplement verbal directions ● Familiarize student with new vocabulary before beginning lesson ● Utilize visual aids and graphic organizers ● Utilize manipulative, hands-on activities ● Provide graph paper for computation ● Additional time to complete activities/assignments/projects/as

sessments
● Modify or provide an option for

alternative
activities/assignments/projects/as

sessments
● Small Group

Instruction/Intervention/Remedia
tion

● Individual
Intervention/Remediation
● Additional Support Materials/
Online resources
● Guided Notes or copy of teacher
notes
● Review prerequisite skills
● After School Tutoring
● Chunk
activities/assignments/projects/as
sessments into manageable units
● Allow student to receive reading
text in various forms (written,

verbal, audio) r on a lower
reading level
● Allow student to make test
corrections or retake assessment
● Adjust Pacing of Content
● See IEPs for specific
modifications

● Individual
Intervention/Remediation
● Additional Support Materials/ Online resources
● Guided Notes or copy of teacher notes
● Review prerequisite skills ● After School Tutoring
● Chunk
activities/assignments/projects/as sessments into manageable units ● Allow student to receive reading text in various forms (written, verbal, audio) r on a lower
reading level
● Allow student to make test corrections or retake assessment ● Adjust Pacing of Content ● See 504 plan for specific accommodations

Vocabulary Ongoing Modifications
● Tiered centers ● Tiered assignments

http://maccss.ncdpi.wikispaces.net/file/view/2014+Building+Vocabulary.pdf
Georgia Department of Education Kindergarten Intervention Tables
https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx

Engage NY
https://www.engageny.org/resource/kindergarten-mathematics-module-1

Building the language of mathematics

NC Resources for k-2 Advanced Math Learners
http://ncaigirp.ncdpi.wikispaces.net/Mathematics+K-2

Differentiated worksheets

Differentiated centers

Extra time on task

Limited # of items

ELL:

http://www.wida.us/standards/elp.aspx

NJ Model Curriculum:

https://www.state.nj.us/education/bilingual/curriculum/

Achieve the Core:

https://achievethecore.org/aligned/ccss-aligned-materials-for-ell-students/

Instructional Best Practices and Exemplars

Provide contextual situations for addition and subtraction that relate to the everyday lives of kindergarteners. A variety of situations can be found in children's literature books. Students then model the addition and subtraction using a variety of representations such as drawings, sounds, acting out situations, verbal explanations and numerical expressions. Manipulatives, like two color counters, clothespins on hangers, connecting cubes and stickers can also be used for modeling these operations.

Kindergarten students should see addition and subtraction equations written by the teacher. Although students might struggle at first, teachers should encourage them to try writing the equations. Students' writing of equations in Kindergarten is encouraged, but it is not required. Create written addition or subtraction problems with sums and differences less than or equal to 10 using the numbers 0 to 10.

It is important to use a problem context that is relevant to kindergarteners. After the teacher reads the problem, students choose their own method to model the problem and find a solution. Students discuss their solution strategies while the teacher represents the situation with an equation written under the problem. The equation should be written listing the numbers and symbols for the unknown quantities in the order that follows the meaning of the situation. The teacher and students should use the words *equal* and *is the same as* interchangeably.

Have students decompose numbers less than or equal to 5 during a variety of experiences to promote their fluency with sums and differences less than or equal to 5 that result from using the numbers 0 to 5. For example, ask students to use different models to decompose 5 and record their work with drawings or equations. Next, have students decompose 6, 7, 8, 9, and 10 in a similar fashion. As they come to understand the role and meaning of arithmetic operations in number systems, students gain computational fluency, using efficient and accurate methods for computing. The teacher can use scaffolding to teach students who show a need for more help with counting. For instance, ask students to build a tower of 5 using 2 green and 3 blue linking cubes while you discuss composing and decomposing 5. Have them identify and compare other ways to make a tower of 5. Repeat the activity
for towers of 7 and 9. Help students use counting as they explore ways to compose 7 and 9.

Use shapes collected from students to begin the investigation into basic properties and characteristics of two- and three-dimensional shapes. Have students analyze and compare each shape with other objects in the classroom and describe the similarities and differences between the shapes. Ask students to describe the shapes while the teacher records key descriptive words in common student language. Students need to use the word flat to describe two-dimensional shapes and the word solid to describe three-dimensional shapes. Use the sides, faces and vertices of shapes to practice counting and reinforce the concept of one-to-one correspondence.

The teacher and students orally describe and name the shapes found on a Shape Hunt. Students draw a shape and build it using materials regularly kept in the classroom such as construction paper, clay, wooden sticks or straws. Students can use a variety of manipulatives and real-world objects to build larger shapes with these and other smaller shapes: squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders and spheres.

Kindergarteners can manipulate cardboard shapes, paper plates, pattern blocks, tiles, canned food, wooden or foam blocks, and other common items. Have students compose (build) a larger shape using only smaller shapes that have the same size and shapes that formed it.

Interdisciplinary Connections Technology Integration

- Language Arts - Vocabulary: students will connect everyday vocabulary to strengthen their understanding of mathematical terms
- Language Arts - Reading Strategies: students will utilize reading comprehension skills by acting out or drawing the order of important events in a story problem. Reading and writing stories to represent addition and subtraction
- Language Arts - Writing Strategies: students will create mathematical stories using numbers, pictures and words.
- Language Arts - Interactive Student Notebook
- Language Arts - Read Alouds
- Science: work with data/make calculations involving measurements and other data across all modules
- Social Studies - Economics- connecting money as a means for helping people buy things they need or want; complete independent/partner projects to plan and market a good or service
- **8.1.2.A.1** Identify the basic features of a digital device and explain its purpose.
- **8.1.2.E.1** Use digital tools and online resources to explore a problem or issue.
- **8.2.2.C.1** Brainstorm ideas on how to solve a problem or build a product.