COURSE TITLE

Grade K- Math

LENGTH

Full Year

DEPARTMENT

STEM Department

SCHOOL

Kindergarten Center

DATE

September 10, 2018

Initial BOE Approval Date (Born on): 6/15/2015

Grade K- Math

I. Introduction/Overview/Philosophy

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.

II. Objectives

Course Outline:

1. Numbers 1-5:
    a. One and two
    b. Three to five
2. Numbers 1-10
    a. 6-10
    b. comparing
    c. one to one correspondence
3. Numbers to 20
    a. Numbers 10-15
    b. Numbers 16-20
    c. Compare and order
4. Solid and Flat Shapes
    a. Solid shapes
    b. Flat shapes
    c. Shape patterns
5. Comparing and Identifying Numbers to 99
    a. 20-49
    b. 50-74
    c. 75-100

6. Number Facts
    a. Counting on
    b. Counting back
    c. Comparing numbers
7. Addition
    a. Number sentences
    b. Addition facts to 5
8. Subtractions
    a. Number Sentences
    b. Facts within 5
    c. Comparing Sets
9. Measurement
    a. Compare weight/capacity
    b. Compare events in time
    c. Position words

Student Outcomes:

After successfully completing this course, the student will:

- Analyze, compare, create, and compose shapes
- Classify and count the number of objects in categories
- Compare numbers
- Count to tell the number of objects
- Describe and compare measurable attributes
- Fluently add and subtract within 5
- Know number names and the count sequence to 100
- 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

New Jersey Student Learning Standards

CAREER READY PRACTICES

CRP1 Act as a responsible and contributing citizen and employee.

Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.

CRP2 Apply appropriate academic and technical skills.

Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation

CRP4 Communicate clearly and effectively and with reason.

Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.

CRP6. Demonstrate creativity and innovation.
Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.

TECHNOLOGY

Standard 8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
Strand B. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
8.1.2.B.1- Illustrate and communicate original ideas and stories using multiple digital tools and resources.
Strand C. Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
8.1.2.C.1- Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media.
Strand E: Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.
8.1.2.E.1- Use digital tools and online resources to explore a problem or issue.

Standard 8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
Strand C. Design: The design process is a systematic approach to solving problems.
8.2.2.C.1- Brainstorm ideas on how to solve a problem or build a product.
Strand D. Abilities for a Technological World: The designed world is the product of a design process that provides the means to convert resources into products and systems.
8.2.2.D.1- Collaborate and apply a design process to solve a simple problem from everyday experiences.

Strand E. Computational Thinking: Programming: Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.
8.2.2.E.1- List and demonstrate the steps to an everyday task.

21ST CENTURY LIFE AND CAREERS

9.2 Career Awareness, Exploration, and Preparation

Strand A: Career Awareness

9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

NEW JERSEY STUDENT LEARNING STANDARDS- MATH

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.
K.CC.A.1. Count to 100 by ones and by tens.
K.CC.A.2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
K.CC.A.3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects
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 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.

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.
K.CC.C.6. Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group e.g. by using matching and counting strategies.
K.CC.C.7. Compare two numbers between 1 and 10 presented as written numerals.
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.
K.G.A.2. Correctly name 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”)
K.G.B.4. Analyze and compare two- and three- dimensional shapes, in different sizes, and orientations, using informal language to describe their similarities, differences, parts (e.g. number of sides and vertices “corners”) and other attributes (e.g. having sides of equal length).
K.G.B.5. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
K.G.B.6. Compose simple shapes to form larger shapes.
K.MD.A.1. Describe measurable attributes of objects, such as length or weight. 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.
K.MD.B.3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.

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

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

III. Proficiency Levels

This curriculum is appropriate for all kindergarten students.

IV. Methods of Assessment

Student Assessment
The teacher will provide a variety of assessments during the course of the year. The assessment may include but is not limited to: chapter and unit tests and quizzes, teacher observations, open-ended problems, cooperative work, and homework.

Curriculum/Teacher Assessment
The teacher will provide the subject area supervisor with suggestions for changes on an ongoing basis.

V. Grouping

This curriculum is appropriate for all students in kindergarten.

VI. Articulation/Scope & Sequence/Time Frame

Course length is one year.

VII. Resources

Texts/Supplemental Reading/References

Math in Focus, Marshall Cavendish, 2015

VIII. Suggested Activities

Appropriate activities are listed in the curriculum map.

IX. Methodologies

The following methods of instruction are suggested: teacher guided explorations, working in groups/working with a partner, working with manipulatives and discovery activities.

X. Interdisciplinary Connections

At this grade level, connections to many other disciplines are appropriate and natural. Reading and writing become an integral part of the mathematics process. Connections with science are frequent throughout both curricula. Technology plays an important part in learning mathematics as well.

XI. Differentiating Instruction for Students with Special Needs: Students with Disabilities, Students at Risk, English Language Learners, and Gifted & Talented Students

Differentiating instruction is a flexible process that includes the planning and design of instruction, how that instruction is delivered, and how student progress is measured. Teachers recognize that students can learn in multiple ways as they celebrate students' prior knowledge. By providing appropriately challenging learning, teachers can maximize success for all students.

Differentiating in this course includes but is not limited to:

Differentiation for Support (ELL, Special Education, Students at Risk)

- Peer mentoring on problems
- Differentiated teacher feedback on assignments
- Modeling out problems on whiteboard
- Visual aids as we project problems on whiteboard
- Study guides
- Tiered assignments
- Scaffolding of materials and assignments
- Re-teaching and review
- Guided note taking
- Exemplars of varied performance levels
- Multi-media approach to accommodating various learning styles

Differentiation for Enrichment

- Supplemental reading material for independent study
- Flexible grouping
- Tiered assignments
- Topic selection by interest
- Enhanced expectations for independent study
- Elevated questioning techniques using Webb's Depth of Knowledge matrix

XII. Professional Development

The teacher will continue to improve expertise through participation in a variety of professional development opportunities.

XII. Curriculum Map/Pacing Guide

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
Numbers 1-5: • One and two • Three to five	4 weeks	*For Support:* Introduce touch points for numbers 1-5. Utilize number line Provide positive peer model for numbers through 5 identification and one to one correspondence *For Enhancement:* Expand numbers introduced. Incorporate word problems with numbers through 5. Teach words one, two, three, four, five	K.CC.A.1,2,3 K.CC.B.4 K.CC.C.6,7 CRP1,2,4,6,7,8,11,12 8.1.2.B.1, 8.1.2.C.1, 8.1.2.E.1 8.2.2.C.1, 8.2.2.D.1, 8.2.2.E.1 9.2.4.A.4	*Summative:* Chapter 1 Assessment *Formative:* Match numerals1-5 and sets of objects Identify sets of objects that are the same/ different not to exceed sets of 5.
Numbers 1-10 • 6-10 • comparing • one to one correspondence	4 weeks	*For Support:* Utilize/teach touch points for numbers 6-9. Reduce numbers responsible for. Utilize number line *For Enhancement:* Expand numbers introduced. Incorporate word problems. Teach number words zero, six, seven, eight, nine, and ten	K.CC.A.1,2,3 K.CC.B.4 K.CC.C.6,7 K.O.A.1 CRP1,2,4,6,7,8,11,12 8.1.2.B.1, 8.1.2.C.1, 8.1.2.E.1 8.2.2.C.1, 8.2.2.D.1, 8.2.2.E.1 9.2.4.A.4	*Summative:* Chapter 2 Assessment Chapter 4 Assessment *Formative:* Match numerals and sets of objects through 10. Identify one more/ one less not to exceed 10 Demonstrate one to one correspondence not to exceed 10.
Numbers to 20 • Numbers 10-15 • Numbers 16-20	4 weeks	*For Support:* Utilize touch points on numbers through 9. Reduce numbers responsible for. Utilize number line	K.CC.A.1,2,3 K.CC.B.4 K.CC.C.6,7 K.O.A .1	*Summative:* Chapter 6 Assessment *Formative:*

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
• Compare and order		Provide visuals and place value manipulatives Pre-teach vocabulary (fewer/more/greater/less) *For Enhancement:* Expand numbers introduced. Incorporate word problems. Compare and order larger sets of numbers.	K.NBT.A.1 CRP1,2,4,6,7,8,11,12 8.1.2.B.1, 8.1.2.C.1, 8.1.2.E.1 8.2.2.C.1, 8.2.2.D.1, 8.2.2.E.1 9.2.4.A.4	Identify sets with more/fewer Identify and sequence numbers through 10 Identify and sequence numbers through 20
Solid and Flat Shapes • Solid shapes • Flat shapes • Shape patterns	4 weeks	*For Support:* Peer partner when working with shapes Use of hands on shapes as manipulatives Modify expectations to develop and expand patterns. Provide real life examples of solid or flat shapes in our environment. *For Enhancement:* Develop and expand patterns to a higher level. Introduce vocabulary –corners, sides, roll, slide	CRP1,2,4,6,7,8,11,12 8.1.2.B.1, 8.1.2.C.1, 8.1.2.E.1 8.2.2.C.1, 8.2.2.D.1, 8.2.2.E.1 9.2.4.A.4	*Summative:* Chapter 7 Assessment *Formative:* Identify shapes in real life Develop and extend patterns. Identify shapes as two-and three-dimensional
Comparing and Identifying Numbers to 99 • 20-49 • 50-74 • 75-100	4 weeks	*For Support:* Utilize/teach touch points for numbers 6-9. Reduce numbers responsible for. Utilize 100s chart *For Enhancement:* Expand numbers introduced. Incorporate word problems comparing numbers.	K.CC.A.1,2,3 K.CC.B.4 K.CC.C.6,7 CRP1,2,4,6,7,8,11,12 8.1.2.B.1, 8.1.2.C.1, 8.1.2.E.1 8.2.2.C.1, 8.2.2.D.1, 8.2.2.E.1 9.2.4.A.4	*Summative:* Chapter 8 Assessment Chapter 9 Assessment *Formative:* Count by 10's to 100 Model tens/one place value Number identification through 100 Identify greater/lesser numbers in

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
				a set.
Number Facts • Counting on • Counting back • Comparing numbers	4 weeks	*For Support:* Teach how to use and provide manipulatives Utilize touch points for numbers through 9. Utilize number line Provide visuals and manipulatives *For Enhancement:* Expand numbers introduced counting on to and from. Incorporate word problems. Compare and order larger sets of numbers.	K.CC.A.1,2,3 K.CC.B.4 K.CC.C.6,7 K.O.A1,2,3,4,5 K.NBT.A.1 CRP1,2,4,6,7,8,11,12 8.1.2.B.1, 8.1.2.C.1, 8.1.2.E.1 8.2.2.C.1, 8.2.2.D.1, 8.2.2.E.1 9.2.4.A.4	*Summative:* Chapter 12 Assessment Chapter 14 Assessment *Formative:* Compose and Decompose numbers Strategy identification
Addition • Number sentences • Addition facts to 5	5 weeks	*For Support:* Teach how to use and provide manipulatives to find sums. Utilize touch points for numbers through 9. Utilize number line Provide visuals and manipulatives *For Enhancement:* Expand numbers introduced counting on to and from. Incorporate word problems.	K.CC.A.1,2,3 K.CC.B.4 K.CC.C.6,7 K.OA.A.1,2,4,5 CRP1,2,4,6,7,8,11,12 8.1.2.B.1, 8.1.2.C.1, 8.1.2.E.1 8.2.2.C.1, 8.2.2.D.1, 8.2.2.E.1 9.2.4.A.4	*Summative:* Chapter 17 Assessment *Formative:* Create combinations of 5 Additions facts Number fluency through 5 Write addition sentences
Subtractions • Number Sentences • Facts within 5 • Comparing Sets	5 weeks	*For Support:* Teach how to use and provide manipulatives Utilize touch points for numbers through 9. Utilize number line Provide visuals and manipulatives *For Enhancement:*	K.CC.A.1,2,3 K.CC.B.4 K.CC.C.6,7 K.OA.A.5,4,3,2,1 CRP1,2,4,6,7,8,11,12 8.1.2.B.1, 8.1.2.C.1, 8.1.2.E.1 8.2.2.C.1, 8.2.2.D.1,	*Summative:* Chapter 18 Assessment *Formative:* Write subtraction sentences Solve subtraction equations Subtraction fluency Decompose sets of 5

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
		Expand numbers counting back from. Incorporate word problems. Identify key words to identity subtraction including difference, how many are left Compare and order larger sets of numbers.	8.2.2.E.1 9.2.4.A.4	
Measurement • Compare weight/capacity • Compare events in time • Position words	6 weeks	*For Support:* Provide manipulatives Make real life connections Pre-teach vocabulary, (heavy, light, more, less) *For Enhancement:* Identify real life applications and purpose Word Problems.	K.CC.C.6 K.G.A.1,2,3 K.G.B.4,5,6 CRP1,2,4,6,7,8,11,12 8.1.2.B.1, 8.1.2.C.1, 8.1.2.E.1 8.2.2.C.1, 8.2.2.D.1, 8.2.2.E.1 9.2.4.A.4	*Summative:* Chapter 15 Assessment Chapter 16 Assessment Chapter19 Assessments *Formative:* Use tools for measurement Classify objects Identify similarities/differences Compare using nonstandard units