MATHEMATICS – GRADE 1

EWING PUBLIC SCHOOLS
2099 Pennington Road
Ewing, NJ 08618

BOE Approval Date: March 18, 2019 Michael Nitti
Revised by: Donald Wahlers Superintendent

In accordance with The Ewing Public Schools' Policy 2230, Course Guides, this curriculum has been reviewed and found to be in compliance with all policies and all affirmative action criteria.

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Course Description and Rationale

In this first grade course in mathematics, students will delve into the base ten structure of our number system, uncovering and discovering patterns which they will utilize to develop visual images of quantities, compose and decompose numbers and begin to formulate strategies for the numerical operations of addition and subtraction. Students will also investigate the characteristics and attributes of 2-dimensional and 3-dimensional shapes, collect and analyze data, and explore the role of standardizing units in measuring length.

Students will use the following eight Mathematics Practices to demonstrate understanding of the mathematics process:

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

This course is a year-long course that meets for 60 minutes per day. The course uses a constructivist approach to investigate relationships in math. This approach will be balanced with a level of practice needed to attain skill mastery. Throughout the course, students will be actively engaged in problem solving through reasoning. Students will be expected to communicate their reasoning and problem solving on a daily basis though written and verbal formats.

In the end, the goal of this course is to develop young mathematicians with the habits of mind enabling them to meet the vision shared below; enabling their future success in mathematics.

The course content is arranged into four units of study:

- Unit 1: Data, the Number System, Problem-Solving, and Addition
- Unit 2: Problem-Solving, Addition, and Subtraction
- Unit 3: Fact Fluency & Properties of Operations, Working with the Number System, Time
- Unit 4: Working with the Number System, Fractions, Time, Measurement, and Shapes

Math Vision

The Ewing Public Schools will deliver an instructional program in mathematics where students are actively engaged in the discovery of math concepts and are applying these concepts in ways that they find meaningful and relevant.

Ewing students will be mathematical thinkers who can reason, communicate and solve problems.

Ultimately, Ewing students will master and will be able to utilize these math concepts and skills throughout their lives.

21st Century Skills - During this course, students will work on developing, to an age appropriate level, the following 21st century skills:

Career Readiness Pathways:

- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively and with reason.
- CRP6. Demonstrate creativity and innovation.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP12. Work productively in teams while using cultural global competence.

Learning and Innovation Skills

Creativity and Innovation

Think Creatively

- Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts

Work Creatively with Others

- View failure as an opportunity to learn; understand that creativity and innovation is a long-term, cyclical process of small successes and frequent mistakes

Critical Thinking And Problem Solving

Reason Effectively

- Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation

Use Systems Thinking

- Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems

Make Judgments and Decisions

- Effectively analyze and evaluate evidence, arguments, claims and beliefs
- Synthesize and make connections between information and arguments
- Interpret information and draw conclusions based on the best analysis

Solve Problems

- Identify and ask significant questions that clarify various points of view and lead to better solutions

Communication And Collaboration

Communicate Clearly

- Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts
- Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions
- Use communication for a range of purposes (e.g. to inform, instruct, motivate and persuade)
- Utilize multiple media and technologies, and know how to judge their effectiveness a priori as well as assess their impact
- Communicate effectively in diverse environments (including multi-lingual)

Collaborate with Others

- Assume shared responsibility for collaborative work, and value the individual contributions made by each team member

Information, Media, and Technology Skills

Informational Literacy

Access and Evaluate Information

- Evaluate information critically and competently

Use and Manage Information

- Use information accurately and creatively for the issue or problem at hand

Life and Career Skills

Social and Cross-Cultural Skills

Interact Effectively with Others

- Know when it is appropriate to listen and when to speak

Work Effectively in Diverse Teams

- Respond open-mindedly to different ideas and values

Be Responsible to Others

- Act responsibly with the interests of the larger community in mind

Technology Integration

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 create and communicate knowledge.

ELA Integration:

NJSLS.RI.1.1. Ask and answer questions about key details in a text.
NJSLS.RI.1.2. Identify the main topic and retell key details of a text.
NJSLS.RI.1.4. Ask and answer questions to help determine or clarify the meaning of words and phrases in a text.
NJSLS.RI.1.6. Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.
NJSLS.RI.1.7. Use the illustrations and details in a text to describe its key ideas.
NJSLS.SL.1.1. Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers and adults in small and larger groups.

A. Follow agreed-upon norms for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).
B. Build on others' talk in conversations by responding to the comments of others through multiple exchanges.
C. Ask questions to clear up any confusion about the topics and texts under discussion.

NJSLS.SL.1.2. Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
NJSLS.SL.1.5. Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.

Unit 1: Data, The Number System, Problem-Solving, and Addition [Pacing: 39 Days]

Why Is This Unit Important?

In this unit, students continue to develop ideas about counting and quantity, the composition of numbers, including work with place value, the structure of the base-ten number system and the operations of addition and subtraction. In this unit students will focus on building number sense through counting, representing quantities, and through composing and decomposing numbers. Students also work with the operation of addition, developing strategies for combining quantities, understanding the meaning of the = symbol, and recording equations. Another key focus of this unit is developing the understanding that data may be collected, organized, and analyzed to help one better understand the world.

The big ideas embedded in this unit are:

- Our number system is structured around base ten.
- Information (data) can be organized to help us understand something about the world around us.
- Addition is a process for finding the total of separate parts that are being combined in "put together" or "add to" situations.

Enduring Understandings:

- Understand that number names and written numerals are connected to the quantities they represent
- Understand that 10 is an important number in our number system
- Understand the = symbol represents the idea that the value on one side of the symbol "means the same as" the value on the other side of the symbol
- Understand that data are pieces of information that can help one understand a question about the world
- Understand that an object can be described by its features, called attributes
- Understand that an object can be categorized by attributes, and can often be categorized in more than one way based on its different attributes
- Understand that "put together" and "add to" situations can be interpreted as addition
- Understand that counting is related to addition and subtraction (e.g., count on 1 to add 1)
- Understand how the quantities in the counting sequence are related: each number is 1 more or 1 less than the number before or after it
- Understand that numbers 11 to 19 can be thought of as a ten and some ones
- Understand that story problems describe a situation that can be visualized and represented with objects, drawings, words, numbers, and symbols

Essential Questions:

- How can we organize information to help us understand something about the world?
- What does a set of data tell us about our (group, class, school, neighborhood, etc.)?
- What do you notice about ten ones?
- What relationships do you see with the pairs of numbers that make a sum of 10?
- What are we doing when we add?
- How can we represent a value or act out an addition situation using objects, drawings, or math tools such as ten frames or number lines?

Acquired Knowledge:

- Tally marks are lines organized in groups of 5 used to keep track when counting
- Data can be tracked and represented with tally marks and numerals
- Attributes are distinguishing features of an object
- Objects can be described by many different attributes
- Objects can be interpreted as a data set
- Ten ones is the same as one ten
- Numbers 11 – 19 can be decomposed into a ten and some ones
- Number relationships can be described using equations
- An "equal sign" (=) is used to show that the value on one side of the symbol "is equivalent to" or "means the same as" the value on the other side of the symbol
- Addition and subtraction situations can be represented with objects, drawings, words, and numbers and symbols (equations)
- "Put together" and "add to" situations can both be thought of as addition situations
- Two values may be combined to make a sum
- A number line is a tool for representing numbers, in which smaller values are to the left and larger numbers to the right
- Number lines may be used to represent and solve addition situations by locating a given starting number and advancing a given number of increments; the final location on the number line represents the sum

Acquired Skills:

- Count by ones, starting at any given number (between 1 and 30)
- Read and write numerals
- Represent a number of objects with a written numeral
- Identify pairs of addends that have a sum of ten
- Add within 10
- Identify number names and written numbers to the quantities they represent
- Develop and analyze visual images for quantities up to 10
- Find and explore relationships among combinations of numbers up to 10

- Use the number line as a tool for counting
- Use tally marks to track data
- Organize and represent data
- Ask and answer questions about the total number of data points, how many in each category, and how many more or less in one category than another
- Identify attributes of an object
- Sort a set of objects by their attributes
- Identify and represent numbers on a ten frame
- Represent addition and subtraction situations on a ten frame
- Demonstrate fluency when adding or subtracting 1 from a given number equal to or less than 10
- Identify pairs of addends, or a missing addend when given a number, that make a sum of 10
- Decompose numbers 11 to 19 into a ten and some ones, and represent this decomposition using numbers (branching) and visual representations (double ten frame)
- Solve "put together" and "add to" story problems by visualizing and describing the action, representing the situation with objects or drawings, and recording a corresponding equation
- Solve "put together" and "add to" story problems in which the result or total is unknown
- Find the sum of two small quantities and record the corresponding equation

Instructional Materials:

- Quarter 1 Math Module
- Investigations in Number, Data and Space for the Common Core Education, Pearson Education, Inc.
- Investigations in Number, Data and Space, Manipulatives Kit for Grade 1
- Investigations in Number, Data and Space, Cards Package for Grade 1
- Balance scale
- Base Ten manipulatives
- Buttons
- Chart paper
- Classroom calendar
- Color tiles
- Connecting cubes
- Decahedron dice
- Digi-blocks
- Dot cubes (six-sided dice)
- Geoblocks
- Number Lines
- Pattern blocks
- Power Polygons
- Primary Number Cards
- SmartPals, Communicators, or dry erase boards
- Sticky notes
- Ten-frames

- *Ten Friends* by Bruce Goldstone
- Two-color counters

Differentiation:

Enrichments:

- Make Ten
- Tens Go Fish
- Fast Ten Buddies
- Uncover Ten

Supplements:

- Shake & Spill
- Ten Frame Puzzle Match Up
- 1 More Scoop

Assessments:

Formative Assessments:

- Assessment Checklist for Counting Strategies
- Assessment Checklist for Addition (Subitizing, Counting On, Accuracy, and Recording)
- Teacher's observation of students at work; anecdotal records
- Individual conferences and group discussions
- Students' recording sheets

Summative Assessments:

- Teacher's observation of students at work
- Individual conferences
- End-of-Unit Assessment Workshop

Benchmarks

- Quarterly Mathematics Assessments

Alternative Assessments:

- Modified tasks and assessment rubrics

List of Applicable New Jersey State Standards for Mathematics Covered in This Unit:

- NJSLS.1.OA.A.1
- NJSLS.1.OA.C.5
- NJSLS.1.OA.C.6
- NJSLS.1.OA.D.7
- NJSLS.1.NBT.A.1
- NJSLS.1.NBT.B.2a
- NJSLS.1.NBT.B.2b
- NJSLS.1.MD.C.4
- NJSLS.MP 1-8

Suggested Learning Experiences and Instructional Activities:

- Introduction to Morning Meeting
- Introduction to the Calendar
- Changing the Calendar
- All About 10!
- Introduction to Data Collection
- Organize and Represent Data
- Using Tally Marks to Count
- Describing Attributes and Sorting
- Represent and Interpret Data
- Using Ten Frames
- Add or Subtract 1
- Using Ten Frames and Tally Marks
- Represent Data in a Variety of Ways
- Solve Word Problems Using Visualization
- Addition as Add To
- Addition as Add To or Put Together
- Introduction to the Number Line
- Working on the Number Line

Technology:

- 3-Act Task: "The Juggler" https://gfletchy.com/the-juggler/
- Virtual Manipulatives and Games: http://nlvm.usu.edu/en/nav/topic_t_1.html
- Ten Frame games from NCTM: https://www.nctm.org/Classroom-Resources/Illuminations/Interactives/Ten-Frame/
- Molly Adds and Subtracts from 10: http://www.abcya.com/kindergarten_word_problems_add_subtract.htm
- Monster Mansion – Number Match: http://www.abcya.com/number_match.htm
- Fun 4 The Brain Addition Games: http://www.fun4thebrain.com/addition.html
- Arithmetic Baseball: http://www.funbrain.com/math/index.html

Morning Meeting Activities:

- Using a Daily Schedule
- Using a Calendar
- Tracking the Days of School by Building a Number Line
- Counting

Unit 2: Problem-Solving, Addition, and Subtraction [Pacing: 45 Days]

Why Is This Unit Important?

In this unit, students continue to develop ideas about counting and quantity, the composition of numbers, including work with place value, the structure of the base-ten number system and the operations of addition and subtraction. This second unit allows students the opportunity to explore a wider range of addition and subtraction situations in which the unknown is in various locations. Students will work on developing strategies for understanding, describing, and representing the action and meaning of addition and subtraction. Additionally, students will explore two-digit numbers and place value concepts for tens and ones.

The big ideas embedded in this unit are:

- Our number system is structured around base ten.
- Addition is a process for finding the total of separate parts that are being combined in "put together" or "add to" situations.
- Subtraction is a process for finding the difference between two values. This may be interpreted as the result when taking a portion of a starting quantity in a "take away" situation, or as the difference between two values in a "comparison" situation.

Enduring Understandings:

- Understand the = symbol represents the idea that the value on one side of the symbol "means the same as" the value on the other side of the symbol
- Understand that "put together" and "add to" situations can be interpreted as addition
- Understand that story problems describe a situation that can be visualized and represented with objects, drawings, words, numbers, and symbols
- Understand that operations have properties that one may generalize to any situation within that operation; the associative property of addition allows one to put addends together in any order without effecting the sum
- Understand the structure of place value tools such as a 100 chart and base ten materials
- Understand that a two-digit number may be decomposed into some tens and some ones and that the number of tens and ones determines a number's value
- Understand that numbers may be compared by thinking about place value
- Understand that "take from" situations can be interpreted as subtraction
- Understand that "compare" situations can be interpreted as subtraction

Essential Questions:

- How can we describe the action or meaning of this story problem?
- How can we represent the action or meaning of this story problem?
- How can we use what we know about the properties of addition and subtraction to help us understand and solve this problem?
- How can we use tools to represent the value of a number?
- How can we describe the value of these numbers? How do you know which number has a greater or lesser value?

Acquired Knowledge:

- An "equal sign" (=) is used to show that the value on one side of the symbol "is equivalent to" or "means the same as" the value on the other side of the symbol
- Addition and subtraction situations can be represented with objects, drawings, words, and numbers and symbols (equations)
- Number lines may be used to represent and solve addition situations by locating a given starting number and advancing forward a given number of increments; the final location on the number line represents the sum
- Number lines may be used to find a missing addend by determining the distance between the starting value and the resulting value
- An "add to" problem can be interpreted by thinking about what happened at the beginning, middle, and end of the story context
- Some story problems involve more than one possible answer (both addends unknown)
- It is possible to add more than two values together; the associative property of addition allows one to select the order in which the addends are added without effecting the sum
- A 100 chart is a tool that organizes the numbers 1 through 100 in ten rows of ten, and a hundred flat is a base ten material that can be exchanged for 10 ten rods
- A two-digit number may be decomposed into a number of tens (as indicated in the tens place) and a number of ones (as indicated in the ones place)
- The symbol < means "less than" and indicates that the value to the left of the symbol has a lesser value than the number to the right of the symbol
- The symbol > means "greater than" and indicates that the value to the left of the symbol has a greater value than the number to the right of the symbol
- Number lines may be used to represent and solve subtraction situations by locating a given starting number and moving back a given number of increments; the final location on the number line represents the difference
- A "take away" problem can be interpreted as subtraction
- A "compare" problem can be interpreted as subtraction

Acquired Skills:

- Use the number line as a tool for adding on
- Use the number line as a tool for finding missing addends
- Find a missing addend and record or complete a corresponding equation
- Solve story problems by visualizing and describing the action, representing the situation with objects or drawings, and recording a corresponding equation
- Solve "put together" and "add to" story problems in which the result or total is unknown
- Solve "add to" story problems in which the change is unknown
- Create story problems to match a given addition situation, in which either the result or change is unknown
- Solve "put together/take apart" problems in which both addends are unknown; identify more than one possible answer
- Identify pairs of addends with sums of 10
- Explain the associative property of addition in age-appropriate terms, using examples
- Use the associative property of addition to solve problems in which there are 3 addends
- Solve "add to" problems in which the starting value is unknown
- Identify the number being represented when presented with a set of base ten materials (ten rods and unit cubes)
- Generate a representation for a two-digit number by building it with base ten materials or drawing symbols to represent the base ten materials
- Compare two numbers by considering place value; record the comparison using the symbols <, >, or =
- Use the number line as a tool for subtracting
- Subtract one small value from another; record the subtraction with an equation
- Solve "take from" problems in which the result is unknown
- Solve "compare" problems in which the difference is unknown

Instructional Materials:

- Quarter 2 Math Module
- Investigations in Number, Data and Space for the Common Core Education, Pearson Education, Inc.
- Investigations in Number, Data and Space, Manipulatives Kit for Grade 1
- Investigations in Number, Data and Space, Cards Package for Grade 1
- Base Ten manipulatives
- Chart paper
- Classroom calendar
- Color tiles
- Connecting cubes
- Counting bears
- Decahedron dice
- Digi-blocks

- Dot cubes (six-sided dice)
- Hundred chart
- Number Cubes, labeled 7 - 12
- Number Lines
- Primary Number Cards
- SmartPals, Communicators, or dry erase boards
- Sticky notes
- Ten-frames
- Two-color counters

Differentiation:

Enrichments:

- Make Ten
- Tens Go Fish
- Fast Ten Buddies
- Uncover Ten

Supplements:

- Shake & Spill
- Ten Frame Puzzle Match Up
- 1 More Scoop

Assessments:

Formative Assessments:

- Assessment Checklist for Problem-Solving
- Assessment Checklist for Place Value Understanding
- Teacher's observation of students at work; anecdotal records
- Individual conferences and group discussions
- Students' recording sheets

Summative Assessments:

- Teacher's observation of students at work
- Individual conferences
- Q2 Assessment

Benchmarks

- Quarterly Mathematics Assessments

Alternative Assessments:

- Modified tasks and assessment rubrics
- Performance-based assessment tasks

List of Applicable New Jersey State Standards for Mathematics Covered in This Unit:

- NJSLS.1.OA.A.1
- NJSLS.1.OA.A.2
- NJSLS.1.OA.B.3
- NJSLS.1.OA.B.4
- NJSLS.1.OA.C.5
- NJSLS.1.OA.C.6
- NJSLS.1.OA.D.7
- NJSLS.1.OA.D.8
- NJSLS.1.NBT.A.1
- NJSLS.1.NBT.B.2
- NJSLS.1.NBT.B.3
- NJSLS.MP 1-8

Suggested Learning Experiences and Instructional Activities:

- Using Number Lines
- Using Strategies to Solve Problems
- Decomposing Numbers
- Decomposing Numbers to Solve Problems
- Using 3 Addends to Solve Problems
- Using the Associative Property to Solve Problems
- Using Strategies to Count
- Exploring Place Value
- Subtraction as Taking From
- Subtraction as Comparison
- Using Strategies for Subtraction
- Using Strategies to Solve Problems Involving Data
- Representing and Solving Problems Involving Addition and Subtraction
- Composing Addition and Subtraction Word Problems

Technology:

- 3-Act Task: "Rows of Oranges" https://learningfromchildren.org/3-act-tasks/rows-of-oranges/
- Virtual Manipulatives and Games: http://nlvm.usu.edu/en/nav/topic_t_1.html
- Ten Frame games from NCTM: https://www.nctm.org/Classroom-Resources/Illuminations/Interactives/Ten-Frame/
- Comparing Number Values Jr.: http://www.abcya.com/comparing_number_values_jr.htm
- Interactive Number Chart: http://www.abcya.com/interactive_100_number_chart.htm
- Base Ten Bingo (select ones and tens only): http://www.abcya.com/base_ten_bingo.htm
- Marble Math Addition: http://www.abcya.com/addition.htm
- Math Lines Addition (select ten as the target number): http://www.abcya.com/math_lines_addition.htm
- Fun 4 The Brain Addition Games: http://www.fun4thebrain.com/addition.html
- Arithmetic Baseball: http://www.funbrain.com/math/index.html

Morning Meeting Activities:

- Using a Calendar
- Tracking the Days of School by Building a Number Line
- Think Fast! with Dot Dice
- Think Fast! with Ten Frame Cards
- Think Fast! with Subitize to Ten Cards
- Snap It
- Tens Sandwiches
- Start With… Get To…
- Find My Number
- Which One Doesn't Belong?

Unit 3: Fact Fluency & Properties of Operations, Working with the Number System, and Time [Pacing: 45 Days]

Why Is This Unit Important?

In this unit, students focus on number relationships to solve problems, build understanding of the connected nature of addition and subtraction, explore properties of operations, and develop fluency for addition and subtraction to ten. Students will also explore the decomposition of numbers as a powerful strategy for solving unknown problems using known facts. Students continue to build understanding of place value as they use tools and identify patterns in order to develop the capacity to mentally add or subtract ten from a given two-digit number. This unit concludes with an introduction to telling time.

The big ideas embedded in this unit are:

- Our number system is structured around base ten.
- Operations have properties, which enable us to make generalizations when using those operations and allow us to build fluency and understanding of number relationships.
- Addition and subtraction are related operations, in which values are combined, separated, or compared.

Enduring Understandings:

- Understand the = symbol represents the idea that the value on one side of the symbol "means the same as" the value on the other side of the symbol
- Understand that the commutative property of addition means that any set of addends will be combined to create a consistent sum regardless of the order in which they are added
- Understand that components of "put together/take apart" story problems may be interpreted as information about the parts and the whole
- Understand that number relationships can be represented using equations, part/part/whole graphic organizers, or number bond graphic organizers
- Understand that addition and subtraction are related operations, in which parts are either being combined, separated, or compared
- Understand that one can use what is known about a number relationship to identify other elements of that number relationship; for example, if one knows an addition equation to be true, it may be used to identify another true addition equation and two true subtraction equations
- Understand that subtraction situations may be interpreted as "missing addend" situations
- Understand that addends may be decomposed into different parts in order to solve a larger problem, which allows one to use what is known about one number relationship to solve another
- Understand that our number system uses place value of tens and ones, and we can use that structure to identify number relationships
- Understand that time can be measured using a clock, and that we use these measurements for a variety of reasons

Essential Questions:

- How can we describe and represent the action or meaning of this story problem?
- How can we describe the relationships between the values in this story problem?
- How can we use tools to represent the relationship between these numbers?
- How can we use what we know about the relationship between these numbers to help us understand and solve related problems?
- How can we use what we know about place value to solve problems?
- How do we use a clock to tell time?

Acquired Knowledge:

- An "equal sign" (=) is used to show that the value on one side of the symbol "is equivalent to" or "means the same as" the value on the other side of the symbol
- Addition and subtraction situations can be represented with objects, drawings, words, and numbers and symbols (equations)
- The commutative property allows us to efficiently identify sums for related facts—for example, if one knows 4 + 1 = 5 then one can accurately identify that 1 + 4 also makes a sum of 5
- "Put together/take apart" problems describe parts and a whole
- A part/part/whole graphic organizer can represent a number relationship, with the "whole" representing the total value and the "parts" representing how the whole has been decomposed
- A number bond graphic organizer can represent a number relationship, with one circle representing the total value and the branched circles representing how the total value has been decomposed
- The number relationship represented on a part/part/whole or number bond graphic organizer may be interpreted as addition and subtraction situations and recorded with corresponding equations
- Addition and subtraction are related operations involving the combining, separating, or comparing of values
- One known addition or subtraction fact can be used to identify other related addition and subtraction facts, commonly referred to as a "fact family"
- Subtraction situations may be solved by thinking of the "missing addend"; "missing addend" situations may also be represented with a related subtraction equation
- Decomposing an addend is a strategy used to solve unknown problems using what is already known
- The place value structure of our number system allows us to identify patterns and add on tens in groups rather than adding on ten ones at a time
- Clocks are used to tell time; digital clocks show the time with digits, while analog clocks show the time with hands—the longer hand represents the minutes and the shorter hand represents the hours.

- Time is described using specific words (i.e., "seven o'clock") and written with specific notation (i.e., 7:00)
- The clock is based on a 12 hour period, and a given time repeats twice in a day (i.e., "7:00 in the morning" and "7:00 in the evening").

Acquired Skills:

- Explain the commutative property in age-appropriate terms, giving examples
- Use the commutative property to demonstrate fluency for addition facts within 10
- Use a part/part/whole graphic organizer to solve "put together/take apart" problems
- Solve "put together/take apart" story problems with the unknown in any position
- Represent number relationships using part/part/whole or number bond graphic organizers
- Identify missing values on partially completed part/part/whole or number bond graphic organizers
- Identify corresponding addition and subtraction equations from a given part/part/whole or number bond graphic organizer
- Identify related addition and subtraction equations from a given addition or subtraction equation ("fact families")
- Solve subtraction situations with a "missing addend" equation; explain the connection between a "missing addend" equation and the corresponding subtraction equation
- Demonstrate fluency for addition and subtraction within 10
- Solve "add to", "take from", and "put together/take apart" story problems with the unknown in any position
- Use strategies for fluency based on decomposing an addend such as "near knowns"; i.e., solving 3 + 4 by recognizing it is similar to the known fact 3 + 3 = 6, the addend 4 may be decomposed into a 3 and 1, therefore 3 + 4 = 3 + 3 + 1 = 6 + 1 = 7, and representing this with objects or drawings
- Use strategies for fluency based on decomposing an addend such as "making ten"; i.e., solving 7 + 5 by recognizing a known "ten buddy" fact of 7 + 3 = 10, the addend 5 may be decomposed into a 3 and 2, therefore 7 + 5 = 7 + 3 + 2 = 10 + 2 = 12, and representing this with objects, drawings, ten frames, or number lines
- Describe, explain, and use patterns in place value to mentally add or subtract ten from a given two-digit number, without having to count
- Tell time to the hour on an analog or digital clock
- Identify equations as true or false
- Identify expressions with equivalent values
- Count to 120, starting at any number less than 120
- Identify a missing value in a given equation
- Identify a number when it is described by its place value (i.e., base ten representation or "3 tens and 4 ones")
- Interpret data with up to 3 categories, and answer questions about the data

Instructional Materials:

- Quarter 3 Math Module
- Investigations in Number, Data and Space for the Common Core Education, Pearson Education, Inc.
- Investigations in Number, Data and Space, Manipulatives Kit for Grade 1
- Investigations in Number, Data and Space, Cards Package for Grade 1
- Base Ten manipulatives
- Chart paper
- Classroom calendar
- Clock—large classroom demonstration clock
- Clocks—student demonstration clocks
- Connecting cubes
- Decahedron dice
- Digi-blocks
- Dominoes
- Dot cubes (six-sided dice)
- *Five Little Monkeys Jumping on the Bed* by Eileen Christelow
- Hundred chart
- Number Lines
- Primary Number Cards
- SmartPals or Communicators
- Sticky notes
- Ten-frames
- *Ten Little Ladybugs* by Melanie Girth
- Two-color counters
- *Two of Everything* by Lily Toy Hong

Differentiation:

Enrichments:

- Lucky Draw Dominos
- Beautiful Double Art
- Missing Numbers
- Plus Ten Domino Train

Supplements:

- 1 More Scoop
- Domino Sort
- Domino Parking Lot
- Hundred Chart Puzzles
- Plus Ten Domino Tic-Tac-Toe

Assessments:

Formative Assessments:

- Fact Fluency Interview Recording Sheets
- Teacher's observation of students at work; anecdotal records
- Individual conferences and group discussions
- Students' recording sheets

Summative Assessments:

- Fact Fluency Check Sheets
- Teacher's observation of students at work
- Individual conferences
- Q3 Assessment

Benchmarks

- Quarterly Mathematics Assessments

Alternative Assessments:

- Modified tasks and assessment rubrics
- Performance-based assessment tasks

List of Applicable New Jersey State Standards for Mathematics Covered in This Unit:

- NJSLS.1.OA.A.1
- NJSLS.1.OA.A.2
- NJSLS.1.OA.B.3
- NJSLS.1.OA.B.4
- NJSLS.1.OA.C.5
- NJSLS.1.OA.C.6
- NJSLS.1.OA.D.7
- NJSLS.1.OA.D.8
- NJSLS.1.NBT.A.1
- NJSLS.1.NBT.B.2
- NJSLS.1.NBT.B.3
- NJSLS.1.NBT.C.5
- NJSLS.1.MD.B.3
- NJSLS.1.MD.C.4
- NJSLS.MP 1-8

Suggested Learning Experiences and Instructional Activities:

- Commutative Property of Addition
- Using Part/Part/Whole
- Related Facts & Fluency
- Commutative Property & Fluency
- Subtraction as Unknown Addend & Fluency
- Subtraction & Related Facts
- Doubles
- Doubles & Related Facts
- Compose to Ten Strategy for Adding
- Adding Ten
- Subtracting Ten
- Adding or Subtracting Ten
- Telling Time to the Hour

Technology:

- "Five Little Monkeys Jumping on the Bed" video: https://youtu.be/sfFwo7iQsDw
- "Five Little Speckled Frogs" video: https://youtu.be/TtX8yVEF0-w
- "Ten Little Lady Bugs" story: https://youtu.be/4JtpA8H_a_I
- "The Magic Pot" (Animated Stories for Kids): https://youtu.be/cYRo0o1sZ9o
- "Two of Everything" story: https://youtu.be/4ITYlQBtaiI
- "The Story of the 10 Little Pigs" – Hooked on Phonics: https://youtu.be/acZfmL4SUIc
- Interactive Demonstration Clock: https://www.visnos.com/demos/clock
- "What's the Time, Mr. Wolf?" song: https://youtu.be/wnpAmWrhT6o
- Virtual Manipulatives and Games: http://nlvm.usu.edu/en/nav/topic_t_1.html
- Ten Frame games from NCTM: https://www.nctm.org/Classroom-Resources/Illuminations/Interactives/Ten-Frame/
- Interactive Number Chart: http://www.abcya.com/interactive_100_number_chart.htm
- Base Ten Bingo (select ones and tens only): http://www.abcya.com/base_ten_bingo.htm
- Marble Math Addition: http://www.abcya.com/addition.htm
- Balloon Pop Subtraction: http://www.abcya.com/subtraction_game.htm
- Math Lines Addition (select any number up to ten as the target number): http://www.abcya.com/math_lines_addition.htm
- Fun 4 The Brain Addition Games: http://www.fun4thebrain.com/addition.html
- Arithmetic Baseball: http://www.funbrain.com/math/index.html

Morning Meeting Activities:

- Using a Calendar
- Tracking the Days of School by Building a Number Line
- True or False?
- Make a Match
- Think Fast! with Pinch Cards
- Count to Today's Number
- What's Missing?
- Find My Number
- Think Fast! with Dominoes
- Data Review
- Think Fast! with Base Ten Drawings
- Think Fast! with Clock Cards

Unit 4: Working with the Number System, Fractions, Time, Measurement, and Shapes [Pacing: 46 Days]

Why Is This Unit Important?

In this unit, students delve into the concept of fractions by partitioning circles and rectangles into two or four equal shares and build foundational skills of describing equal shares with words and proper notation for writing fractions as numbers. Students continue their study of telling time, applying what they've learned about "halves" to understand telling time to the half hour. Students explore measurement with nonstandard units to build conceptual understanding of length and proper measurement techniques. Students return to their previous work with the number system as they decompose numbers to add and subtract and extend this work to two-digit numbers, reinforcing place value concepts studied earlier in the year. To conclude the unit, students work with shapes and solids to explore and use defining attributes.

The big ideas embedded in this unit are:

- Our number system is structured around base ten.
- Objects may be partitioned into equal shares, and we describe these equal shares as fractions.
- Time can be measured using clocks.
- Length is an attribute of an object that can be measured using multiple iterations of an object.
- Shapes are figures that take up space in two dimensions and solids are objects that take up space in three dimensions. Shapes and solids may be described, identified, and classified by their defining attributes.

Enduring Understandings:

- Understand that circles and rectangles may be partitioned into equal shares, and those shares are described with specific words and written with specific notation
- Understand that a whole can be described as the total of its' fractional parts
- Understand that there is more than one way to partition a whole into halves or fourths
- Understand that partitioning a whole into more equal shares results in those shares being of smaller size
- Understand that time can be measured using a clock, and that we use these measurements for a variety of reasons
- Understand that time can be described by noting the hour and how many minutes have passed since that hour occurred
- Understand that addends and subtrahends may be decomposed into different parts in order to solve a larger problem, which allows one to use what is known about one number relationship to solve another

- Understand that length is an attribute of an object that can be measured using multiple iterations of an object
- Understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps
- Understand that the size of the measuring unit will determine how many units are needed to measure the object's length; a smaller unit will result in more units needed, and larger units will require fewer units to measure the same object
- Understand that our number system uses place value of tens and ones, and we can use that structure to identify number relationships
- Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; sometimes it is necessary to compose a ten.
- Understand that in subtracting two-digit numbers, one subtracts tens from tens, ones from ones.
- Understand that two-dimensional shapes and three-dimensional solids may be described, sorted, and classified by their attributes.
- Understand the difference between defining and non-defining attributes of shapes and solids.

Essential Questions:

- How can we describe and represent this whole and how it has been partitioned?
- How do we use a clock to tell time?
- How can we use tools to represent the relationship between these numbers?
- How can we use what we know about the relationship between these numbers to help us understand and solve related problems?
- How can we use objects to measure the length of an object?
- How can we use what we know about place value to solve problems?
- How can we describe the attributes of shapes and solids?
- How can we identify, sort, and classify shapes and solids by their attributes?

Acquired Knowledge:

- Objects can be partitioned into equal shares and those shares are called fractions
- A partitioned object can be described by its fractions, and when all of the partitions are composed it results in a whole
- Decomposing a whole into more equal shares creates smaller shares
- An analog clock measures hours and minutes, represented by numbers and lines
- There are 60 minutes in an hour; there are 60 lines around the clock and the space between each line represents a measure of one minute; there are 5 minutes between each number on the clock
- A "half hour" is 30 minutes, and is determined by the minute hand passing halfway around the clock from the 12 to the 6

- Times to the half hour are noted with the hour, a colon, and then the minutes noted as 30
- Decomposing an addend or a subtrahend is a strategy used to solve unknown problems using what is already known
- The length of an item can be measured in units (standard or nonstandard) that are arranged along the entire length with no gaps and no overlaps
- Ten ones have the same value as one ten; this applies to two-digit numbers as well (i.e., two tens and ten ones has the same value as three tens)
- When adding two-digit numbers, one adds tens with tens and ones with ones; sometimes it is necessary to compose a ten
- When subtracting, one also subtracts tens from tens and ones from ones
- Shapes are objects that take up space in two-dimensions
- Some attributes are defining (e.g., all triangles are closed and three-sided) and others are non-defining (e.g., color, orientation, overall size)
- Shapes may be sorted or classified based on their defining attributes

Acquired Skills:

- Partition circles and rectangles into two or four equal shares
- Identify equal shares as fractions, describe those fractions using proper vocabulary (i.e., halves, fourths, quarters), and record those fractions using proper notation (i.e., ½, ¼)
- Describe a whole as being made up of all of its partitions (i.e., two halves)
- Tell time to the hour or half-hour, using an analog or digital clock
- Describe the time to the hour or half hour in words (i.e., one o'clock, one thirty, half past one)
- Write the time to the hour or half hour using proper notation (i.e., 1:00, 1:30)
- Use strategies for fluency based on decomposing an addend such as "making ten"; i.e., solving 7 + 5 by recognizing a known "ten buddy" fact of 7 + 3 = 10, the addend 5 may be decomposed into a 3 and 2, therefore 7 + 5 = 7 + 3 + 2 = 10 + 2 = 12, and representing this with objects, drawings, ten frames, or number lines
- Use strategies for subtracting within 20 using a strategy based on decomposing the subtrahend such as "decomposing a number leading to a ten"; i.e., solving 14 – 5 by recognizing that 14 is 4 larger than 10, that 5 may be decomposed into a 4 and 1, therefore 14 – 5 = 14 – 4 – 1 = 10 – 1 = 9, and representing his with objects, drawings, ten frames, or number lines
- Express the length of an object as a number of length units, by laying multiple copies of a shorter object end-to-end with no gaps and no overlaps.
- Order objects by length
- Compare the lengths of two objects by using a third object
- Add a two-digit number and a one-digit number, using objects, drawings, and strategies based on place value; compose a ten as needed
- Add a two-digit number and a multiple of ten, using objects, drawings, and strategies based on place value

- Recognize that adding a value in its entirety or a decomposed state will result in the same sum (i.e., 28 + 30 = 28 + 10 + 10 + 10)
- Subtract multiples of ten in the range 10 – 90 from multiples of ten in the range 10 – 90, using objects, drawings, and strategies based on place value
- Identify and describe defining and non-defining attributes of shapes and solids
- Sort two-dimensional shapes and three-dimensional solids by their defining attributes
- Build and draw shapes to possess defining attributes
- Solve "add to", "take from", "put together/take apart", and "compare" story problems with the unknown in any position
- Identify equations as true or false
- Identify a missing value in a given equation
- Interpret data with up to 3 categories, and answer questions about the data

Instructional Materials:

- Quarter 4 Math Module
- Investigations in Number, Data and Space for the Common Core Education, Pearson Education, Inc.
- Investigations in Number, Data and Space, Manipulatives Kit for Grade 1
- Investigations in Number, Data and Space, Cards Package for Grade 1
- Baby Steps Cards (for measuring)
- Base Ten manipulatives
- Basketball Player Steps Cards (for measuring)
- Chart paper
- Classroom calendar
- Clock—large classroom demonstration clock
- Clocks—student demonstration clocks
- Color tiles
- Connecting cubes
- Craft sticks
- Decahedron dice
- Digi-blocks
- Dot cubes (six-sided dice)
- Fish Cards—Sets 1, 2, and 3 (for measuring)
- Geoblocks
- *Give Me Half!* by Stuart J. Murphy
- *How Big is a Foot?* by Rolf Myller
- Hundred chart
- Number Lines
- Pattern blocks
- Primary Rulers
- Ten-frames
- Two-color counters

Differentiation:

Enrichments:

- Place Value Pictures
- Add the Ends Dominos
- Length Hunt
- Mystery Shape
- Square It
- Clothesline Math—Addition within Twenty
- Clothesline Math—Adding and Subtracting Ten
- Selected problems from the "Problem-Solving Bank"

Supplements:

- Place Value Fold & Unfold
- Place Value Target
- Scooping Cubes for Measurement
- Clothesline Math—Numerals
- Clothesline Math—Base Ten Models
- Clothesline Math—Addition within Ten
- Clothesline Math—Subtraction within Ten
- Selected Problems from the "Problem-Solving Bank"

Assessments:

Formative Assessments:

- Teacher's observation of students at work; anecdotal records
- Individual conferences and group discussions
- Students' recording sheets
- Exit Tickets

Summative Assessments:

- Teacher's observation of students at work
- Individual conferences
- Show What You Know cards
- Q4 Assessment

Benchmarks

- Quarterly Mathematics Assessments

Alternative Assessments:

- Modified tasks and assessment rubrics
- Performance-based assessment tasks

List of Applicable New Jersey State Standards for Mathematics Covered in This Unit:

- NJSLS.1.OA.A.1
- NJSLS.1.OA.A.2
- NJSLS.1.OA.B.3
- NJSLS.1.OA.B.4
- NJSLS.1.OA.C.5
- NJSLS.1.OA.C.6
- NJSLS.1.OA.D.7
- NJSLS.1.OA.D.8
- NJSLS.1.NBT.A.1
- NJSLS.1.NBT.B.2
- NJSLS.1.NBT.B.3
- NJSLS.1.NBT.C.4
- NJSLS.1.NBT.C.5
- NJSLS.1.NBT.C.6
- NJSLS.1.MD.A.1
- NJSLS.1.MD.A.2
- NJSLS.1.MD.B.3
- NJSLS.1.MD.C.4
- NJSLS.1.G.A.1
- NJSLS.1.G.A.2
- NJSLS.1.G.A.3
- NJSLS.MP 1-8

Suggested Learning Experiences and Instructional Activities:

- Fractions
- Telling Time to the Half Hour
- Subtracting Strategy: Decomposing to Ten
- Measurement
- Adding 2-Digit + 1-Digit Numbers
- Adding 2-Digit Numbers + Multiples of Ten
- Subtracting Multiples of 10 from Multiples of Ten
- Shapes

Technology:

- "Sharing Cookies": https://youtu.be/KTFJ9gjfAXg
- "Give Me Half!": https://youtu.be/hVaxiJB6Fls
- Interactive Demonstration Clock: https://www.visnos.com/demos/clock
- "Telling Time to the Half Hour": https://youtu.be/n_daAYx6krg
- "Introduction to Non-Standard Measurement for Kids: Using Paper Clips to Measure": https://youtu.be/q8o7n-A0SC0
- "Super Fab Lab! Nonstandard Measurement—Sid the Science Kid—The Jim Henson Company": https://youtu.be/-aU0f6ajtJE

- "The King's Foot": https://youtu.be/HDLeVHEHMpI
- *Shapes* software from *Investigations*; on CD-ROM or in computer labs
- Virtual Manipulatives and Games: http://nlvm.usu.edu/en/nav/topic_t_1.html
- Interactive Number Chart: http://www.abcya.com/interactive_100_number_chart.htm
- Base Ten Bingo (select ones and tens only): http://www.abcya.com/base_ten_bingo.htm
- Guess the Number: http://www.abcya.com/guess_the_number.htm
- Math Facts Basketball (select easy or medium, + or -): http://www.abcya.com/math_facts_game.htm
- Math Lines Addition (select any number up to ten as the target number): http://www.abcya.com/math_lines_addition.htm
- Fun 4 The Brain Addition Games: http://www.fun4thebrain.com/addition.html
- Arithmetic Baseball: http://www.funbrain.com/math/index.html

Morning Meeting Activities:

- Using a Calendar
- Tracking the Days of School by Building a Number Line
- Think Fast! with Clock Cards
- True or False?
- What's Missing?
- Think Fast! with Clock Cards
- Build, Slide, Add
- Think Fast! with Pinch Cards
- Story Problems
- Draw It!
- Secret Number
- Data Review
- Is It a Triangle?

Sample Standards Integration

21st Century Skills & Career Readiness Practices

CRP4. Communicate clearly and effectively and with reason.

For example, in Unit 4 students will justify if they agree or disagree with the statement that 28 + 30 is the same as 28 + 10 + 10 + 10.

CRP6. Demonstrate creativity and innovation.

For example, in Unit 4 students will create shapes and solids by combining other shapes and solids and describe their creations.

CRP7. Employ valid and reliable research strategies.

For example, in Unit 1 students will select a question and gather data from the class; they will organize and represent the data and describe what they've learned about their classmates from the data set.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

For example, in Unit 2 students will work to solve and understand the connection between problems in which the result is unknown, the change is unknown, or the start is unknown.

CRP12. Work productively in teams while using cultural global competence.

For example, in Unit 1 students will work in small teams to design a survey question, gather data, and present the findings.

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 create and communicate knowledge.

For example, in Unit 4 students will access, manage, evaluate, and synthesize information to develop models for geometric shapes and their manipulation.

Interdisciplinary Connections

NJSLS.RI.1.1. Ask and answer questions about key details in a text.

NJSLS.RI.1.2. Identify the main topic and retell key details of a text.

NJSLS.RI.1.4. Ask and answer questions to help determine or clarify the meaning of words and phrases in a text.

NJSLS.RI.1.6. Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.

NJSLS.RI.1.7. Use the illustrations and details in a text to describe its key ideas.

These standards are met throughout the course. For example, in Unit 3 students will read stories such as *Five Little Monkeys Jumping on the Bed* and *Ten Little Ladybugs* to explore concepts of addition and subtraction. Students will also use the story *Two of Everything* to delve into the concept of doubling.

NJSLS.SL.1.1. Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers and adults in small and larger groups.

- **A. Follow agreed-upon norms for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).**
- **B. Build on others' talk in conversations by responding to the comments of others through multiple exchanges.**
- **C. Ask questions to clear up any confusion about the topics and texts under discussion.**

NJSLS.SL.1.2. Ask and answer questions about key details in a text read aloud or information presented orally or through other media.

NJSLS.SL.1.5. Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.

These standards are met throughout the course. For example, in Unit 2 students will discuss their solutions to a variety of story problems, listen to classmates' explanations, establish norms about math discussions, and work to develop conversation skills in responding to and building upon others' math ideas. In Units 3 and 4, students will ask and answer questions about information presented in various media, including videos about adding ten, time, fractions, and measurement.