INTRODUCTION

The Mathematics Curriculum Maps that follow have a two-fold purpose for educators in the Roosevelt School District. First and foremost, the maps serve as a resource to help teachers and instructional leaders develop an understanding of what it is students are expected to know and do as it relates to the learning standards. Secondly, the maps serve as a guide for teachers to use when planning for instruction that is purposefully designed to maximize student learning.

The implementation of new academic standards is occurring across the nation to help students become college and career ready. The AZ College and Career Ready Standards cited in our curriculum maps are designed to be more focused and coherent in order to improve mathematics achievement. The purpose of the new standards, developed under the Common Core initiative, is to bring about greater clarity and specificity in a learning progression aimed at developing students’ conceptual understanding of key ideas.

Special thanks go out to educators in the Roosevelt School District who dedicated their time to developing these district maps. The work of the team entailed poring over multiple documents shared by the Arizona Department of Education and the Common Core initiative to unwrap the standards, to determine what the essential understandings are for our students, to develop guiding questions, and to cite examples or explanations for what the standards may look like in the classroom. Special acknowledgement goes out to both ADE and the Common Core for the examples and explanations included in each map. For additional information or ideas on the AZ College and Career Ready Standards, visit the following links:

http://www.corestandards.org/the-standards/mathematics
http://commoncoretools.wordpress.com/
http://math.arizona.edu/~ime/progressions/

Our goal is to support teachers and instructional leaders with the implementation of the standards. If you ever have any questions regarding the standards or would like to send us your feedback, please call or email – we would love to hear from you!

Roosevelt School District
Curriculum and Assessment Department

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Grade 1

Overview

Operations and Algebraic Thinking (OA)

- Represent and solve problems involving addition and subtraction.
- Understand and apply properties of operations and the relationship between addition and subtraction.
- Add and subtract within 20.
- Work with addition and subtraction equations.

Number and Operations in Base Ten (NBT)

- Extend the counting sequence.
- Understand place value.
- Use place value understanding and properties of operations to add and subtract.

Measurement and Data (MD)

- Measure lengths indirectly and by iterating length units.
  - Tell and write time.
  - Represent and interpret data.

Geometry (G)

- Reason with shapes and their attributes.

Mathematical Practices (MP)

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.

KEY:  ○ Major Cluster  ● Supporting Cluster  ○ Additional Cluster
Critical Ideas in First Grade

In Grade 1, instructional time should focus on four critical areas: (1) developing understanding of addition, subtraction, and strategies for addition and subtraction within 20; (2) developing understanding of whole number relationships and place value, including grouping in tens and ones; (3) developing understanding of linear measurement and measuring lengths as iterating length units; and (4) reasoning about attributes of, and composing and decomposing geometric shapes.

(1) Students develop strategies for adding and subtracting whole numbers based on their prior work with small numbers. They use a variety of models, including discrete objects and length-based models (e.g., cubes connected to form lengths), to model add-to, take-from, put-together, take-apart, and compare situations to develop meaning for the operations of addition and subtraction, and to develop strategies to solve arithmetic problems with these operations. Students understand connections between counting and addition and subtraction (e.g., adding two is the same as counting on two). They use properties of addition to add whole numbers and to create and use increasingly sophisticated strategies based on these properties (e.g., “making tens”) to solve addition and subtraction problems within 20. By comparing a variety of solution strategies, children build their understanding of the relationship between addition and subtraction.

(2) Students develop, discuss, and use efficient, accurate, and generalizable methods to add within 100 and subtract multiples of 10. They compare whole numbers (at least to 100) to develop understanding of and solve problems involving their relative sizes. They think of whole numbers between 10 and 100 in terms of tens and ones (especially recognizing the numbers 11 to 19 as composed of a ten and some ones). Through activities that build number sense, they understand the order of the counting numbers and their relative magnitudes.

(3) Students develop an understanding of the meaning and processes of measurement, including underlying concepts such as iterating (the mental activity of building up the length of an object with equal-sized units) and the transitivity principle for indirect measurement. (Students should apply the principle of transitivity of measurement to make indirect comparisons, but they need not use this technical term.)

(4) Students compose and decompose plane or solid figures (e.g., put two triangles together to make a quadrilateral) and build understanding of part-whole relationships as well as the properties of the original and composite shapes. As they combine shapes, they recognize them from different perspectives and orientations, describe their geometric attributes, and determine how they are alike and different, to develop the background for measurement and for initial understandings of properties such as congruence and symmetry.
## Roosevelt School District
### Quarterly Pacing

<table>
<thead>
<tr>
<th>(OA) Operations and Algebraic Thinking</th>
<th>(NBT) Number and Operations in Base Ten</th>
<th>(MD) Measurement and Data</th>
<th>(G) Geometry</th>
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# Mathematical Practices – First Grade

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<th>Standards</th>
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<tr>
<td><strong>Students are expected to:</strong></td>
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<tr>
<td><strong>1.MP.1.</strong> Make sense of problems and persevere in solving them.</td>
<td>In first grade, students realize that doing mathematics involves solving problems and discussing how they solved them. Students explain to themselves the meaning of a problem and look for ways to solve it. Younger students may use concrete objects or pictures to help them conceptualize and solve problems. They may check their thinking by asking themselves, “Does this make sense?” They are willing to try other approaches.</td>
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<td><strong>1.MP.2.</strong> Reason abstractly and quantitatively.</td>
<td>Younger students recognize that a number represents a specific quantity. They connect the quantity to written symbols. Quantitative reasoning entails creating a representation of a problem while attending to the meanings of the quantities.</td>
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<td><strong>1.MP.3.</strong> Construct viable arguments and critique the reasoning of others.</td>
<td>First graders construct arguments using concrete referents, such as objects, pictures, drawings, and actions. They also practice their mathematical communication skills as they participate in mathematical discussions involving questions like “How did you get that?” “Explain your thinking,” and “Why is that true?” They not only explain their own thinking, but listen to others’ explanations. They decide if the explanations make sense and ask questions.</td>
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<td><strong>1.MP.4.</strong> Model with mathematics.</td>
<td>In early grades, students 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 opportunities to connect the different representations and explain the connections. They should be able to use all of these representations as needed.</td>
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<td><strong>1.MP.5.</strong> Use appropriate tools strategically.</td>
<td>In first grade, students begin to consider the available tools (including estimation) when solving a mathematical problem and decide when certain tools might be helpful. For instance, first graders decide it might be best to use colored chips to model an addition problem.</td>
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<td><strong>1.MP.6.</strong> Attend to precision.</td>
<td>As young children begin to develop their mathematical communication skills, they try to use clear and precise language in their discussions with others and when they explain their own reasoning.</td>
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<td><strong>1.MP.7.</strong> Look for and make use of structure.</td>
<td>First graders begin to discern a pattern or structure. For instance, if students recognize $12 + 3 = 15$, then they also know $3 + 12 = 15$. <em>(Commutative property of addition.)</em> To add $4 + 6 + 4$, the first two numbers can be added to make a ten, so $4 + 6 + 4 = 10 + 4 = 14$.</td>
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<tr>
<td><strong>1.MP.8.</strong> Look for and express regularity in repeated reasoning.</td>
<td>In the early grades, students notice repetitive actions in counting and computation, etc. When children have multiple opportunities to add and subtract “ten” and multiples of “ten” they notice the pattern and gain a better understanding of place value. Students continually check their work by asking themselves, “Does this make sense?”</td>
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Using the Curriculum Maps

The District’s curriculum maps are designed to guide teachers through the instructional planning process. Information in Stage 1 reflects desired learning outcomes for students within a particular topic and time frame.

In Stage 2, teachers develop an assessment plan to monitor student progress toward learning the desired skills and concepts established in Stage 1. In addition, the plan outlines the evidence teachers will collect to determine the depth of understanding their students have gained.

Stage 3 is designed for teachers to look ahead and plan student learning experiences over a specified period of time. At this point, teachers analyze the desired results and the evidence that will be collected to create a road map of daily learning objectives. Stage 3 is intended to serve as a catalyst to daily lesson planning; however, it does not take the place of the traditional lesson plans created by teachers.

Daily lesson plans will be an extension of the work with curriculum maps. Daily plans include the details necessary for successful instructional design and delivery (i.e., objectives, materials, strategies, resources, etc.).

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**Stage 1**

*Identify Desired Results*

- Enduring Understandings → Big Ideas →
  - Guiding Questions →
  - Skills and Knowledge

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**Stage 2**

*Determine Acceptable Evidence (Design Balanced Assessments)*

(To assess student progress toward desired results)

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**Stage 3**

*Plan Learning Experiences and Instruction*

(to support student success on assessments, leading to desired results)
### STAGE 2 – Assessment Evidence

<table>
<thead>
<tr>
<th>Summative Measures:</th>
<th>Formative Measures (both formal and/or informal)</th>
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### STAGE 3 – Learning Plan

**Daily Objectives and/or Tasks:**

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### Roosevelt School District
First Grade - Curriculum Map – Mathematics

<table>
<thead>
<tr>
<th>Topic</th>
<th>Addition to 10</th>
<th>Quarter</th>
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<tr>
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#### STAGE 1 – Desired Results

**Standards:**

1.OA.A.1. **Use addition and subtraction within 20** to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (*RSD: within 10 in Q1)

1.OA.B.3. **Apply properties of operations as strategies to add and subtract**.

1.OA.C.5. **Relate counting to addition and subtraction** (e.g., by counting on 2 to add 2).

1.OA.C.6. **Add and subtract within 20**, demonstrating fluency for addition and subtraction within 10. (*within 10 in Q1)

1.OA.D.7. **Understand the meaning of the equal sign**, and determine if equations involving addition and subtraction are true or false.

1.OA.D.8. **Determine the unknown whole number in an addition or subtraction equation relating three whole numbers**.

**Mathematical Practices:**

1.MP.1. **Make sense of problems and persevere in solving them**.

1.MP.2. **Reason abstractly and quantitatively**.

1.MP.4. **Model with mathematics**.

1.MP.5. **Use appropriate tools strategically**.

1.MP.6. **Attend to precision**.

1.MP.7. **Look for and make use of structure**.

1.MP.8. **Look for and express regularity in repeated reasoning**.

**Guiding Questions:**

- What happens when we join two quantities?
- How can we find a total?
- What does it mean to be equal?
- What questions can be answered using addition?
- How is counting related to addition?
- What happens when we change the order of quantities when we add?

**Enduring Understandings:**

- Addition problems represent adding on to a group, combining groups, or joining parts to make a whole.
- The relationship of numbers to five and ten are useful in thinking about various combinations of numbers.

#### Students will know…….

- Addition number sentences can be used to show parts of a whole when combining two groups or adding on.
- Numbers can be added in any order (commutative property) and the result remains the same.
- Adding zero to a number does not change that number (identity property of addition).
- The equal sign means that the quantities on both sides are the same.

#### Students will be able to…….

- Compose and decompose numbers up to 10 in different ways.
- Use a variety of strategies to solve addition problems. (Strategies: count on, make 5, doubles, doubles +1)
- Solve real-life addition word problems up to 10 using objects, drawings, and equations. (Problem types: add to result unknown, put together result unknown, and add to change unknown)
- Solve addition number sentences up to 10.
- Determine a missing addend in a number sentence.
- Determine if addition equations are true or false.

**Instructional Resources:**

- EngageNY Module 1 Topics A-F
- enVisionMATH Topics 3 and 5

**Academic Vocabulary:**

- add
- plus
- sum
- equal
- addend / part
- total / whole
- 5 group
- number path
- number bond
- expression
- number sentence
- equation

**Common Errors/Misconceptions:**

Many children misunderstand the meaning of the equal sign. The equal sign mean “is the same as” but most primary students believe the equal sign tells you that the “answer is coming up” to the right of the equal sign. This misconception is over-generalized by only seeing examples of number sentences with an operation to the left of the equal sign and the answer on the right. First graders need to see equations written multiple ways, for example 5 + 7 = 12 & 12 = 5 + 7.
A second misconception that many students have is that it is valid to assume that a key word or phrase in a problem suggests the same operation will be used every time. For example, they might assume that the word left always means that subtraction must be used to find a solution. Providing problems in which key words like this are used to represent different operations is essential. Students need to analyze word problems and avoid using key words to solve them.

**Examples and/or Explanations:** For problem types see Table 1 (page 15)

1.OA.A.1 Contextual problems that are closely connected to students’ lives should be used to develop fluency with addition and subtraction. Table 1 describes the four different addition and subtraction situations and their relationship to the position of the unknown.

1.OA.B.3 Students should understand the important ideas of the following properties:
- Identity property of addition (e.g., 6 = 6 + 0)
- Commutative property of addition (e.g., 4 + 5 = 5 + 4)
- Associative property of addition (e.g., 3 + 9 + 1 = 3 + 10 = 13)

1.OA.C.5 Students’ multiple experiences with counting may hinder their understanding of counting on and counting back as connected to addition and subtraction. To help them make these connections when students count on 3 from 4, they should write this as 4 + 3 = 7. When students count back (3) from 7, they should connect this to 7 – 3 = 4. Students often have difficulty knowing where to begin their count when counting backward.

1.OA.C.6 Adding and subtracting fluently is strongly connected to all the standards in the Operations and Algebraic Thinking Domain. By studying patterns and relationships in addition facts and relating addition and subtraction, students build a foundation for fluency with addition and subtraction facts. Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently. The use of objects, diagrams, or interactive whiteboards and various strategies will help students develop fluency.

1.OA.D.7 Interchanging the language of “equal to” and “the same as” as well as “not equal to” and “not the same as” will help students grasp the meaning of the equal sign. Students should understand that “equality” means “the same quantity as”. In order for students to avoid the common pitfall that the equal sign means “to do something” or that the equal sign means “the answer is,” they need to be able to:
- Express their understanding of the meaning of the equal sign
- Accept sentences other than a + b = c as true (a = a, c = a + b, a = a + 0, a + b = b + a)
- Know that the equal sign represents a relationship between two equal quantities
- Compare expressions without calculating

These key skills are hierarchical in nature and need to be developed over time. Experiences determining if equations are true or false help student develop these skills. Initially, students develop an understanding of the meaning of equality using models. However, the goal is for students to reason at a more abstract level. At all times students should justify their answers, make conjectures (e.g., if you add a number and then subtract that same number, you always get zero), and make estimations.

Examples of true and false statements:
- 8 = 8
- 1 + 1 + 3 = 7
- 4 + 3 = 3 + 4
- 9 + 3 = 10

1.OA.D.8 Students need to understand the meaning of the equal sign and know that the quantity on one side of the equal sign must be the same quantity on the other side of the equal sign. They should be exposed to problems with the unknown in different positions. Having students create word problems for given equations will help them make sense of the equation and develop strategic thinking.

Examples of possible student “think-throughs”:
- 8 + ? = 11: “8 and some number is the same as 11. 8 and 2 is 10 and 1 more makes 11. So the answer is 3.”
- 5 = □ – 3: “This equation means I had some cookies and I ate 3 of them. Now I have 5. How many cookies did I have to start with? Since I have 5 left and I ate 3, I know I started with 8 because I count on from 5 . . . 6, 7, 8.”

Students may use a document camera or interactive whiteboard to display their strategies for solving the equations. This gives them the opportunity to communicate and justify their thinking.
Roosevelt School District
First Grade - Curriculum Map – Mathematics

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<th>Subtraction to 10</th>
<th>Quarter</th>
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STAGE 1 – Desired Results

Standards:
1.OA.A.1. Use addition and subtraction within 20* to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (*RSD: within 10 in Q1)
1.OA.B.3. Apply properties of operations as strategies to add and subtract.
1.OA.C.5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).
1.OA.C.6. Add and subtract within 20*, demonstrating fluency for addition and subtraction within 10. (*within 10 in Q1)
1.OA.D.8. Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.

Mathematical Practices:
1.MP.1. Make sense of problems and persevere in solving them.
1.MP.2. Reason abstractly and quantitatively.
1.MP.5. Use appropriate tools strategically.
1.MP.6. Attend to precision.
1.MP.7. Look for and make use of structure.
1.MP.8. Look for and express regularity in repeated reasoning.

Guiding Questions:
- What happens when we take one quantity from another?
- How can we find what is left when we take one quantity from another?
- What questions can be answered using subtraction?
- How is counting related to subtraction?
- What happens when we change the order of quantities when we subtract?

Enduring Understandings:
- Subtraction problems represent a missing part, a separating of objects from a whole, or comparing quantities.
- Addition and subtraction have an inverse relationship. This relationship can be used to find subtraction facts: every subtraction fact has a related addition fact.
- The relationship of numbers to five and ten are useful in thinking about various combinations of numbers.

Students will know.....
- Subtraction number sentences can be used to show a missing part situation, a separating from situation, or a comparison situation.
- Subtracting zero from a number does not change that number (Identity Property of Subtraction).

Students will be able to.....
- Compose and decompose numbers up to 10 in different ways.
- Solve real-life subtraction word problems within 10 using objects, drawings, and equations. (Problem Types: take from result unknown, take apart addend unknown, take from change unknown, and add to change unknown problems)
- Solve subtraction number sentences within 10.
- Determine a missing whole number in a subtraction equation.

Instructional Resources:
- EngageNY Module 1 Topics G-J
- enVisionMATH Topic 4

Academic Vocabulary:
- subtract
- minus
- difference
- part
- whole
- equal
- number sentence
- equation

Common Errors/Misconceptions:
A common misconception is that the commutative property applies to subtraction. After students have discovered and applied the commutative property for addition, ask them to investigate whether this property works for subtraction. Have students share and discuss their reasoning and guide them to conclude that the commutative property does not apply to subtraction.
Students also ignore the need for regrouping when subtracting and think that they should always subtract a smaller digit from a larger digit. For example, students may solve 15 - 7 by subtracting the 5 from the 7 to get the incorrect answer of 12. Students need to relate their understanding of place-value concepts and grouping in tens and ones to their steps for subtraction. They need to show these relationships using mathematical drawings, ten-frames or base-ten blocks.

**Examples and/or Explanations:** For problem types see Table 1 (page 15)

1.OA.A.1 Contextual problems that are closely connected to students' lives should be used to develop fluency with addition and subtraction. Table 1 describes the four different addition and subtraction situations and their relationship to the position of the unknown.

1.OA.B.3 Students should understand the important ideas of the following properties:
- Identity property of subtraction (e.g., 9 - 0 = 9)

Students need several experiences investigating whether the commutative property works with subtraction. The intent is not for students to experiment with negative numbers but only to recognize that taking 5 from 8 is not the same as taking 8 from 5. Students should recognize that they will be working with numbers later on that will allow them to subtract larger numbers from smaller numbers. However, in first grade we do not work with negative numbers.

1.OA.B.4 When determining the answer to a subtraction problem, 12 - 5, students think, “If I have 5, how many more do I need to make 12?” Encouraging students to record this symbolically, 5 + ? = 12, will develop their understanding of the relationship between addition and subtraction. Some strategies they may use are counting objects, creating drawings, counting up, using number lines or 10 frames to determine an answer.

1.OA.C.5 Students’ multiple experiences with counting may hinder their understanding of counting on and counting back as connected to addition and subtraction. To help them make these connections when students count on 3 from 4, they should write this as 4 + 3 = 7. When students count back (3) from 7, they should connect this to 7 - 3 = 4. Students often have difficulty knowing where to begin their count when counting backward.

1.OA.C.6 Adding and subtracting fluently is strongly connected to all the standards in the Operations and Algebraic Thinking Domain. By studying patterns and relationships in addition facts and relating addition and subtraction, students build a foundation for fluency with addition and subtraction facts. Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently. The use of objects, diagrams, or interactive whiteboards and various strategies will help students develop fluency.

1.OA.D.8 Students need to understand the meaning of the equal sign and know that the quantity on one side of the equal sign must be the same quantity on the other side of the equal sign. They should be exposed to problems with the unknown in different positions. Having students create word problems for given equations will help them make sense of the equation and develop strategic thinking.

Examples of possible student “think-throughs”:
- 5 = □ - 3: “This equation means I had some cookies and I ate 3 of them. Now I have 5. How many cookies did I have to start with? Since I have 5 left and I ate 3, I know I started with 8 because I count on from 5... 6, 7, 8.”
### Table 1 - Common Addition and Subtraction Situations*

<table>
<thead>
<tr>
<th></th>
<th>Result Unknown</th>
<th>Change Unknown</th>
<th>Start Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Add To</strong></td>
<td>Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now?</td>
<td>Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two?</td>
<td>Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before?</td>
</tr>
<tr>
<td></td>
<td>$2 + 3 = ?$</td>
<td>$2 + ? = 5$</td>
<td>$? + 3 = 5$</td>
</tr>
<tr>
<td><strong>Take From</strong></td>
<td>Five apples were on the table. I ate two apples. How many apples are on the table now?</td>
<td>Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat?</td>
<td>Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before?</td>
</tr>
<tr>
<td><strong>Total Unknown</strong></td>
<td>Three red apples and two green apples are on the table. How many apples are on the table?</td>
<td>Grandma has five flowers. How many can she put in her red vase and how many in her blue vase?</td>
<td>Five apples are on the table. Three are red and the rest are green. How many apples are green?</td>
</tr>
<tr>
<td></td>
<td>$3 + 2 = ?$</td>
<td>$5 = 0 + 5, 5 = 5 + 0$</td>
<td>$3 + ? = 5, 5 – 3 = ?$</td>
</tr>
<tr>
<td>*<em>Put Together <em>/ Take Apart</em></em></td>
<td><strong>Difference Unknown</strong></td>
<td><strong>Bigger Unknown</strong></td>
<td><strong>Smaller Unknown</strong></td>
</tr>
<tr>
<td><strong>Compare</strong></td>
<td>&quot;How many more?&quot; version: Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy?</td>
<td>&quot;More&quot; version suggests operation: Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have?</td>
<td>&quot;Fewer&quot; version suggests operation: Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have?</td>
</tr>
</tbody>
</table>

*Adapted from Mathematics Learning in Early Childhood, National Research Council, AZ Mathematics Standards, and Progressions for the CCSS in Mathematics*

Darker shading indicates the four Kindergarten problem subtypes. Grade 1 and 2 students work with all subtypes. Unshaded (white) problems are the four difficult subtypes that students should work with in Grade 1 but need not master until Grade 2.

1 These take apart situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help children understand that the = sign does not always mean makes or results in but always does mean is the same number as.

2 Either addend can be unknown, so there are three variations of these problem situations. Both Addends Unknown is a productive extension of this basic situation, especially for small numbers less than or equal to 10.
#### Roosevelt School District  
**First Grade - Curriculum Map – Mathematics**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Numbers Within 20</th>
<th>Quarter</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pacing</td>
<td>31 days</td>
<td>Sequence</td>
<td>1</td>
</tr>
</tbody>
</table>

## STAGE 1 – Desired Results

### Standards:
- **1.OA.A.1.** Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
- **1.OA.A.2.** Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
- **1.OA.B.3.** Apply properties of operations as strategies to add and subtract. (commutative and identity properties)
- **1.OA.B.4.** Understand subtraction as an unknown-addend problem.
- **1.OA.C.6.** Add and subtract within 20, demonstrating fluency for addition and subtraction within 10.
- **1.OA.D.7.** Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false.
- **1.NBT.B.2** Understand that the two digits of a two-digit number represent amounts of tens and ones.
  - a. 10 can be thought of as a bundle of ten ones — called a “ten.”
  - b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.

### Mathematical Practices:
- **1.MP.2.** Reason abstractly and quantitatively.
- **1.MP.3.** Construct viable arguments and critique the reasoning of others.
- **1.MP.4.** Model with mathematics.
- **1.MP.7.** Look for and make use of structure.
- **1.MP.8.** Look for and express regularity in repeated reasoning.

### Enduring Understandings:
- Addition problems represent adding on to a group, combining groups, or joining parts to make a whole.
- Subtraction problems represent a missing part, a separating of objects from a whole, or comparing quantities.
- Addition and subtraction have an inverse relationship. This relationship can be used to find subtraction facts: every subtraction fact has a related addition fact.
- The relationship of numbers to five and ten are useful in thinking about various combinations of numbers.

### Guiding Questions:
- How do you decide on the best strategy to use when adding or subtracting?
- What does it mean to be equal?
- What is the relationship between ones and tens?

### Students will know.....
- Numbers can be added in any order (commutative property) and the result remains the same.
- When adding 3 or more numbers, numbers can be grouped differently and the result (the sum) is the same (associative property).
- The equal sign means that the quantities on both sides are the same.
- The numbers 11-19 represent a ten and some ones.

### Students will be able to.....
- Use a variety of strategies to solve addition and subtraction problems. (Strategies: count on, make 5, make 10, take from 10)
- Solve real-life addition and subtraction word problems within 20 using objects, drawings, and equations. (Problem Types: put together total unknown, take from result unknown, take apart addend unknown, put together addend unknown, take from change unknown, and add to change unknown problems)
- Use the commutative and associative properties to add and subtract within 20.
- Determine if equations made up of addition and subtraction expressions are true or false.
- Identify and represent teen numbers as 1 ten and some ones.
- Compose and decompose numbers within 20.

### Instructional Resources:
- EngageNY Module 2
- enVisionMATH Topics 6, 7, 16, and 17
- enVisionMATH Topic 10 Lessons 10-1 and 10-2

### Academic Vocabulary:
- add / plus
- sum
- addend
- part
- whole
- equals
- tens
- ones
- minus / difference
- number bond
- expression
- equation
Common Errors/Misconceptions:

Many children misunderstand the meaning of the equal sign. The equal sign means — is the same as but most primary students believe the equal sign tells you that the — answer is coming up to the right of the equal sign. This misconception is over generalized by only seeing examples of number sentences with an operation to the left of the equal sign and the answer on the right. First graders need to see equations written multiple ways, for example 5 + 7 = 12 and 12 = 5 + 7.

A second misconception that many students have is that it is valid to assume that a key word or phrase in a problem suggests the same operation will be used every time. For example, they might assume that the word left always means that subtraction must be used to find a solution. Providing problems in which key words like this are used to represent different operations is essential. For example, the use of the word left in this problem does not indicate subtraction as a solution method: 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? Students need to analyze word problems and avoid using key words to solve them.

Examples and/or Explanations:

1.NBT.B.2 Understanding the concept of 10 is fundamental to children’s mathematical development. Students need multiple opportunities counting 10 objects and “bundling” them into one group of ten. They count between 10 and 20 objects and make a bundle of 10 with or without some left over (this will help students who find it difficult to write teen numbers).

As students are representing the various amounts, it is important that an emphasis is placed on the language associated with the quantity. For example, 53 should be expressed in multiple ways such as 53 ones or 5 groups of ten with 3 ones leftover. When students read numbers, they read them in standard form as well as using place value concepts. For example, 53 should be read as “fifty-three” as well as five tens, 3 ones.

Students may use the document camera or interactive whiteboard to demonstrate their “bundling” of objects. This gives them the opportunity to communicate their thinking.

1.OA.A.2. To further students’ understanding of the concept of addition, students create word problems with three addends. They can also increase their estimation skills by creating problems in which the sum is less than 5, 10 or 20. They use properties of operations and different strategies to find the sum of three whole numbers such as:

- Counting on and counting on again (e.g., to add 3 + 2 + 4 a student writes 3 + 2 + 4 = ? and thinks, “3, 4, 5, that’s 2 more, 6, 7, 8, 9 that’s 4 more so 3 + 2 + 4 = 9.”
- Making tens (e.g., 4 + 8 + 6 = 4 + 6 + 8 = 10 + 8 = 18)
- Using “plus 10, minus 1” to add 9 (e.g., 3 + 9 + 6 A student thinks, “9 is close to 10 so I am going to add 10 plus 3 plus 6 which gives me 19. Since I added 1 too many, I need to take 1 away so the answer is 18.)
- Decomposing numbers between 10 and 20 into 1 ten plus some ones to facilitate adding the ones
- Using doubles
- Using near doubles (e.g., 5 + 6 + 3 = 5 + 5 + 1 + 3 = 10 + 4 =14)

Students may use document cameras to display their combining strategies. This gives them the opportunity to communicate and justify their thinking.

1.OA.D.7 Interchanging the language of “equal to” and “the same as” as well as “not equal to” and “not the same as” will help students grasp the meaning of the equal sign. Students should understand that “equality” means “the same quantity as”. In order for students to avoid the common pitfall that the equal sign means “to do something” or that the equal sign means “the answer is,” they need to be able to:

- Express their understanding of the meaning of the equal sign
- Accept sentences other than a + b = c as true (a = a, c = a + b, a = a + 0, a + b = b + a)
- Know that the equal sign represents a relationship between two equal quantities
- Compare expressions without calculating

These key skills are hierarchical in nature and need to be developed over time. Experiences determining if equations are true or false help student develop these skills. Initially, students develop an understanding of the meaning of equality using models. However, the goal is for students to reason at a more abstract level. At all times students should justify their answers, make conjectures (e.g., if you add a number and then subtract that same number, you always get zero), and make estimations.

Examples of true and false statements:

- 7 = 8 – 1
- 6 = 1 + 6
- 12 + 2 = 12
- 5 + 3 = 10 – 2
### STAGE 1 – Desired Results

#### Standards:
1. **1.MD.A.1.** Order three objects by length; compare the lengths of two objects indirectly by using a third object.
2. **1.MD.A.2.** Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*
3. **1.MD.C.4.** Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.
4. **1.OA.A.1.** Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

#### Mathematical Practices:
1. **1.MP.2.** Reason abstractly and quantitatively.
2. **1.MP.3.** Construct viable arguments and critique the reasoning of others.
3. **1.MP.4.** Model with mathematics.
4. **1.MP.5.** Use appropriate tools strategically.
5. **1.MP.6.** Attend to precision.
6. **1.MP.7.** Look for and make use of structure.

#### Enduring Understandings:
- Objects can be compared and ordered by length.
- Different units can be used to measure length.
- Data can be represented in different ways.
- Terms such as more than, less than, and equal to (the same as) are used to compare quantities.

#### Guiding Questions:
- How can we tell when one object is longer than another?
- How can we order by length?
- Why is it important to lay the units end to end when measuring an object?
- How are objects used to measure other objects?
- How do graphs help us answer questions and solve problems?

#### Students will know.....
- The length of an object is the number of same-size units that span the object with no gaps or overlaps.
- Graphs can be used to represent and compare the number of objects in multiple groups.

#### Students will be able to.....
- Determine an appropriate non-standard unit for measuring an object.
- Compare objects directly describing their relationship using terms such as longer, shorter, longest, shortest, etc.
- Compare objects indirectly describing their relationship using terms such as longer, shorter, longest, shortest, etc.
- Order three objects by length.
- Measure objects using non-standard units with no gaps or overlaps.
- Ask questions about a set of data.
- Use graphs with up to three categories to determine and/or compare quantities of objects using addition and subtraction within 20.
- Make graphs to represent quantities of objects with up to three categories.

#### Instructional Resources:
- EngageNY Module 3
- enVisionMATH Topic 14 Lessons 14-1 and 14-2
- enVisionMATH Topic 18 Lessons 1, 2, and 5-7

#### Academic Vocabulary:
- measure
- length
- unit
- compare
- longer/longest
- shorter/shortest
- more/less than
- same as
- graph
tally chart
Common Errors/Misconceptions:
When using a ruler or determining length from a drawing/picture, students may count the markings rather than the spaces between the markings.

Examples and/or Explanations:

1.MD.A.1. In order for students to be able to compare objects, students need to understand that length is measured from one end point to another end point. They determine which of two objects is longer, by physically aligning the objects. Typical language of length includes taller, shorter, longer, and higher. When students use bigger or smaller as a comparison, they should explain what they mean by the word. Some objects may have more than one measurement of length, so students identify the length they are measuring. Both the length and the width of an object are measurements of length.

Examples for ordering:
- Order three students by their height
- Order pencils, crayons, and/or markers by length
- Build three towers (with cubes) and order them from shortest to tallest
- Three students each draw one line, then order the lines from longest to shortest

Example for comparing indirectly:
- Two students each make a dough “snake.” Given a tower of cubes, each student compares his/her snake to the tower. Then students make statements such as, “My snake is longer than the cube tower and your snake is shorter than the cube tower. So, my snake is longer than your snake.”

1.MD.A.2. Students use their counting skills while measuring with non-standard units. While this standard limits measurement to whole numbers of length, in a natural environment, not all objects will measure to an exact whole unit. When students determine that the length of a pencil is six to seven paperclips long, they can state that it is about six paperclips long.

1.MD.C.4. Students create object graphs and tally charts 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.

Counting objects should be reinforced when collecting, representing, and interpreting data. Students describe the object graphs and tally charts they create. They should also ask and answer questions based on these charts or graphs that reinforce other mathematics concepts such as sorting and comparing. The data chosen or questions asked give students opportunities to reinforce their understanding of place value, identifying ten more and ten less, relating counting to addition and subtraction and using comparative language and symbols.

Students may use an interactive whiteboard to place objects onto a graph. This gives them the opportunity to communicate and justify their thinking.
### Roosevelt School District
First Grade - Curriculum Map – Mathematics

<table>
<thead>
<tr>
<th>Topic</th>
<th>Place Value and Addition &amp; Subtraction to 40</th>
<th>Quarter</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pacing</td>
<td>7 weeks</td>
<td>Sequence</td>
<td>1</td>
</tr>
</tbody>
</table>

#### STAGE 1 – Desired Results

**Standards:**

1.OA.A.1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

1.NBT.A.1. Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

1.NBT.B.2 Understand that the two digits of a two-digit number represent amounts of tens and ones.

1.NBT.B.3. Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

1.NBT.C.4. Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

1.NBT.C.5. Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

1.NBT.C.6. Subtract multiples of 10 in the range 10–90 from multiples of 10 in the range 10–90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

**Mathematical Practices:**

1.MP.3. Construct viable arguments and critique the reasoning of others.

1.MP.5. Use appropriate tools strategically.

1.MP.6. Attend to precision.

1.MP.7. Look for and make use of structure.

**Enduring Understandings:**

- The decade numbers are built on groups of ten.
- Place value can be used to compare and order numbers.
- Some problems can be solved by identifying elements that repeat in a predictable way.

**Guiding Questions:**

- What is the relationship between ones and tens?
- How does place value make use of patterns?
- How can we use place value to compare numbers?

**Students will know…..**

- The numbers 10, 20, 30…90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).
- The digits in two-digit numbers represent the amount of tens and ones.

**Students will be able to…..**

- Count to 120 starting from any number less than 120.
- Read and write numbers to 120.
- Represent a quantity of objects with a written numeral.
- Compare 2 two-digit numbers using the symbols >, =, and <.
- Mentally find 10 more or 10 less than a given two-digit number.
- Add within 40 using objects, drawing, properties of operations, and strategies based on place value.
- Subtract multiples of 10 from multiples of 10 in the range of 10–90 using objects and drawings.
- Relate addition and subtraction strategies to a written method.
- Solve real-life addition and subtraction word problems within 20 using tape diagrams and equations. (Problem Types: put together/take apart total unknown, take from result unknown, put together/take apart addend unknown, add to result unknown, add to change unknown, and add to start unknown problems)
- Explain the reasoning used to solve addition and subtraction problems.

**Instructional Resources:**

- EngageNY Module 4
- enVisionMATH Topics 10, 1-2, 11, 12, 20 1-4

**Academic Vocabulary:**

- place value
- digit
- ones
- tens
- compare
- less than (<)
- greater than (>)
- equal to (=)
Common Errors/Misconceptions:

Often when students learn to use an aid (Pac Man, bird, alligator, etc.) for knowing which comparison sign (<, >, = ) to use, the students don’t associate the real meaning and name with the sign. The use of the learning aids must be accompanied by the connection to the names: < Less Than, > Greater Than, and = Equal To. More importantly, students need to begin to develop the understanding of what it means for one number to be greater than another. In Grade 1, it means that this number has more tens, or the same number of tens, but with more ones, making it greater. Additionally, the symbols are shortcuts for writing down this relationship. Finally, students need to begin to understand that both inequality symbols (<, >) can create true statements about any two numbers where one is greater/smaller than the other, (15 < 28 and 28 >15).

Examples and/or Explanations:

1.NBT.A.1 Students use objects, words, and/or symbols to express their understanding of numbers. They extend their counting beyond 100 to count up to 120 by counting by 1s. Some students may begin to count in groups of 10 (while other students may use groups of 2s or 5s to count). Counting in groups of 10 as well as grouping objects into 10 groups of 10 will develop students’ understanding of place value concepts.

Students extend reading and writing numerals beyond 20 to 120. After counting objects, students write the numeral or use numeral cards to represent the number. Given a numeral, students read the numeral, identify the quantity that each digit represents using numeral cards, and count out the given number of objects.

Students should experience counting from different starting points (e.g., start at 83; count to 120). To extend students’ understanding of counting, they should be given opportunities to count backwards by ones and tens. They should also investigate patterns in the base 10 system.

1.NBT.B.2 Understanding the concept of 10 is fundamental to children’s mathematical development. Students need multiple opportunities counting 10 objects and “bundling” them into one group of ten. They count (up to 99) and make a bundle of 10 with or without some left over (this will help students who find it difficult to write teen numbers). As students are representing the various amounts, it is important that an emphasis is placed on the language associated with the quantity. For example, 53 should be expressed in multiple ways such as 53 ones or 5 groups of ten with 3 ones leftover. When students read numbers, they read them in standard form as well as using place value concepts. For example, 53 should be read as “fifty-three” as well as five tens, 3 ones. Reading 10, 20, 30, 40, 50 as “one ten, 2 tens, 3 tens, etc.” helps students see the patterns in the number system.

1.NBT.B.3 Students use models that represent two sets of numbers. To compare, students first attend to the number of tens, then, if necessary, to the number of ones. Students may also use pictures, number lines, and spoken or written words to compare two numbers.

1.NBT.C.4 Students represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. It is important for students to understand if they are adding a number that has 10s to a number with 10s, they will have more tens than they started with; the same applies to the ones. Also, students should be able to apply their place value skills to decompose numbers. For example, 17 + 12 can be thought of 1 ten and 7 ones plus 1 ten and 2 ones. Numeral cards may help students decompose the numbers into 10s and 1s.

Students should be exposed to problems both in and out of context and presented in horizontal and vertical forms. As students are solving problems, it is important that they use language associated with proper place value. They should always explain and justify their mathematical thinking both verbally and in a written format. Estimating the solution prior to finding the answer focuses students on the meaning of the operation and helps them attend to the actual quantities. This standard focuses on developing addition - the intent is not to introduce traditional algorithms or rules.

1.NBT.C.5 This standard requires students to understand and apply the concept of 10 which leads to future place value concepts. It is critical for students to do this without counting. Prior use of models such as base ten blocks, number lines, and 100s charts helps facilitate this understanding. It also helps students see the pattern involved when adding or subtracting 10.

Examples:

- 10 more than 43 is 53 because 53 is one more 10 than 43
- 10 less than 43 is 33 because 33 is one 10 less than 43
1.NBT.C.6. This standard is foundational for future work in subtraction with more complex numbers. Students should have multiple experiences representing numbers that are multiples of 10 (e.g. 90) with models or drawings. Then they subtract multiples of 10 (e.g. 20) using these representations or strategies based on place value. These opportunities develop fluency of addition and subtraction facts and reinforce counting up and back by 10s.

Examples:
- 70 - 30: Seven 10s take away three 10s is four 10s
- 80 - 50: 80, 70 (one 10), 60 (two 10s), 50 (three 10s), 40 (four 10s), 30 (five 10s)
- 60 - 40: I know that 4 + 2 is 6 so four 10s + two 10s is six 10s so 60 - 40 is 20
### Roosevelt School District  
First Grade - Curriculum Map – Mathematics

<table>
<thead>
<tr>
<th>Topic</th>
<th>Geometry</th>
<th>Quarter</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pacing</td>
<td>2 weeks</td>
<td>Sequence</td>
<td>2</td>
</tr>
</tbody>
</table>

#### STAGE 1 – Desired Results

**Standards:**
1.G.A.1. Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.

1.G.A.2. Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. (Students do not need to learn formal names such as “right rectangular prism.”)

1.G.A.3. Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

**Mathematical Practices:**
1.MP.1. Make sense of problems and persevere in solving them.
1.MP.6. Attend to precision.
1.MP.8. Look for and express regularity in repeated reasoning.

**Enduring Understandings:**
- Two-dimensional shapes have properties (attributes) that make them different from one another.
- Two-dimensional shapes can be described by their sides and vertices (corners).
- Two-dimensional shapes can be combined or broken apart to make other two-dimensional shapes.
- Equal shares can be created by partitioning wholes.

**Guiding Questions:**
- What are different ways shapes can be sorted or grouped?
- How can we put shapes together and take them apart to form other shapes?
- What makes a half a half?
- What makes a fourth a fourth?

**Students will know.....**
- Names of two dimensional shapes
- Defining attributes of shapes
- Three-dimensional figures or solid figures have length, width, and height.
- A half is one of the two parts created when a whole is separated into two equal shares.
- A fourth is one of the four parts created when a whole is separated into four equal shares.

**Students will be able to.....**
- Describe the defining attributes of two- and three-dimensional shapes.
- Put together two or more shapes (2-D and 3-D) to create a composite shape.
- Divide circles and rectangles to create halves and fourths.
- Describe and compare the relationship of equal shares to the whole.

**Instructional Resources:**
- EngageNY Module 5 Topics A-C
- enVisionMATH Topic 8 1-5

**Academic Vocabulary:**
- attributes
- side/edge
- corner/vertex
- face
- rectangle
- square
- trapezoid
- triangle
- cube
- cone
- cylinder
- half of/halves
- fourth of/fourths
- quarter of/quarters
- equal parts/fair shares

**Common Errors/Misconceptions:**
Students may think that a square that has been rotated so that the sides form 45-degree angles with the vertical diagonal is no longer a square but a diamond. They need to have experiences with shapes in different orientations.

Some students may think that fourths are larger than halves because there are four fourths in one whole and only two halves in one whole. Students need to focus on the change in the size of the fractional parts as the number of equal parts increases.
Examples and/or Explanations:

1.G.A.1 Attributes refer to any characteristic of a shape. Students use attribute language to describe a given two-dimensional shape: number of sides, number of vertices/points, straight sides, closed. A child might describe a triangle as “right side up” or “red.” These attributes are not defining because they are not relevant to whether a shape is a triangle or not. Students should articulate ideas such as, “A triangle is a triangle because it has three straight sides and is closed.” It is important that students are exposed to both regular and irregular shapes so that they can communicate defining attributes. Students should use attribute language to describe why these shapes are not triangles.

Students should also use appropriate language to describe a given three-dimensional shape: number of faces, number of vertices/points, number of edges.

Example: A cylinder may be described as a solid that has two circular faces connected by a curved surface (which is not considered a face). Students may say, “It looks like a can.”

Students should compare and contrast two-and three-dimensional figures using defining attributes.

Examples:
- List two things that are the same and two things that are different between a triangle and a cube.
- Given a circle and a sphere, students identify the sphere as being three-dimensional but both are round.
- Given a trapezoid, find another two-dimensional shape that has two things that are the same.

Students may use interactive whiteboards or computer environments to move shapes into different orientations and to enlarge or decrease the size of a shape still keeping the same shape. They can also move a point/vertex of a triangle and identify that the new shape is still a triangle. When they move one point/vertex of a rectangle they should recognize that the resulting shape is no longer a rectangle.

1.G.A.2 The ability to describe, use and visualize the effect of composing and decomposing shapes is an important mathematical skill. It is not only relevant to geometry, but is related to children’s ability to compose and decompose numbers. Students may use pattern blocks, plastic shapes, tangrams, or computer environments to make new shapes. The teacher can provide students with cutouts of shapes and ask them to combine them to make a particular shape. Example: What shapes can be made from four squares?

Students can make three-dimensional shapes with clay or dough, slice into two pieces (not necessarily congruent) and describe the two resulting shapes. For example, slicing a cylinder may result in two smaller cylinders.

1.G.A.3 Students need experiences with different sized circles and rectangles to recognize that when they cut something into two equal pieces, each piece will equal one half of its original whole. Children should recognize that halves of two different wholes are not necessarily the same size. Also they should reason that decomposing equal shares into more equal shares results in smaller equal shares.

Examples:
- Student partitions a rectangular candy bar to share equally with one friend and thinks “I cut the rectangle into two equal parts. When I put the two parts back together, they equal the whole candy bar. One half of the candy bar is smaller than the whole candy bar.”

- Student partitions an identical rectangular candy bar to share equally with 3 friends and thinks “I cut the rectangle into four equal parts. Each piece is one fourth of or one quarter of the whole candy bar. When I put the four parts back together, they equal the whole candy bar. I can compare the pieces (one half and one fourth) by placing them side-by-side. One fourth of the candy bar is smaller than one half of the candy bar.

- Students partition a pizza to share equally with three friends. They recognize that they now have four equal pieces and each will receive a fourth or quarter of the whole pizza.
Roosevelt School District
First Grade - Curriculum Map – Mathematics

<table>
<thead>
<tr>
<th>Topic</th>
<th>Telling Time</th>
<th>Quarter</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pacing</td>
<td>1 week</td>
<td>Sequence</td>
<td>1</td>
</tr>
</tbody>
</table>

**STAGE 1 – Desired Results**

**Standards:**

1.MD.B.3. Tell and write time in hours and half-hours using analog and digital clocks.
1.G.A.3. Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

**Mathematical Practices:**

1.MP.6. Attend to precision.
1.MP.8. Look for and express regularity in repeated reasoning.

**Enduring Understandings:**

- Minutes and hours are units of time.
- The hour hand tells the hour, and the minute hand tells the number of minutes after the hour.

**Guiding Questions:**

- How do we tell the difference between minutes and hours on a clock?
- What are different ways to write and tell time on a clock.

**Students will know.....**

- The parts/features of a clock

**Students will be able to.....**

- Tell time to the hour using an analog and digital clock.
- Write time to the hour using an analog and digital clock.
- Tell time to the half-hour using an analog and digital clock.
- Write time to the half-hour using an analog and digital clock.

**Instructional Resources:**

- EngageNY Module 5 Topic D
- enVisionMATH Topic 15 1-3

**Academic Vocabulary:**

- analog
- digital
- hour
- minute
- minute hand
- o’clock
- hour hand
- half
- half hour
- half past

**Common Misconceptions:**

Students often tend to confuse the hour hand and the minute hand.

**Examples and/or Explanations:**

Ideas to support telling time:

- within a day, the hour hand goes around a clock twice (the hand moves only in one direction)
- when the hour hand points exactly to a number, the time is exactly on the hour
- time on the hour is written in the same manner as it appears on a digital clock
- the hour hand moves as time passes, so when it is half way between two numbers it is at the half hour
- there are 60 minutes in one hour; so halfway between an hour, 30 minutes have passed half hour is written with “30” after the colon

- “It is 4 o’clock”
- “It is halfway between 8 o’clock and 9 o’clock. It is 8:30.”

The idea of 30 being “halfway” is difficult for students to grasp. Students can write the numbers from 0 - 60 counting by tens on a sentence strip. Fold the paper in half and determine that halfway between 0 and 60 is 30. A number line on an interactive whiteboard may also be used to demonstrate this.
Roosevelt School District  
First Grade - Curriculum Map – Mathematics

Topic: Place Value and Addition & Subtraction to 100
Quarter: 4
Pacing: 7 weeks
Sequence: 2

STAGE 1 – Desired Results

**Standards:**
1.OA.A.1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1.NBT.A.1. Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
1.NBT.A.2 Understand that the two digits of a two-digit number represent amounts of tens and ones.
1.NBT.B.3. Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.
1.NBT.C.4. Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
1.NBT.C.5. Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
1.NBT.C.6. Subtract multiples of 10 in the range 10–90 from multiples of 10 in the range 10–90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
2.MD.C.8. Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have? *(RSD: Use coins in preparation for Grade 2)*

**Mathematical Practices:**
1.MP.1. Make sense of problems and persevere in solving them.
1.MP.3. Construct viable arguments and critique the reasoning of others.
1.MP.5. Use appropriate tools strategically.

**Enduring Understandings:**
- Adding and subtracting groups of ten is similar to adding numbers less than 10.
- When adding tens to (or subtracting from) a two-digit number, only the tens digit changes.
- Each coin has a unique value.
- A given amount of money can be represented in multiple ways.

**Guiding Questions**
- How is adding or subtracting tens similar to adding or subtracting ones?
- What are the benefits of having coins of different values?

**Students will know.....**
- 10 can be thought of as a bundle of ten ones — called a “ten.”
- The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
- The commutative and identity properties of addition/subtraction.
- Coins and their values.

**Students will be able to.....**
- Count to 120 starting from any number less than 120.
- Read and write numbers to 120.
- Represent up to 120 objects with a written numeral.
- Compare numbers to 100 using the symbols >, =, and <.
- Mentally find 10 more or 10 less than a given two-digit number.
- Add and subtract multiples of 10 from multiples of 10 in the range of 10-90 using objects and drawings.
- Add within 100 using objects, drawing, properties of operations, and strategies based on place value.
- Relate addition and subtraction strategies to a written method.
- Solve real-life addition and subtraction word problems using tape diagrams and equations. *(Problem Types: compare difference unknown, compare bigger unknown, and compare smaller unknown)*
• Explain the reasoning used to solve addition and subtraction problems.
• Identify pennies, nickels, dimes, and quarters by their image, name, and value.
• Represent a quantity in multiple ways using coins.
• Use pennies to count on from a given coin.

### Instructional Resources:
- EngageNY Module 6
- enVisionMATH Topics 10-3,10-4 , T20

### Academic Vocabulary:
- add
- minus
- plus
- difference
- equals
- regroup
- pennies
- nickels
- dimes
- quarters
- sum
- tens
- coins
- cents
- ones

### Examples and/or Explanations:
Students extend their number fact and place value strategies to add within 100. They represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. It is important for students to understand if they are adding a number that has 10s to a number with 10s, they will have more tens than they started with; the same applies to the ones. Also, students should be able to apply their place value skills to decompose numbers. For example, 17 + 12 can be thought of 1 ten and 7 ones plus 1 ten and 2 ones. Numeral cards may help students decompose the numbers into 10s and 1s.

Students should be exposed to problems both in and out of context and presented in horizontal and vertical forms. As students are solving problems, it is important that they use language associated with proper place value (see example). They should always explain and justify their mathematical thinking both verbally and in a written format. Estimating the solution prior to finding the answer focuses students on the meaning of the operation and helps them attend to the actual quantities. This standard focuses on developing addition - the intent is not to introduce traditional algorithms or rules.

Examples:
- **43 + 36**  
  Student counts the 10s (10, 20, 30...70 or 1, 2, 3...7 tens) and then the 1s.

- **28 + 34**  
  Student thinks: 2 tens plus 3 tens is 5 tens or 50. S/he counts the ones and notices there is another 10 plus 2 more. 50 and 10 is 60 plus 2 more or 62.

- **45 + 18**  
  Student thinks: Four 10s and one 10 are 5 tens or 50. Then 5 and 8 is 5 + 5 + 3 (or 8 + 2 + 3) or 13. 50 and 13 is 6 tens plus 3 more or 63.

- **29 + 14**  
  Student thinks: “29 is almost 30. I added one to 29 to get to 30. 30 and 14 is 44. Since I added one to 29, I have to subtract one so the answer is 43.”
### Table 1 - Common Addition and Subtraction Situations*

<table>
<thead>
<tr>
<th>Add To</th>
<th>Change Unknown</th>
<th>Start Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Result Unknown</strong></td>
<td>Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now?</td>
<td>Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before?</td>
</tr>
<tr>
<td>2 + 3 = ?</td>
<td>2 + ? = 5</td>
<td>? + 3 = 5</td>
</tr>
<tr>
<td><strong>Change Unknown</strong></td>
<td>Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two?</td>
<td>Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before?</td>
</tr>
<tr>
<td>2 + 3 = ?</td>
<td>2 + ? = 5</td>
<td>? + 3 = 5</td>
</tr>
<tr>
<td><strong>Start Unknown</strong></td>
<td>Some bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies did I eat?</td>
<td>Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before?</td>
</tr>
<tr>
<td>2 + ? = 5</td>
<td>2 + ? = 5</td>
<td>? – 2 = 3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Take From</th>
<th>Total Unknown</th>
<th>Both Addends Unknown¹</th>
<th>Addend Unknown²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Result Unknown</strong></td>
<td>Five apples were on the table. I ate two apples. How many apples are on the table now?</td>
<td>Grandma has five flowers. How many can she put in her red vase and how many in her blue vase?</td>
<td>Five apples are on the table. Three are red and the rest are green. How many apples are green?</td>
</tr>
<tr>
<td>5 – 2 = ?</td>
<td>5 = 0 + 5, 5 = 5 + 0</td>
<td>3 + 2 = 5, 5 – 3 = ?</td>
<td></td>
</tr>
<tr>
<td><strong>Change Unknown</strong></td>
<td>Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat?</td>
<td>5 = 1 + 4, 5 = 4 + 1</td>
<td>5 = 2 + 3, 5 = 3 + 2</td>
</tr>
<tr>
<td><strong>Start Unknown</strong></td>
<td>Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before?</td>
<td>? – 2 = 3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Put Together / Take Apart</th>
<th>Total Unknown</th>
<th>Both Addends Unknown¹</th>
<th>Addend Unknown²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Result Unknown</strong></td>
<td>Three red apples and two green apples are on the table. How many apples are on the table?</td>
<td>Grandma has five flowers. How many can she put in her red vase and how many in her blue vase?</td>
<td>Five apples are on the table. Three are red and the rest are green. How many apples are green?</td>
</tr>
<tr>
<td>3 + 2 = ?</td>
<td>5 = 0 + 5, 5 = 5 + 0</td>
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<td></td>
</tr>
<tr>
<td><strong>Change Unknown</strong></td>
<td></td>
<td>5 = 1 + 4, 5 = 4 + 1</td>
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</tr>
<tr>
<td><strong>Start Unknown</strong></td>
<td></td>
<td>? – 2 = 3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compare</th>
<th>Difference Unknown</th>
<th>Bigger Unknown</th>
<th>Smaller Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Result Unknown</strong></td>
<td>“How many more?” version: Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy?</td>
<td>“More” version suggests operation: Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have?</td>
<td>“Fewer” version suggests operation: Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have?</td>
</tr>
<tr>
<td><strong>Change Unknown</strong></td>
<td>“How many fewer?” version: Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie?</td>
<td>“Fewer” version suggests wrong operation: Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have?</td>
<td>“More” version suggests wrong operation: Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have?</td>
</tr>
</tbody>
</table>

*Adapted from Mathematics Learning in Early Childhood, National Research Council, AZ Mathematics Standards, and Progressions for the CCSS in Mathematics

Darker shading indicates the four Kindergarten problem subtypes. Grade 1 and 2 students work with all subtypes. Unshaded (white) problems are the four difficult subtypes that students should work with in Grade 1 but need not master until Grade 2.

¹These take apart situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help children understand that the = sign does not always mean makes or results in but always does mean is the same number as.

²Either addend can be unknown, so there are three variations of these problem situations. Both Addends Unknown is a productive extension of this basic situation, especially for small numbers less than or equal to 10.
<table>
<thead>
<tr>
<th>STAGE 2 – Assessment Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summative Measures:</td>
</tr>
<tr>
<td>•</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STAGE 3 – Learning Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Objectives and/or Tasks:</td>
</tr>
<tr>
<td>•</td>
</tr>
</tbody>
</table>