1. ***Developing understanding of addition, subtraction, and strategies for addition and subtraction within 20***
   * 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. ***Developing understanding of whole number relationship and place value, including grouping in tens and ones***
   * Students develop, discuss, and use efficient, accurate, and generalizable methods to add within 100 and subtract multiples of 10. The 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. ***Developing understanding of linear measurement and measuring lengths as iterating length units***
   * 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. (Note: students should apply the principle of transitivity of measurement to make direct comparisons, but they need not use this technical term.)
4. ***Reasoning about attributes of, and composing and decomposing geometric shapes***
   * 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.

**\*\*PRIORITY STANDARDS**

**Operations and Algebraic Thinking**

**Represent and solve problems involving addition and subtraction.**

\*\*1.OA.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. (Note: See Glossary, Table 1.)

1.OA.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.

**Understand and apply properties of operations and the relationship between addition and subtraction.**

\*\*1.OA.3: Apply properties of operations as strategies to add and subtract. (Note: Students need not use formal terms for these properties.)

*Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)*

1.OA.4: Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.*

**Add and subtract within 20.**

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

\*\*1.OA.6: Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).

**Work with addition and subtraction equations.**

1.OA.7: Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. *For example, which* *of the following equations are true and which are false? 6 = 6, 7 = 8 – 1,* *5 + 2 = 2 + 5, 4 + 1 = 5 + 2.*

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

*For example, determine the* *unknown number that makes the equation true in each of the equations 8 +* *? = 11,   
5 =* 􀃍 *– 3, 6 + 6 =* 􀃍*.*

**Number and Operations in Base Ten**

**Extend the counting sequence.**

\*\*1.NBT.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.

**Understand place value.**

\*\*1.NBT.2: Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

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.

c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

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

**Use place value understanding and properties of operations to add and subtract.**

\*\*1.NBT.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.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.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.

**Measurement and Data**

**Measure lengths indirectly and by iterating length units.**

1.MD.1: Order three objects by length; compare the lengths of two objects indirectly by using a third object.

\*\*1.MD.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.*

**Tell and write time.**

\*\*1.MD.3: Tell and write time in hours and half-hours using analog and digital clocks.

**Represent and interpret data.**

\*\*1.MD.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.

**Geometry**

**Reason with shapes and their attributes.**

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

\*\*1.G.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. (Note: Students do not need to learn formal names such as “right rectangular prism.”)

\*\*1.G.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.

**Math Practices and**

**Questions to Develop Mathematical Thinking**

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

* **How would you describe the problem in your own words?**
* **What is the question you are trying to answer?**
* **How is this problem like another problem you have solved?**
* **How did you reach that conclusion?**
* **What else can you try?**

**2. Reason abstractly and quantitatively.**

* **What do the numbers you have here represent?**
* **What is the relationship between \_\_\_\_ and \_\_\_\_?**

**Centimeter**

**Inch**

**Hours**

**Half hour**

**Minutes**

**Digital**

**Clock**

**Trapezoid**

**Half-circle**

**Quarter-circle**

**Cube**

**Right rectangular prism**

**Cone**

**Cylinder**

**Half**

**Fourth**

**Quarter (fraction)**

**Addition**

**Subtraction**

**Sum**

**Difference**

**Group**

**Counting On**

**Making ten**

**Doubles**

**Combinations**

**Equal sign**

**True**

**False**

**Unknown**

**Digits**

**Two-digit number**

**Greater than sign**

**Less than sign**

**Mental math**

**Unit**

* **What if you started with \_\_\_\_ rather than \_\_\_\_?**
* **Does what you have recorded make sense?**

**3. Construct viable arguments and critique the reasoning of others.**

* **How can we be sure that…? /How could you prove that…?**
* **How would you convince me that your answer makes sense?**
* **How did you decide to use that strategy?**
* **Can you explain to the class why your method works?**
* **Do you think your partner’s solution makes sense? Why or why not?**

**4. Model with mathematics.**

* **What is the number sentence that matches the drawing, number line…?**
* **How would it help to create a drawing, table, etc.?**
* **How can you use math to model the problem?**

**5. Use appropriate tools strategically.**

* **What math tools have you considered using?**
* **What did the tool help you discover?**
* **How did using that tool help you solve the problem?**
* **What can using a \_\_\_\_\_ show us that a \_\_\_\_\_ may not?**

**Components of SIOP**

**6. Attend to precision.**

* **What (new) math terms did you use today? How did you use them?**

1. **Lesson Preparation**
2. **Building Background**
3. **Comprehensible Input**
4. **Strategies**
5. **Interaction**
6. **Practice and Application**
7. **Lesson Delivery**
8. **Review and Assessment**

* **How did you know your solution was reasonable?**
* **Is the method you used an efficient one? How so?**
* **How could you state your conclusion more precisely?**

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

* **What observations do you make about…?**
* **What patterns do you find in…?**
* **How do you know if something is a pattern?**
* **What are some other problems that are similar to this one?**
* **In what ways does this problem connect to other math concepts?**

**Principle 6: The school offers a meaningful and challenging academic curriculum that respects all learners, develops their character, and helps them to succeed.**

**6.1 The academic curriculum provides meaningful and appropriate challenges to all students.**

* Teachers provide all students with opportunities to interact with academic content in engaging, hands-on, appropriate ways (e.g., cooperative learning, problem solving, and experience-based projects).
* Students report feeling challenged by and excited about what they are learning in school. Parents report that their children are appropriately challenged and that teachers have high expectations.
* The school community encourages students to seek mastery of content and skills.
* Instruction increases students’ sense of competence and emphasizes student autonomy (e.g., by providing them with opportunities to think creatively and test their ideas, by giving them a voice in classroom decisions and plans that affect them)

**6.2 The school staff identifies, understands, and accommodates the diverse interests, cultures, and learning needs of all students.**

* Staff members engage in ongoing identification of students’ learning needs. Differentiated instruction appears organic—a natural part of the school day for all students.
* Staff members challenge and help all students do high-quality work and strive for continuous improvement.
* Parents and students report that teachers know their students well and understand and respond to their learning needs and cultural differences.
* Schools recognize existing achievement gaps between diverse student subgroups and take active steps to eliminate such gaps.

**6.3 Teachers promote the development of performance character traits that support students’ intellectual growth, academic performance, and capacity for both self-direction and teamwork.**

* Teachers promote thinking habits (e.g., curiosity, truth-seeking, critical thinking, and open-mindedness) that lead to intellectual growth in students.
* Students set goals and are aware of their growth as learners.
* Teachers promote work-related habits (e.g., perseverance, responsible decision-making, self-management, and challenge-seeking) that help students do their best work.
* Teachers promote social habits (e.g., honesty, responsibility, collaboration) that help students work together harmoniously (e.g., through cooperative learning).
* Teachers promote, and students report, the importance of academic integrity in the completion of work.

**Principles of Character Education**

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

* **Explain how this strategy would work in other situations.**
* **Is this always true, sometimes true, or never true? How do you know?**
* **What would happen if …?**
* **What repetitions do you notice? What does that tell you?**

**Critical Vocabulary**