



# Park Hill School District

Building Successful Futures • Each Student • Every Day

## Summer School 2nd Grade Math Curriculum

### Scope and Sequence:

Timeframe	Unit	Instructional Topics
23 Days	Summer School 2nd Grade Math	Topic A: Comparison Word Problems Topic B: Numbers to 120 Topic C: Addition to 100 Using Place Value Understanding Topic D: Varied Place Value Strategies for Addition to 100 Topic E: Coins and Their Values Topic F: Varied Problem Types Within 20 Topic G: Culminating Experiences

## Summer School 2nd Grade Math

**Subject:** Math

**Grade:** 2<sup>nd</sup> Grade

**Name of Unit:** Place Value, Comparison, Addition and Subtraction to 100

**Length of Unit:** 23 days

**Overview of Unit:**

**In Topic A**, students grapple with comparative word problem types (1.OA.1). While students solved some comparative problem types during Module 3 and within the Application Problems in Module 5, this is their first opportunity to name these types of problems and learn to represent comparisons using tape diagrams with two tapes.

Students extend their understanding of and skill with tens and ones to numbers to 100 in **Topic B** (1.NBT.2). For example, they mentally find 10 more, 10 less, 1 more, and 1 less (1.NBT.5) and compare numbers using the symbols  $>$ ,  $=$ , and  $<$  (1.NBT.3). They then count and write numbers to 120 (1.NBT.1) using both standard numerals and the unit form.

**In Topics C and D**, students again extend their learning from Module 4 to the numbers to 100 to add and subtract (1.NBT.4, 1.NBT.6). They add pairs of two-digit numbers in which the ones digits sometimes have a sum greater than 10, recording their work using various methods based on place value (1.NBT.4). **In Topic D**, students focus on using drawings, numbers, and words to solve, highlighting the role of place value, the properties of addition, and related facts.

At the start of the second half of Module 6, students are introduced to nickels and quarters (1.MD.3), having already used pennies and dimes in the context of their work with numbers to 40 in Module 4. Students use their knowledge of tens and ones to explore decompositions of the values of coins. For example, they might represent 25 cents using 1 quarter, 25 pennies, 2 dimes and 1 nickel, or 1 dime and 15 pennies.

**In Topic F**, students really dig into MP.1 and MP.3. The topic includes the more challenging compare with bigger or smaller unknown word problem types, wherein more or less suggests the incorrect operation (1.OA.1), thus giving a context for more in-depth discussions and critiques. On the final day of this topic, students work with varied problem types, sharing and explaining their strategies and reasoning. Peers ask each other questions and defend their choices. The End-of-Module Assessment follows Topic F.

The module and year close with **Topic G**, wherein students celebrate their year's worth of learning with fun fluency festivities that equip them with games to maintain their fluency during the summer months prior to Grade 2. To send home their year's work, the final day is devoted to creating a math folder illustrating their learning.

**Priority Standards for Unit:**

**1.OA.1**

- 1.RA.A.1 Use addition and subtraction within 20 to solve problems.

**1.NBT.1**

- 1.NS.A.1 Count to 120, starting at any number less than 120.
- 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.NS.A.2 Read and write numerals and represent a number of objects with a written numeral.
- 1.NS.A.3 Count backward from a given number between 20 and 1.
- 1.NS.A.4 Count by 5s to 100 starting at any multiple of five.

#### **1.NBT.B.2**

- 1.NBT.A.1 Understand that 10 can be thought of as a bundle of 10 ones – called a “ten”.
- 1.NBT.A.2 Understand two-digit numbers are composed of ten(s) and one(s).

#### **1.NBT.B.3**

- 1.NBT.A.3 Compare two two-digit numbers using the symbols  $>$ ,  $=$  or  $<$ .

#### **1.NBT.C.4**

- 1.NBT.B.5 Add within 100.

#### **1.NBT.C.5**

- 1.NBT.B.6 Calculate 10 more or 10 less than a given number mentally without having to count.

#### **1.NBT.C.6**

- 1.NBT.B.7 Add or subtract a multiple of 10 from another two-digit number, and justify the solution.

#### **1.MD.B.3**

- 1.GM.C.9 Know the value of a penny, nickel, dime and quarter.

#### **Foundational Standards for unit:**

- K.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
- K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g.,  $5 = 2 + 3$  and  $5 = 4 + 1$ ).
- K.OA.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.
- K.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g.,  $18 = 10 + 8$ ); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

#### **Mathematical Practices:**

- **MP.1 Make sense of problems and persevere in solving them.** Throughout Topic A, students analyze given situations and determine whether they are compare, take away, or

put together problem types. Students’ drawings, such as single and double tape diagrams, represent their planning toward a solution pathway. During Topic F, students initially work independently, supporting them in learning how to persevere and make sense of problems. As students share their strategies and solutions asking and answering peer questions, they demonstrate understanding of the approaches of their peers and identify corresponding elements between the approaches.

- **MP.3 Construct viable arguments and critique the reasoning of others.** During Topic F, students share their strategies and reasoning as they explain their solutions to various problem types. They ask useful questions to help clarify or improve peers’ explanations, such as, “How does your drawing help demonstrate your thinking?” Students consider how a selected student’s work helped her solve the problem, as well as other pathways for the student to correctly solve the problem. As students share their thinking, they explain the mathematical reasoning that supports their argument.
- **MP.4 Model with mathematics.** Throughout this module, students model their mathematics in various ways. While problem solving, students use tape diagrams and number sentences to model situations and solutions. When sharing various strategies for adding within 100, students use number bonds, number sentences, and sometimes drawings to solve for the sums and to demonstrate their understanding and use of place value, properties of addition, and the relationship between addition and subtraction as they decompose and recompose numbers.
- **MP.5 Use appropriate tools strategically.** After learning varied representations and strategies for adding and subtracting pairs of two-digit numbers, students choose their preferred methods for representing and solving problems efficiently. As they share their strategies, students explain their choice of making ten, adding tens and then ones, or adding ones and then tens. They also demonstrate how their choice of written method (number bonds, vertical alignment, or arrow notation) expresses their strategy work.

<b>Unwrapped Concepts (Students need to know)</b>	<b>Unwrapped Skills (Students need to be able to do)</b>	<b>Bloom’s Taxonomy Levels</b>	<b>Webb’s DOK</b>
Strategy	Understand	Understand	3
Digit	Compare	Understand	3
Equation	Represent	Analyze	2
Memory	Putting together	Remember	1
Unknown	Taking apart	Remember	1
Properties	Adding to	Remember	1
operations	Taking from	Apply	2

**Essential Questions:**

1. What are some ways to think about addition and subtraction?
2. What are strategies for finding addition and subtraction facts?
3. How do composing and decomposing numbers lead to understanding word problems?
4. How can numbers be put together and taken apart to solve problems?
5. How can numbers to 100 be shown and compared?
6. What is the standard procedure for adding two-digit numbers?
7. What is the standard procedure for subtracting two-digit numbers?

**Enduring Understanding/Big Ideas:**

1. Addition and subtraction can be represented on various models.
2. Numbers are composed of other numbers.
3. There are different problem solving structures which can be used to solve problems in multiple ways.
4. Numbers can represent quantity, position, location and relationships.
5. Place value can be used to understand and model properties of operations.
6. Mental strategies help in solving problems quickly and accurately.

**Unit Vocabulary:**

<b>Academic Cross-Curricular Words</b>	<b>Content/Domain Specific</b>
Solve Explain	Doubles Near doubles Mental math Tens digit Next ten

## Topic A: Comparison Word Problems

**Title:** Comparison Word Problems

**Suggested Length of Time:** 2 Days

**Standards Addressed**

*Priority:*

- 1.RA.A.1 Use addition and subtraction within 20 to solve problems. *1.OA.1*

**Detailed Description/Instructions:**

Topic A of Module 6 opens with students exploring one of the most challenging problem types for their grade level, comparison word problems (see Table 2 below from *Counting and Cardinality and Operations and Algebraic Thinking Progressions* document, page 9) (1.OA.1). Students were informally introduced to the problem type in Module 3 as they analyzed data and compared measurements. During Module 5, students worked with comparison contexts through Application Problems. It is with this background that teachers can make informed choices during Module 6 to support students in recognizing and solving comparison word problems.

In Lesson 1, students work with *compare with difference unknown* problem types using double tape diagrams. They then carry their understanding of double tape diagrams into Lesson 2 to tackle *compare with bigger or smaller unknown* problem types. Throughout the module, students continue to practice these problem types as they solve Application Problems in the topics that follow.

**Bloom's Level:**

**Webb's DOK:** 3

Table 2: Addition and subtraction situations by grade level.

	Result Unknown	Change Unknown	Start Unknown
<b>Add To</b>	<p><i>A</i> bunnies sat on the grass. <i>B</i> more bunnies hopped there. How many bunnies are on the grass now?</p> $A + B = \square$	<p><i>A</i> bunnies were sitting on the grass. Some more bunnies hopped there. Then there were <i>C</i> bunnies. How many bunnies hopped over to the first <i>A</i> bunnies?</p> $A + \square = C$	<p>Some bunnies were sitting on the grass. <i>B</i> more bunnies hopped there. Then there were <i>C</i> bunnies. How many bunnies were on the grass before?</p> $\square + B = C$
<b>Take From</b>	<p><i>C</i> apples were on the table. I ate <i>B</i> apples. How many apples are on the table now?</p> $C - B = \square$	<p><i>C</i> apples were on the table. I ate some apples. Then there were <i>A</i> apples. How many apples did I eat?</p> $C - \square = A$	<p>Some apples were on the table. I ate <i>B</i> apples. Then there were <i>A</i> apples. How many apples were on the table before?</p> $\square - B = A$
	Total Unknown	Both Addends Unknown <sup>1</sup>	Addend Unknown <sup>2</sup>
<b>Put Together / Take Apart</b>	<p><i>A</i> red apples and <i>B</i> green apples are on the table. How many apples are on the table?</p> $A + B = \square$	<p>Grandma has <i>C</i> flowers. How many can she put in her red vase and how many in her blue vase?</p> $C = \square + \square$	<p><i>C</i> apples are on the table. <i>A</i> are red and the rest are green. How many apples are green?</p> $A + \square = C$ $C - A = \square$
	Difference Unknown	Bigger Unknown	Smaller Unknown
<b>Compare</b>	<p><i>"How many more?"</i> version. Lucy has <i>A</i> apples. Julie has <i>C</i> apples. How many more apples does Julie have than Lucy?</p> <p><i>"How many fewer?"</i> version. Lucy has <i>A</i> apples. Julie has <i>C</i> apples. How many fewer apples does Lucy have than Julie?</p> $A + \square = C$ $C - A = \square$	<p><i>"More"</i> version suggests operation. Julie has <i>B</i> more apples than Lucy. Lucy has <i>A</i> apples. How many apples does Julie have?</p> <p><i>"Fewer"</i> version suggests wrong operation. Lucy has <i>B</i> fewer apples than Julie. Lucy has <i>A</i> apples. How many apples does Julie have?</p> $A + B = \square$	<p><i>"Fewer"</i> version suggests operation. Lucy has <i>B</i> fewer apples than Julie. Julie has <i>C</i> apples. How many apples does Lucy have?</p> <p><i>"More"</i> version suggests wrong operation. Julie has <i>B</i> more apples than Lucy. Julie has <i>C</i> apples. How many apples does Lucy have?</p> $C - B = \square$ $\square + B = C$

Darker shading indicates the four Kindergarten problem subtypes. Grade 1 and 2 students work with all subtypes and variants. Unshaded (white) problems are the four difficult subtypes or variants that students should work with in Grade 1 but need not master until Grade 2. Adapted from CCSS, p. 88, which is based on *Mathematics Learning in Early Childhood: Paths Toward Excellence and Equity*, National Research Council, 2009, pp. 32–33.

<sup>1</sup> This can be used to show all decompositions of a given number, especially important for numbers within 10. Equations with totals on the left help children understand that = does not always mean "makes" or "results in" but always means "is the same number as." Such problems are not a problem subtype with one unknown, as is the Addend Unknown subtype to the right. These problems are a productive variation with two unknowns that give experience with finding all of the decompositions of a number and reflecting on the patterns involved.

<sup>2</sup> Either addend can be unknown; both variations should be included.

## Topic B: Numbers to 120

**Title:** Numbers to 120

**Suggested Length of Time:** 4 days

### Standards Addressed

#### *Priority:*

- 1.NS.A.1 Count to 120, starting at any number less than 120. *1.NBT.1*
- 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.1*
- 1.NS.A.2 Read and write numerals and represent a number of objects with a written numeral. *1.NBT.1*
- 1.NS.A.3 Count backward from a given number between 20 and 1. *1.NBT.1*
- 1.NS.A.4 Count by 5s to 100 starting at any multiple of five. *1.NBT.1*
- 1.NBT.A.1 Understand that 10 can be thought of as a bundle of 10 ones – called a “ten”. *1.NBT.2*
- 1.NBT.A.2 Understand two-digit numbers are composed of ten(s) and one(s). *1.NBT.2*
- 1.NBT.A.3 Compare two two-digit numbers using the symbols  $>$ ,  $=$  or  $<$ . *1.NBT.B.3*
- 1.NBT.B.6 Calculate 10 more or 10 less than a given number mentally without having to count

### Detailed Description/Instructions:

Topic B extends students’ use of counting sequences and understanding of tens and ones to numbers up to and including 120.

**In Lesson 3**, students apply their understanding of tens and ones to two-digit numbers greater than 40. Students count by tens and then extra ones to efficiently count large groups of objects. They then use the place value chart to record quantities as tens and ones as well as by their traditional number (**1.NBT.2**).

**In Lesson 4**, students connect this understanding with its application to addition sentences. Students recognize that numbers such as 67 can be interpreted as 6 tens 7 ones and that the units can be combined to find the total:  $60 + 7 = 67$ . This work of decomposing and composing 67 into its tens and ones supports the work students do in Topic C, as they decompose two-digit numbers before adding to another two-digit number.

Students continue to consider tens and ones **in Lesson 5** when they identify 10 more, 10 less, 1 more, and

1 less than any two-digit number (**1.NT.5**). This work helps students attend to the parts within a two-digit number, a skill that is critical to adding two-digit numbers within 100. Students recognize that when looking at a number such as 37, they focus on the tens place when adding or

subtracting 10 and on the ones place when adding or subtracting 1. Students also explore numbers such as 89, where adding 1 more creates another ten.

**During Lesson 6**, students practice comparing numbers using the symbols  $>$ ,  $=$ , and  $<$  (**1.NBT.3**). They compare numbers such as 65 and 75, as well as numbers in various unit form combinations such as 7 tens

5 ones, 5 ones 7 tens, and 6 tens 15 ones. Through these explorations, students consider ways that each number can be decomposed and recomposed.

**Lesson 8** continues the use of the Hide Zero cards, as students use 5-group cards of 10 to write numbers within place value charts. Students represent 100 as 10 tens and then represent 101 as 10 tens and 1 one. This work with the unit form of numbers to 120 supports students' understanding of the written numerals 101 through 109, which are the most challenging to write (**1.NBT.1**).

**Bloom's Level:** Apply

**Webb's DOK:** 3

## Topic C: Addition to 100 Using Place Value Understanding

**Title:** Addition to 100 Using Place Value Understanding

**Suggested Length of Time:** 5 days

### Standards Addressed

#### *Priority:*

- 1.NS.A.1 Count to 120, starting at any number less than 120. *1.NBT.1*
- 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.1*
- 1.NS.A.2 Read and write numerals and represent a number of objects with a written numeral. *1.NBT.1*
- 1.NS.A.3 Count backward from a given number between 20 and 1. *1.NBT.1*
- 1.NS.A.4 Count by 5s to 100 starting at any multiple of five. *1.NBT.1*
- 1.NBT.A.1 Understand that 10 can be thought of as a bundle of 10 ones – called a “ten”. *1.NBT.2*
- 1.NBT.A.2 Understand two-digit numbers are composed of ten(s) and one(s). *1.NBT.2*
- 1.NBT.A.3 Compare two two-digit numbers using the symbols  $>$ ,  $=$  or  $<$ . *1.NBT.B.3*
- 1.NBT.B.6 Calculate 10 more or 10 less than a given number mentally without having to count

### Detailed Description/Instructions:

During Topic C, students apply all of their place value and Level 3 strategy knowledge to add pairs of two-digit numbers to sums within 100. To this point, students have only added pairs of two-digit numbers within 40. They now extend their skills and strategies to larger pairs, such as  $36 + 57$ , using all of the same methods.

**Lesson 10** focuses students on number work with tens as they add and subtract multiples of 10 from multiples of 10. Students see that  $20 + 70$  is the same as 2 tens + 7 tens and that  $80 - 50$  is the same as

$8 \text{ tens} - 5 \text{ tens}$  (1.NBT.4, 1.NBT.6).

Building from student work with multiples of 10, **Lesson 11** scaffolds students to add a multiple of 10 to any two-digit number, such as  $64 + 30$  (1.NBT.4). While some students may initially apply their ability to mentally add 10 by counting on by tens (64, 74, 84, 94), students also decompose 64 into 60 and 4 to solve, as shown to the right.

**In Lesson 12**, students add a pair of two-digit numbers when the ones digits have a sum less than or equal to 10 (1.NBT.4). They continue using strategies developed in Module 4. For example, when adding  $47 + 23$ , students may choose to decompose the second addend into 20 and 3. They then add 20 to 47, making 67, and then add the remaining ones. Other students may choose to add the ones to the first addend and then add on the remaining tens, as shown to the right.

**Lessons 13 and 14** focus on the most challenging addition work of this grade level as students add a pair of two-digit numbers when the ones digits have a sum greater than 10, as shown to the right (1.NBT.4).

**During Lesson 15**, students see how they can align materials or drawings to more distinctly separate and add tens with tens and ones with ones, recording the total below the drawings. Students connect this work with their decomposition work from Lessons 10 and 11, as shown to the right.

**Lesson 16** extends this work, having students add a pair of two-digit numbers, such as  $36 + 57$ , recording the 13 as 1 ten 3 ones as a part of their written method for recording their process.

During **Lesson 17**, students continue to strengthen their skills and strategies to solve double-digit addition problems (1.NBT.4).

**Bloom's Level:** Apply

**Webb's DOK:** 3

## Topic D: Varied Place Value Strategies for Addition to 100

**Title:** Varied Place Value Strategies for Addition to 100

**Suggested Length of Time:** 2 days

**Standards Addressed**

*Priority:*

- 1.NBT.B.5 Add within 100

**Detailed Description/Instructions:**

During Topic D, students discuss and compare the various place value strategies they use when adding to 100 (1.NBT.4). Students have the opportunity to explain their thinking and better understand the strategies based on the examples and explanations of peers.

Lesson 18 has students adding a pair of two-digit numbers, such as  $36 + 57$ , in more than one way, explaining the similarities and differences in the methods. Students recognize that they can achieve the same accurate sum through the varied strategies, as they decompose and recompose the numbers, attending to the tens and ones.

Students share their preferred strategies in Lesson 19, explaining the reason they choose to use a particular strategy for a particular set of addends. For instance, when adding  $39 + 43$ , one student may prefer to use the make ten strategy, decomposing 43 into 1 and 42, because adding  $40 + 42$  is an easy problem for her. Another student may prefer vertically aligning the numbers to ensure that he is adding ones with ones and then tens with tens. Students discuss questions such as, “In which number bonds do you see an easier problem to solve? Is there another way to solve this problem? How are [the selected student’s] methods different from or the same as your partner’s? What is a compliment you would like to give [him or her]?”

**Bloom’s Level:** Apply

**Webb’s DOK:** 3

## Topic E: Coins and Their Strategies

**Title:** Coins and Their Strategies

**Suggested Length of Time:** 2 days

**Standards Addressed**

*Priority:*

- 1.GM.C.9 Know the value of a penny, nickel, dime and quarter. *1.MD.B.3*

**Detailed Description/Instructions:**

Through Topic E, students learn about the four most predominant U.S. coins in circulation: the penny, the nickel, the dime, and the quarter. Students identify and use the coins based on their image, name, or value (1.MD.3).

During Lesson 22, students continue to work with all four coins. Various sequences are provided to best match the learning needs of the class. Finally, in Lesson 23, students count on from any coin to create various values.

To culminate the topic, students use dimes and pennies as representations of numbers to 120, connecting the prior knowledge students have developed throughout the module to their work in Topic E.

**Bloom's Level:** Apply

**Webb's DOK:** 2

## Topic F: Varied Problem Types Within 20

**Title:** Varied Problem Types Within 20

**Suggested Length of Time:** 2 days

**Standards Addressed**

*Priority:*

- 1.RA.A.1 Use addition and subtraction within 20 to solve problems. *1.OA.1*

**Detailed Description/Instructions:**

Topic F provides students the opportunity to focus on solving various problem types and to learn from their peers' strategies.

Lessons 25 and 26 focus on the most challenging Grade 1 problem types: *compare with bigger unknown* and *compare with smaller unknown* (1.OA.1). Students continue to strengthen their ability to recognize *compare* problem types and solve for unknowns in varied positions. They also work with problem types that suggest the incorrect operation, such as, "Shanika went down the slide 15 times. She went down 3 more times than Fran. How many times did Fran go down the slide?" While students do not need to master this problem type in Grade 1, exposure to these problems can support students' long-term success. During Lesson 26, students are provided more time to practice the various problem types and to learn to persevere in problem solving.

In Lesson 27, students practice all of the problem types they have encountered throughout the year. They discuss their methods for solving the problems and explain their work, including answering such questions as, "How does Student A's work help her solve the problem? How does Student B's work help him solve the problem? What compliment can we give Student A? What might Student A do to improve her work? What do you notice about your own work after looking at Student A's and Student B's work?"

**Bloom's Level:** Apply

**Webb's DOK:** 3

## Topic G: Culminating Experiences

**Title:** Numbers to 120

**Suggested Length of Time:** 3 days

**Standards Addressed**

*Priority: Culmination of all standards*

**Detailed Description/Instructions:**

Topic G culminates not only Module 6, but also a full year of learning for Grade 1 students. It is a joyous celebration of the great progress of all students. During each lesson, students recognize how much they know now in comparison with the start of the year. They celebrate this learning by using their acquired skills and knowledge to enjoy entertaining games and activities with their peers.

During Lessons 28 and 29, students play games with cards and dice that celebrate their progress in fluently adding and subtracting within 10 and 20. All of the games are played with materials that students can find at home or bring home from school to encourage engaging summer practice.

**Bloom's Level:**

**Webb's DOK:**

## Engaging Scenario

**Engaging Scenario** (An Engaging Scenario is a culminating activity that includes the following components: situation, challenge, specific roles, audience, product or performance.) To culminate the year, students create folder covers that can be used to bring home the math work from the year. The covers are designed to illustrate students' learning across the course of the year and to celebrate their individual accomplishments.

### **All Resources needed for Unit:**

Consumable resources:

- Composition notebook (1 per student)
- 2 pocket folder (1 per student)
- Pencils
- Chart paper

Online resources:

<https://www.engageny.org/resource/grade-1-mathematics-module-6#>

Manipulatives:

- Connecting Cubes or snap cubes (class set approx 1,000)
- Place Value Blocks (class set) 1- Thousand block, 500-hundreds flats, 500-tens rods, 500-ones units
- Index Cards (1 pack)
- Dice (class set)
- 2 sided counters (class set approx 500)
- 4 storage boxes for manipulatives (2 shoebox size, 2 med)