

**U46 Curriculum**  
**2<sup>nd</sup> Grade Math**

**Module 1: Sums and Differences to 20**

**Domain(s): Operations and Algebraic Thinking**

**Trimester(s): 1st**

**Transfer: *Students will apply...***

Addition and subtraction concepts and skills to addition to 20.

Using those whole-number measurements, students will be able to represent addition and subtraction on a number line diagram.

Students will create and interpret picture and bar graphs to solve simple problems using numbers 1-20

Students will solve problems involving:

1. Result Unknown problem situation example: Five toy cars were on the table. My brother borrowed 3 of them. How many toy cars remain? ( $5 - 3 = ?$ )
2. Change Unknown problem situation example: 17 students were in the cafeteria. Some left and now there are 7 students in the cafeteria. How many students left the cafeteria? ( $17 - ? = 7$ )
3. Start Unknown problem situation example: The Marcus family picked some oranges. They gave 8 to their neighbor and kept the rest for themselves. If they kept 12 oranges, how many did they have to start? ( $? - 8 = 12$ )

**Understandings: *Students will understand that...***

1. Numbers are composed of other numbers.
2. There are different problem solving structures which can be used to solve problems in multiple ways.
3. Unknown quantities can be represented in different places in an equation/number model.

**Essential Question(s):**

1. How do composing and decomposing numbers lead to understanding word problems?
2. How can numbers be put together and taken apart to solve problems?
3. How does an equation represent an unknown quantity?
4. How do visual representations depict addition and subtraction?

**Knowledge: *Students will know...***

1. Basic addition and subtraction computation and problem solving strategies.
2. The properties of addition (commutative, associative, and identity.)

**Skill: Students will be able to...**

1. Solve one-step word problems within 20 by adding to, taking from, putting together, taking apart, and comparing number models involving *results unknown, change unknown, and start unknown* using objects, drawings, and equations with a symbol for the unknown number. (2.OA.1)
2. Fluently add and subtract within 20. (2.OA.2)
3. Write an equation using a symbol for the unknown number to represent the problem. (2.MD.5)
4. Represent whole numbers as lengths from 0 on a number line diagram. (2.MD.6)
5. Use number line diagrams to represent whole-number sums and differences within 20. (2.MD.6)
6. Draw a picture graph to represent data with up to 4 categories (including title, scale label, categories, category labels, and data) (2.MD.10)
7. Draw a bar graph to represent data with up to 4 categories (including title, scale label, categories, category labels, and data) (2.MD.10)
8. Solve put together, take-apart, and compare problems about information presented in bar graphs. (2.MD.10)

**Clusters/Standards:**

Represent and solve problems involving addition and subtraction.

2.OA.1 -- Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Add and subtract within 20.

2.OA.2 Fluently add and subtract within 20 using mental strategies. (See standard 1.OA.6 for a list of mental strategies.) By end of Grade 2, know from memory all sums of two one-digit numbers.

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

2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

**Math Practice Standards:**

Model with mathematics. In this unit, students are asked to transfer between manipulative, number line, drawings and other visual representations, applying these models to real-life situations. They are asked to communicate how their visuals are representing quantities and situations.

Use appropriate tools strategically: Students will know when to utilize measurement tools appropriately. These tools may include non-standard objects, rulers, and number lines.

Attend to precision: Students precisely represent and describe the process of transitioning from a word problem to a visual representation (equation, graph, model, number line, etc.) using accurate academic vocabulary.

Look for and make use of structure: Students will observe and replicate patterns (5s, 10s, and 100s) within our number system. While working in numbers in the base-ten domain, students work with the idea that ten 1s equal a 10 and ten 10s equal 100. In addition, they also make use of structure when they work with subtraction as missing addend problems, such as:  $50 - 33 = \underline{\quad}$  can be written as “ $33 + \underline{\quad} = 50$ ” How much more do I need to add to 33 to get to 50?” These problems will be presented within the various problem-solving structures.

Look for express regularity in repeated reasoning: Students will look for regularity in problem solving structures when solving mathematical tasks. For example, after solving two-digit addition problems by decomposing numbers ( $33 + 25 = 20 + 30 + 3 + 5$ ), students may begin to generalize and frequently apply that strategy independently on future tasks. Further, students begin to look for strategies to be more efficient in computations, including doubles strategies and making a ten. These problems will be presented within the various problem-solving structures.

### **WIDA Standards:**

English Language Learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics. English Language Learners will benefit from:

The use of visual tools such as number diagrams, tape diagrams, number lines, picture graphs, and bar graphs to represent and solve problems.

### **Academic Vocabulary:**

Critical Terms: Equation Quantity Solve Symbol Unknown Operation Place Value Properties of Addition  
Column Key

Supplemental Terms: Addition Subtraction Remainder Compare Sum Difference Length Distance Bar Graph  
Picture Graph Data Title Label

### **Student Learning Experiences / Tasks:**

Engage NY module  
Sprints/Number Bond Dash (fluency practice)  
Problem Sets  
Exit Tickets  
Homework

### **Assessments:**

#### **End of Unit Assessment**

[http://www.engageny.org/sites/default/files/resource/attachments/g2-m1-end-of-module\\_assessment.docx](http://www.engageny.org/sites/default/files/resource/attachments/g2-m1-end-of-module_assessment.docx)

**Instructional Resources:**

<http://www.engageny.org/resource/grade-2-mathematics-module-1>

U46 Curriculum  
2<sup>nd</sup> Grade Math

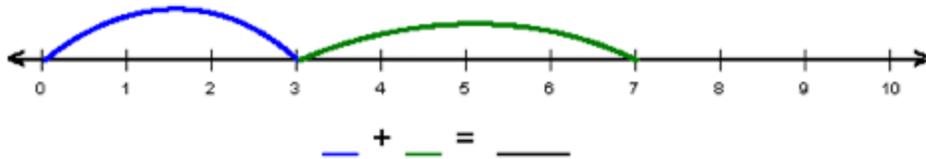
**Module 2 Addition and Subtraction of Length Units**

**Domain(s): Measurement and Data**

**Trimester(s): 2**

**Transfer: *Students will apply...***

1. Measurement concepts and skills to estimate and measure length appropriately and to represent that measurement in whole numbers.
2. Using those whole-number measurements, students will be able to represent addition and subtraction on a number line diagram, such as:



**Understandings: *Students will understand that...***

1. There is a relationship between estimation and measurement.
2. Measurement is a way to describe and compare objects or ideas.
3. A specific process is used to measure attributes of unit length.
4. A number line is used to represent measurement attributes such as, distance and quantity.

**Essential Question(s):**

1. When should you estimate and when do you need an exact answer?
2. What properties or attributes can be measured?
3. How do we measure (unit, tool, and process)?
4. How can accurate measurements help us to solve problems and make sense of our world?

**Knowledge: *Students will know...***

1. The standard tools for linear measurement.
2. The location of the beginning point of the appropriate standard measuring tool.
3. The names of taught length-units.

**Skill: *Students will be able to...***

1. Measure the length of an object by selecting and using appropriate standard tools. (2.MD.1)
2. Measure length of an object twice, using units of different lengths for the two measurements. (2.MD.2)
3. Describe how two measurements using different units relates to the size of the unit chosen. (2.MD.2)
4. Estimate lengths using units of inches, feet, centimeters and meters. (2.MD.3)

5. Check for reasonableness of estimates. (2.MD.3)
6. Compare objects visually, side by side, and measure the difference. (2.MD.4)
7. Express the difference between lengths in terms of a standard length unit. (2.MD.4)
8. Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the number 0, 1, 2. (2.MD.6)

### **Clusters/Standards:**

Measure and estimate lengths in standard units.

- 2.MD.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
- 2.MD.2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
- 2.MD.3 Estimate lengths using units of inches, feet, centimeters, and meters. Check for reasonableness of estimates.
- 2.MD.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

Relate addition and subtraction to length.

- 2.MD.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.
- 2.MD.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.

### **Math Practice Standards:**

Model with mathematics: Students will use concrete manipulatives to measure and represent distance and quantity. Real-life addition and subtraction situations will be modeled on a number line.

Use appropriate tools strategically: Students will know when to utilize measurement tools appropriately. These tools may include non-standard objects, rulers, and number lines.

Attend to precision: Students will use the measurement process precisely. For example when using non-standard objects to measure, students will understand units must be of equal size and maintain appropriate length/spacing between objects. However when using a ruler, students will show correct alignment of the zero-point.

Look for and make use of structure: Students will reconstruct the patterns within a measurement system by using the structure of the number line.

**WIDA Standards:**

English Language Learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.

English Language Learners will benefit from:

1. An awareness of different measurement vocabulary.
2. The use of visual tools such as rulers, number diagrams or number lines, and meter sticks.
3. An understanding of the universality of measurement.

**Academic Vocabulary:**

Critical Terms: measure estimate ruler meter stick measuring tapes number diagram number line inch foot centimeter meter  
Customary system metric system unit line plot linear sum difference equal

Supplemental Terms: shorter longer taller wider zero compare

**Student Learning Experiences / Tasks:**

Possible activities:

Measure lengths using objects representing standard length (centimeter cubes) and/or rulers and meter strips/sticks

Use ruler as number line to compare lengths and find answers to addition and subtraction problems involving measurements.

Create drawings of lines to specific lengths using rulers and/or cm. cubes as guides.

**Assessment**

End of Unit Assessment - [http://www.engageny.org/sites/default/files/resource/attachments/g2-m2-end-of-module\\_assessment.docx](http://www.engageny.org/sites/default/files/resource/attachments/g2-m2-end-of-module_assessment.docx)

**Instructional Resources:**

<http://www.engageny.org/resource/grade-2-mathematics-module-2>

**U46 Curriculum**  
**U-46 2<sup>nd</sup> Grade Math**

**Module 3 Place Value Counting and Comparing to 1000**

**Domain(s): Operations and Algebraic Thinking and  
Numbers in Base-Ten**

**Trimester(s): 1**

**Transfer: *Students will apply...***

Understanding of place value concepts to solve real-world and mathematical addition and subtraction problems involving lengths.

Take from Change unknown problem situation example: My teacher put 19 rulers on the desk. Some students borrowed a ruler and then there 12 remaining. How many students borrowed a ruler?  $19 - ? = 12$ .

**Understandings: *Students will understand that...***

1. Numbers are composed of other numbers.
2. Numbers can represent quantity, position, location and relationships.
3. Place value is based on groups of ten.
4. Flexible methods of computation involve grouping numbers in strategic ways.

**Essential Question(s):**

1. How can numbers be expressed, ordered and compared?
2. How does the position of a digit in a number affect its value?
3. In what ways can numbers be composed and decomposed?
4. What are efficient methods for finding sums and differences?

**Knowledge: *Students will know...***

1. The value of digits.
2. Place value names.
3. Basic addition and subtraction computation and problem solving strategies.
4. The properties of addition (commutative, associative, and identity.)
5. Quantity representations on a number line.

**Skill: *Students will be able to...***

1. Represent three digit numbers as amounts of hundreds, tens, and ones using manipulatives, pictures and words. (2.NBT.1)
2. Represent 100 as a bundle of ten tens using manipulatives, pictures and words. (2.NBT.1)

3. Represent 200, 300, 400, 500, 600, 700, 800, and 900 as the appropriate number of hundreds using manipulatives, pictures and words. (2.NBT.1)
4. Count within 1000 starting from any number. (2.NBT.2)
5. Skip-count by 5s, 10s and 100s. (2.NBT.2)
6. Read numbers to 1000. (2.NBT.3)
7. Write numbers to 1000 in standard form and expanded form. (2.NBT.3)
8. Write number names to 1000. (2.NBT.3)
9. Compare two three-digit numbers based on placed value of each digit. (2.NBT.4)
10. Use the symbols  $<$ ,  $=$ ,  $>$  correctly in comparisons. (2.NBT.4)

### **Clusters/Standards:**

#### **Understand place value.**

- 2.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
- a. 100 can be thought of as a bundle of ten tens – called a “hundred.”
  - b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
- 2.NBT.2 Count within 1000; skip-count by 5s, 10s and 100s.
- 2.NBT.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
- 2.NBT.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using  $>$ ,  $=$ , and  $<$  symbols to record the results of comparisons.

### **Math Practice Standards:**

Reason abstractly and quantitatively: Students demonstrate reasoning by explaining and modeling the value of numbers and by applying their knowledge of combinations to compute.

Model with mathematics: In this unit, students are asked to transfer between manipulative, number line, drawings and other visual representations, applying these models to real-life situations. They are asked to communicate how their visuals are representing quantities and situations.

Use appropriate tools strategically: Students demonstrate their ability to use various tools and models to represent quantities of addition and subtraction, including base-ten manipulatives, Digi-Blocks, number discs, etc.

Attend to precision: Students precisely represent and describe the process of transitioning from a word problem to a visual representation (equation, graph, model, number line, etc.) using accurate academic vocabulary.

Look for and make use of structure: Students will observe and replicate patterns (5s, 10s, and 100s) within our number system. While working in numbers in the base-ten domain, students work with the idea that ten 1s equal a 10 and ten 10s equal 100. In addition, they also make use of structure

when they work with subtraction as missing addend problems, such as:  $50 - 33 = \underline{\quad}$  can be written as “ $33 + \underline{\quad} = 50$ ” How much more do I need to add to 33 to get to 50?” These problems will be presented within the various problem-solving structures.

Look for express regularity in repeated reasoning: Students will look for regularity in problem solving structures when solving mathematical tasks. For example, after solving two-digit addition problems by decomposing numbers ( $33 + 25 = 20 + 30 + 3 + 5$ ), students may begin to generalize and frequently apply that strategy independently on future tasks. Further, students begin to look for strategies to be more efficient in computations, including doubles strategies and making a ten. These problems will be presented within the various problem-solving structures.

### **WIDA Standard:**

English Language Learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.

English Language Learners will benefit from:

1. The use of visual tools such as number diagrams, number lines, base-ten manipulatives, etc.
2. Visual representation of symbols on an Anchor chart.
3. Building decade numbers while simultaneously reading numbers aloud will reinforce the meanings of the quantities.

### **Academic Vocabulary:**

Critical Terms: Quantity Symbol Operation Place Value Properties of Addition Column Digit Place Value Commutative Associative Identity Base-ten Ones Tens Hundreds

Supplemental Terms: Addition Subtraction Compare Sum Difference Remainder Represent Mental math

### **Student Learning Experiences / Tasks:**

#### **From Engage NY Module**

Use place value mats and number discs (colored “chips” in three different colors, ones=green, tens = blue, hundreds =red) to model numbers

Use play money \$1, \$10, \$100 bills (can also use pennies, dimes, one-dollar bills) to model numbers

Use marker boards to write numbers to/from expanded, standard, and word form

### **Assessments**

Mid-Unit Assessment [http://www.engageny.org/sites/default/files/resource/attachments/g2-m3-mid-module\\_assessment.docx](http://www.engageny.org/sites/default/files/resource/attachments/g2-m3-mid-module_assessment.docx)

End of Unit Assessment [http://www.engageny.org/sites/default/files/resource/attachments/g2-m3-end-of-module\\_assessment.docx](http://www.engageny.org/sites/default/files/resource/attachments/g2-m3-end-of-module_assessment.docx)

**Instructional Resources:**

<http://www.engageny.org/resource/grade-2-mathematics-module-3>

## U46 Math Curriculum Second Grade

### Module 4 – Addition and Subtraction Within 200 with Word Problems to 100

Domain(s): Operations and Algebraic Thinking (OA); Number and Operations in Base-Ten (NBT)

Trimester(s): 1 and 2

#### Transfer: *Students will apply...*

1. Students will apply addition and subtraction concepts and skills to addition to 200.
2. Using those whole-number measurements, students will be able to represent addition and subtraction on a number line diagram.
3. Students will create and interpret picture and bar graphs to solve simple problems.
4. Result Unknown problem situation example: Five toy cars were on the table. My brother borrowed 3 of them. How many toy cars remain?  $5 - 3 = ?$
5. Change Unknown problem situation example: 32 students were in the cafeteria. Some left and now there are 27 students in the cafeteria. How many students left the cafeteria?  $32 - ? = 27$
6. Start Unknown problem situation example: The Marcus family picked some oranges. They gave 16 to their neighbor and kept the rest for themselves. If they kept 26 oranges, how many did they have to start?
7. Understanding of place value concepts to solve real-world and mathematical addition and subtraction problems involving lengths.
8. Take from Change unknown problem situation example: My teacher put 19 rulers on the desk. Some students borrowed a ruler and then there 12 remaining. How many students borrowed a ruler?  $19 - ? = 12$ .

#### Understandings: *Students will understand that...*

1. Numbers are composed of other numbers.
2. There are different problem solving structures which can be used to solve problems in multiple ways.
3. Unknown quantities can be represented in different places in an equation/number model.
4. Addition and subtraction can be represented on various models such as number lines, picture graphs, and bar graphs.
5. Numbers can represent quantity, position, location and relationships.
6. Place value is based on groups of ten.
7. Flexible methods of computation involve grouping numbers in strategic ways.

#### Essential Question(s):

1. How do composing and decomposing numbers lead to understanding word problems?
2. How can numbers be put together and taken apart to solve problems?
3. How does an equation represent an unknown quantity?
4. How do visual representations depict addition and subtraction?
5. How can numbers be expressed, ordered and compared?
6. How does the position of a digit in a number affect its value?

7. In what ways can numbers be composed and decomposed?
8. What are efficient methods for finding sums and differences?

**Knowledge: *Students will know...***

1. Basic addition and subtraction computation and problem solving strategies.
2. The properties of addition (commutative, associative, and identity.)
3. The value of digits.
4. Place value names.
5. Quantity representations on a number line.

**Skill: *Students will be able to do...***

1. Solve one-step word problems within 100 involving situations of adding to, taking from, putting together, taking apart, and comparing involving results unknown, change unknown, and start unknown using objects, drawings, and equations with a symbol for the unknown number. (2.OA.1)
2. Solve two-step word problems within 100 involving situations of adding to, taking from, putting together, taking apart, and comparing problems involving results unknown, change unknown, and start unknown using objects, drawings, and equations with a symbol for the unknown number. (2.OA.1)
3. Fluently add and subtract within 20. (2.OA.2)
4. Fluently add within 200 using strategies based on place value, properties of operations and/or the relationship between addition and subtraction. (2.NBT.5)
5. Add up to four 2-digit numbers using strategies based on place value and properties of operations. (2.NBT.6)
6. Add and subtract within 1000 using models, drawings, operation properties and/or the relationship between addition and subtraction using base 10 strategies. (2.NBT.7)
7. Relate the chosen strategy and explain the reasoning used. (2.NBT.7)
8. Mentally add 10 or 100 to a number between 100 and 900. (2.NBT.8)
9. Mentally subtract 10 or 100 to a number between 100 and 900. (2.NBT.8)
10. Explain why addition and subtraction strategies work by applying knowledge of place value and the properties of operations using concrete objects, pictures and words (both oral and written). (2.NBT.9)

**Clusters/Standards:**

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

2.OA.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

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

2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.

2.NBT.7 Add and subtract within 1000, 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. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

2.NBT.8 Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.

2.NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations. (Explanations may be supported by drawings or objects.)

### **Mathematical Practice Standards:**

1. Reason abstractly and quantitatively. Students demonstrate reasoning by explaining and modeling the value of numbers and by applying their knowledge of combinations to compute.
2. Model with mathematics. In this unit, students are asked to represent computation by transferring between manipulative, number line, drawings and other visual representations, applying these models to real-life situations involving length. They are asked to communicate how their visuals are representing place value of the quantities and situations.
3. Use appropriate tools strategically. Students demonstrate their ability to use various models to represent place value.
4. Attend to precision. Students precisely represent and describe the application of place value within the process of computation using accurate academic vocabulary.
5. Look for and make use of structure. Students will observe and replicate patterns (5s, 10s, and 100s) within our number system. While working in numbers in base ten domain, students work with the idea that ten 1s equals a 10 and ten 10s equals 100. In addition, they also make use of place value structure when they work with addition and subtraction.
6. Look for express regularity in repeated reasoning. Students will look for regularity in problem solving structures when solving mathematical tasks. For example, students will apply single-digit facts to two-digit computation. They will use the structure of tens and hundreds to represent and solve addition and subtraction.

### **WIDA Standards:**

English Language Learners will benefit from:

1. The use of visual tools such as number diagrams, number lines, base-ten manipulatives, etc.
2. Visual representation of symbols on an anchor chart.
3. Build decade numbers while simultaneously reading numbers aloud will reinforce the meanings of the quantities.

## Academic Vocabulary:

### Critical Terms:

Digit Quantity Solve Symbol Operation Place Value  
Properties of Addition Commutative Associative Identity  
Base-ten Ones Tens Hundreds

### Supplemental Terms:

Addition Subtraction Remainder Compare Sum Difference  
Represent Mental math

### Student Learning Experiences / Tasks:

Exit Tickets  
Problem Sets

### Assessment

Mid Unit Assessment - [http://www.engageny.org/sites/default/files/resource/attachments/g2-m4-mid-module\\_assessment.docx](http://www.engageny.org/sites/default/files/resource/attachments/g2-m4-mid-module_assessment.docx)

End of Unit Assessment - [http://www.engageny.org/sites/default/files/resource/attachments/g2-m4-end-of-module\\_assessment.docx](http://www.engageny.org/sites/default/files/resource/attachments/g2-m4-end-of-module_assessment.docx)

### Instructional Resources:

<http://www.engageny.org/sites/default/files/resource/attachments/a-story-of-units-a-curriculum-overview-and-map-for-grades-p-5.pdf>

**U46 Math Curriculum  
Second Grade**

**Module 5 : Addition and Subtraction Within 1000 with Word Problems to 100**

**Domain(s): Operations and Algebraic Thinking / Numbers in Base Ten**

**Trimester(s): 2**

**Transfer: *Students will apply...***

1. Understanding of place value concepts to solve real-world and mathematical addition and subtraction problems involving lengths.
2. Take from Change unknown problem situation example: My teacher put 19 rulers on the desk. Some students borrowed a ruler and then there were 12 remaining. How many students borrowed a ruler?  $19 - ? = 12$ .

**Understandings: *Students will understand that...***

1. Numbers are composed of other numbers.
2. Numbers can represent quantity, position, location and relationships.
3. Place value is based on groups of ten.
4. Flexible methods of computation involve grouping numbers in strategic ways.

**Essential Question(s):**

1. How can numbers be expressed, ordered and compared?
2. How does the position of a digit in a number affect its value?
3. In what ways can numbers be composed and decomposed?
4. What are efficient methods for finding sums and differences?

**Knowledge: *Students will know...***

1. The value of digits.
2. Place value names.
3. Basic addition and subtraction computation and problem solving strategies.
4. The properties of addition (commutative, associative, and identity.)
5. Quantity representations on a number line.

**Skill: *Students will be able to...***

1. Add and subtract within 1000 using models, drawings, operation properties and/or the relationship between addition and subtraction using base 10 strategies. (2.NBT.7)
2. Relate the chosen strategy and explain the reasoning used. (2.NBT.7)
3. Mentally add 10 or 100 to a number between 100-900. (2.NBT.8)

4. Mentally subtract 10 or 100 to a number between 100-900. (2.NBT.8)
5. Explain why addition and subtraction strategies work by applying knowledge of place value and the properties of operations using concrete objects, pictures and words (both oral and written). (2.NBT.9)

### **Clusters/Standards:**

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

**2.NBT.7** Add and subtract within 1000, 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. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

**2.NBT.8** Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.

**2.NBT.9** Explain why addition and subtraction strategies work, using place value and the properties of operations. (Explanations may be supported by drawings or objects.)

### **Mathematical Practice Standards:**

1. Reason abstractly and quantitatively. Students demonstrate reasoning by explaining and modeling the value of numbers and by applying their knowledge of combinations to compute.
2. Model with mathematics. In this unit, students are asked to represent computation by transferring between manipulative, number line, drawings and other visual representations, applying these models to real-life situations involving length. They are asked to communicate how their visuals are representing place value of the quantities and situations.
3. Use appropriate tools strategically. Students demonstrate their ability to use various models to represent place value.
4. Attend to precision. Students precisely represent and describe the application of place value within the process of computation using accurate academic vocabulary.
5. Look for and make use of structure. Students will observe and replicate patterns (5s, 10s, and 100s) within our number system. While working in numbers in base ten domain, students work with the idea that ten 1s equals a 10 and ten 10s equals 100. In addition, they also make use of place value structure when they work with addition and subtraction.
6. Look for express regularity in repeated reasoning. Students will look for regularity in problem solving structures when solving mathematical tasks. For example, students will apply single-digit facts to two-digit computation. They will use the structure of tens and hundreds to represent and solve addition and subtraction.

### **WIDA Standards:**

English Language Learners will benefit from:

1. The use of visual tools such as number diagrams, number lines, base-ten manipulatives, etc.
2. Visual representation of symbols on an Anchor chart.
3. Build decade numbers while simultaneously reading numbers aloud will reinforce the meanings of the quantities.

## Academic Vocabulary:

### Critical Terms:

Digit Quantity Solve Symbol Operation Place Value  
Properties of Addition Commutative Associative Identity  
Base-ten Ones Tens Hundreds

### Supplemental Terms:

Addition Subtraction Remainder Compare Sum Difference  
Represent Mental math

### Student Learning Experiences / Tasks:

From Engage NY module

Modeling and “bundling” groups of smaller units to make larger (bundling groups of ones to make tens, tens to make 100s, etc.)

Mental Math strategies for addition and subtraction

Using Arrow method/drawing

Number Bond Dashes / Sprints (for fluency)

### Assessment Resources

Mid Unit Assessment - <http://www.engageny.org/sites/default/files/resource/attachments/g2-m5-mid-module-assessment.docx>

End of Unit - <http://www.engageny.org/sites/default/files/resource/attachments/g2-m5-end-of-module-assessment.docx>

### Instructional Resources:

<http://www.engageny.org/resource/grade-2-mathematics-module-5>

**U46 Math Curriculum  
Second Grade**

**Module 6 – Foundations of Multiplication and Division**

**Domain(s): Operations and Algebraic Thinking (OA); Geometry (G)**

**Trimester(s): 3**

**Transfer: *Students will apply...***

1. Modeling of equal groups and create arrays (divide rectangles into equal-sized squares) as a precursor to multiplication.
2. Written equations to show an even number as a sum of two equal addends.
3. Even and odd numbers to real-world situations.

**Understandings: *Students will understand that...***

1. Flexible methods of computation involve grouping numbers in strategic ways. (Equations for even numbers with equal-sized addends.)
2. Even numbered objects can be modeled using pairs or rectangular arrays.
3. Rectangles can be composed or decomposed from/into equal-sided squares to model repeated addition.

**Essential Question(s):**

1. What are efficient methods for finding sums and differences using even and odd properties of numbers?
2. How can repeated addition be represented?
3. What are some characteristics of whole numbers?

**Knowledge: *Students will know...***

1. Place value names.
2. Multiplication as repeated addition.
3. Division as repeated subtraction.
4. Basic multiplication and division computation and problem solving strategies.
5. The properties of multiplication (commutative, associative, and identity).
6. The relationship between multiplication and division fact families.

**Skill: *Students will be able to...***

Determine if a group of objects, up to 20, is odd or even. (2.OA.3)

Justify answers (odd or even). (2.OA.3)

Write an equation to represent an even number as the sum of 2 equal addends. (2.OA.3)

Find the total number of objects arranged in rectangular arrays (up to 5 by 5) by

using repeated addition. (2.OA.4)

Write the equation to represent the repeated addition. (2.OA.4)

Section a rectangle into same size squares creating rows and columns. (2.G.2)

### Clusters/Standards:

#### Work with equal groups of objects to gain foundations for multiplication.

2.OA.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.

2.OA.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

#### Reason with shapes and their attributes.

2.G.2 Partition a rectangle into rows and columns of same size squares and count to find the total number of them.

### Mathematical Practice Standards:

1. Model with mathematics. In this unit, students are asked to transfer between the various modalities and model equal groups with tiles or drawings. They are asked to communicate how their visuals are representing even and odd quantities and situations. They also represent arrays with objects and addition equations.
2. Look for and make use of structure. Students will observe and connect arrays of objects to repeated addition and ultimately multiplication. They will examine the structures of both even and odd numbers to discover distinguishing features of each.

### WIDA Standards:

English Language Learners will benefit from:

- Concrete models of rectangular arrays to model even and odd quantities.

### Academic Vocabulary:

#### Critical Terms:

odd even remainder equal groups pair equal addend row  
column doubles

#### Supplemental Terms:

equation

### Student Learning Experiences / Tasks:

Exit Tickets

Problem Sets

### Assessment

Mid-Unit Assessment: <http://www.engageny.org/sites/default/files/resource/attachments/math-g2-m6-mid-module-assessment.docx>

End of Unit Assessment: <http://www.engageny.org/sites/default/files/resource/attachments/math-g2-m6-end-of-module-assessment.docx>

**Instructional Resources:**

<http://www.engageny.org/sites/default/files/resource/attachments/a-story-of-units-a-curriculum-overview-and-map-for-grades-p-5.pdf>

**U46 Curriculum**  
**U-46 2<sup>nd</sup> Grade Mathematics**

**Module 7– Problem Solving with Length, Money, and Data**

**Domain(s): Measurement and Data**

**Trimester(s): 2<sup>nd</sup> and 3rd**

**Transfer: *Students will apply...***

1. Students will apply measurement concepts and skills to estimate and measure length appropriately and to represent that measurement in whole numbers.
2. Students will apply addition and subtraction concepts and skills to addition to 1000.
3. Using those whole-number measurements, students will be able to represent addition and subtraction on a number line diagram.
4. Students will create and interpret picture and bar graphs to solve simple problems using:
  - \*Result Unknown problem situation example: Five toy cars were on the table. My brother borrowed 3 of them. How many toy cars remain?  
 $5 - 3 = ?$
  - \*Change Unknown problem situation example: 32 students were in the cafeteria. Some left and now there are 27 students in the cafeteria. How many students left the cafeteria?  $32 - ? = 27$
  - \*Start Unknown problem situation example: The Marcus family picked some oranges. They gave 16 to their neighbor and kept the rest for themselves. If they kept 26 oranges, how many did they have to start?  $? - 16 = 26$

**Understandings: *Students will understand that...***

1. There is a relationship between estimation and measurement.
2. Measurement is a way to describe and compare objects or ideas.
3. A specific process is used to measure attributes of unit length.
4. A number line is used to represent measurement attributes such as, distance and quantity.
5. Numbers are composed of other numbers.
6. There are different problem solving structures which can be used to solve problems in multiple ways.
7. Unknown quantities can be represented in different places in an equation/number model.
8. Addition and subtraction can be represented on various models such as number lines, picture graphs, and bar graphs.
- 9.

**Essential Question(s):**

1. What properties or attributes can be measured?
2. How do we measure (unit, tool, and process)?
3. How can accurate measurements help us to solve problems and make sense of our world?
4. How do composing and decomposing numbers lead to understanding word problems?
5. How can numbers be put together and taken apart to solve problems?
6. How does an equation represent an unknown quantity?

7. How do visual representations depict addition and subtraction?

**Knowledge: *Students will know...***

1. The standard tools for linear measurement.
2. The location of the beginning point of the appropriate standard measuring tool.
3. Length-units.
4. Basic addition and subtraction computation and problem solving strategies.
5. The properties of addition (commutative, associative, and identity.)

**Skill: *Students will be able to...***

Measure the length of an object by selecting and using appropriate standard tools. (2.MD.1)

Measure length of an object twice, using units of different lengths for the two measurements. (2.MD.2)

Describe how two measurements using different units relates to the size of the unit chosen. (2.MD.2)

Estimate lengths using units of inches, feet, centimeters and meters. (2.MD.3)

Check for reasonableness of estimates. (2.MD.3)

Compare objects visually, side by side, and measure the difference. (2.MD.4)

Express the difference between lengths in terms of a standard length unit. (2.MD.4)

Write an equation using a symbol for the unknown number to represent the problem. (2.MD.5)

Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the number 0, 1, 2. (2.MD.6)

Represent whole-number sums and differences within 100 on a number line diagram. (2.MD.6)

Generate measurement data by measuring lengths of several objects to the nearest whole unit or by making repeated measurements of the same object. (2.MD.9)

Show measurement data by making a line plot, where the horizontal scale is marked off in whole-number units. (2.MD.9)

Draw a picture graph to represent data with up to 4 categories (including title, scale label, categories, category labels, and data) (2.MD.10)

Draw a bar graph to represent data with up to 4 categories (including title, scale label, categories, category labels, and data) (2.MD.10)

Solve put together, take-apart, and compare problems about information presented in a bar graph. (2.MD.10)

**Clusters/Standards:**

**2.MD.1** Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

**2.MD.2** Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.

**2.MD.3** Estimate lengths using units of inches, feet, centimeters, and meters.

**2.MD.4** Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

**Relate addition and subtraction to length.**

**2.MD.5** Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problems.

**2.MD.6** Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.

**Work with time and money.**

**2.MD.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?*

**Represent and interpret data.**

**2.MD.9** Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

**2.MD.10** Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems (See Glossary, Table 1.) using information presented in a bar graph.

**Mathematical Practice Standards:**

1. Model with mathematics. Students will use concrete manipulatives to measure and represent distance and quantity. Real-life addition and subtraction situations will be modeled on a number line.
2. Use appropriate tools strategically. Students will know when to utilize measurement tools appropriately. These tools may include non-standard objects, rulers, and number lines.
3. Attend to precision. Students will use the measurement process precisely. For example when using non-standard objects, students will understand units must be of equal size and maintain appropriate length-until iteration. However when using a ruler, students will show correct alignment of the zero-point.
4. Look for and make use of structure. Students will reconstruct the patterns within a measurement system by using the structure of the number line.

**WIDA Standards:**

English Language Learners will benefit from:

1. An awareness of different measurement vocabulary.
2. The use of visual tools such as rulers, number diagrams or number lines, and meter sticks.
3. An understanding of the universality of measurement.

**Academic Vocabulary:**

**Critical Terms:**

measure estimate ruler meter stick measuring tapes  
number diagram number line inch foot centimeter meter  
customary system metric system unit line plot linear sum  
difference equal graph title vertical axis horizontal axis  
axis labels graph scale

**Supplemental Terms:**

shorter longer taller wider zero compare

**Student Learning Experiences / Tasks:**

Reading and constructing bar graphs (single unit scale)

Using manipulative clocks to tell and “make” given time

Match digital and analog clock faces

Using “play” money/coins to make given amounts of money and/or solve problems involving money (e.g. change from \$1)

Measuring objects in room with variety of tools (rulers, yard/meter sticks, measuring tape)

“Number Dash” drills may include: Filling in missing numbers or hands on analog clock face, filling in missing numbers to rulers, matching/comparing standard unit measures (e.g. 3 ft. = \_\_\_ yd), matching coins to values, matching digital to analog clock faces, etc.

**Assessment**

Mid-Unit Assessment: <http://www.engageny.org/sites/default/files/resource/attachments/math-g2-m7-mid-module-assessment.docx>

End of Unit Assessment: <http://www.engageny.org/sites/default/files/resource/attachments/math-g2-m7-end-of-module-assessment.docx>

**Instructional Resources:**

<http://www.engageny.org/sites/default/files/resource/attachments/a-story-of-units-a-curriculum-overview-and-map-for-grades-p-5.pdf>

**U46 Curriculum**  
**U-46 2<sup>nd</sup> Grade Math**

**Module 8 – Time, Shapes, and Fractions as Equal Parts of Shapes**

**Domain(s): Geometry, Numbers Base-Ten, Measurement/Data**

**Trimester(s): 3rd**

**Transfer: *Students will apply...***

1. Understanding of a.m. and p.m. to real world problem solving situations.
2. Telling time to five minutes using analog and digital clocks.
3. Using whole number measurements, students will be able to represent time on a number line diagram, i.e. analog clock.
4. “Add to start” unknown problem situation example: The Morales family wanted to be at the movie theater at 2:55 for the new show. It takes them 35 minutes to get to the theater. What time should they leave home? ( $? + 35 = 2:55$ )
5. Knowledge of shapes to recognize, identify, and draw various shapes based upon attributes.

**Understandings: *Students will understand that...***

1. Time can be measured.
2. Standard units provide common language for communicating time.
3. Equivalent periods of units are used to measure time
4. Objects can be described and compared using their geometric attributes.

**Essential Question(s):**

1. How do units within a system relate to each another?
2. How are various representations of time related?
3. How can plane and solid shapes be described?

**Knowledge: *Students will know...***

1. The standard tools for time measurement
2. The concept of hours and minutes
3. Properties of polygons.
4. Names of shapes.
5. Geometric vocabulary (see below)

**Skill: *Students will be able to do...***

1. Tell time using analog and digital clocks to the nearest 5 minutes (2.MD.7)
2. Write time using analog clocks and digital clocks(2.MD.7)
3. Identify and label when a.m. and p.m. occur (2.MD.7)
4. Skip count by 5s, 10s, and 100s. (2.NBT,2)
5. Section circles and rectangles into 2, 3, or 4 equal parts. (2.G.3)
6. Describe the parts of the shape as halves, thirds, and fourths. (2.G.3)

7. Identify the combinations of the whole (2 halves = 1 whole, etc...). (2.G.3)
8. Use manipulatives, pictures and words to show that equal sized sections of the same whole need not have the same shape. (2.G.3)
9. Identify shapes that have specified attributes. (2.G.1)
10. Draw shapes that have specified attributes. (2.G.1)
12. Identify triangles, quadrilaterals, pentagons, hexagons and cubes. (2.G.1)

### **Clusters/Standards:**

Work with time and money.

2.MD.7 Tell time and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

Reason with shapes and their attributes.

2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. (Sizes are compared directly or visually, not compared by measuring.)

Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

2.G.3 Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc. and describe the whole as two halves, three thirds, and four fourths

Recognize that equal shares of identical wholes need not have the same shape. (e.g. "fourths" can be made by splitting in half and half again diagonally as well as horizontally/vertically, or can look like a striped pattern)

### **Math Practice Standards**

Model with mathematics: Students will use concrete manipulatives to measure, tell and represent time. Real-life time measurement situations will be modeled on a number line diagram/analog clock. Students are asked to use various modalities and model shapes with manipulatives or drawings. They are asked to communicate how their visuals represent these shapes.

Use appropriate tools strategically: Students will know how to utilize measurement tools to determine and represent time. These tools may include number line diagrams/analog clocks and digital clocks.

Attend to precision: Students will use the time measurement process precisely. For example when using analog clocks, students will understand units must be of equal size.

Look for and make use of structure: Students will reconstruct the patterns within a time measurement system by using the structure of the number line as it correlates to an analog clock. Students will observe, identify, and categorize shapes based upon attributes.

### **WIDA Standard (English Language Learners)**

English Language Learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.

English Language Learners will benefit from:

An awareness of different time measurement vocabulary.

The use of visual tools such as number diagrams/analog clocks and digital clocks.

Time interval number labels.

An understanding of the universality of measurement.

Concrete models of various shapes

Repetitive practice of vocabulary using varied, hands-on activities that involve labeled, concrete manipulatives.

### **Student Learning Experiences / Tasks:**

Using / comparing analog and digital clocks to solve problems

Use geometric blocks to identify shapes and/or use small equal sized shapes to create larger “fractioned” shapes

Use fraction manipulatives (circles, bars, etc.) to compare fractions

Draw pictures/representations of various fractions

### **Assessment**

Mid-Unit Assessment: <http://www.engageny.org/sites/default/files/resource/attachments/math-g2-m8-mid-module-assessment.docx>

End of Unit Assessment: [http://www.engageny.org/sites/default/files/resource/attachments/math-g2-m8-end-of-module\\_assessment.docx](http://www.engageny.org/sites/default/files/resource/attachments/math-g2-m8-end-of-module_assessment.docx)

### **Academic Vocabulary**

**Critical terms** unit hour half-hour minute measure whole a.m./p.m. clock attribute triangle quadrilateral pentagons hexagon cubes side angle straight flat solid corner edge

**supplemental terms:** clock digital analog number line interval skip-count half halves third(s) fourth(s) dimensional polygon circle square rectangle rhombus trapezoid septagon octagon plane vertex/vertices

### **Instructional Resources:**

Engage NY <http://www.engageny.org/sites/default/files/resource/attachments/a-story-of-units-a-curriculum-overview-and-map-for-grades-p-5.pdf>