Curriculum Overview
Mathematics – Grade Two (Course #5012040)

Adopted Instructional Materials: *Houghton Mifflin Harcourt, Go Math!*

Big Idea 1 Place Value to One Thousand	Big Idea 2 Basic Facts Add/Sub	Big Idea 3 Two-Digit Add/Sub	Big Idea 4 Three-Digit Add/Sub	Big Idea 5 Money	Big Idea 6 Time	Big Idea 7 Measuring Length	Big Idea 8 Data Collections & Representations	Big Idea 9 Geometry and Fractions	Big Idea 10 Mastery of Grade 2
Chapters 1 & 2	Chapter 3	Chapters 4 & 5	Chapter 6	Chapter 7 (Partial)	Chapter 7 (Partial)	Chapters 8 & 9	Chapter 10	Chapter 11	Critical Areas
Quarter 1		Quarter 2		Quarter 3		Quarter 4			

Big Ideas in red shading denote critical areas for 2nd grade. An explanation of the critical areas is provided in the Mathematical Content Standards below.
Big Ideas in blue shading denote supporting areas for 2nd grade. These Big Ideas are essential to future critical areas within and across grade levels.

Curriculum Notes:

- Mathematical Content Standards: In Grade 2, instructional time should focus on four critical areas: (1) extending understanding of base-ten notation; (2) building fluency with addition and subtraction; (3) using standard units of measure; and (4) describing and analyzing shapes. Standards which are part of Major Clusters are denoted by an asterisk. When determining summative grades for mathematics, these standards should be considered with more weight than those standards which are not part of Major Clusters.
    - (1) Students extend their understanding of the base-ten system. This includes ideas of counting by fives, tens, and multiples of hundreds, tens, and ones, as well as number relationships involving these units, including comparing. Students understand multi-digit numbers (up to 1000) written in base-ten notation, recognizing that the digits in each place represent amounts of thousands, hundreds, tens, or ones(e.g.,853 is 8 hundreds + 5 tens + 3 ones).
    - (2) Students use their understanding of addition to develop fluency with addition and subtraction within 100.They solve problems within 1000 by applying their understanding of models for addition and subtraction, and they develop, discuss, and use efficient, accurate, and generalizable methods to compute sums and differences of whole numbers in base-ten notation, using their understanding of place value and the properties of operations. They select and accurately apply methods that are appropriate for the context and the numbers involved to mentally calculate sums and differences for numbers with only tens or only hundreds.
    - (3) Students recognize the need for standard units of measure (centimeter and inch) and they use rulers and other measurement tools with the understanding that linear measure involves an iteration of units. They recognize that the smaller the unit, the more iterations they need to cover a given length.
    - (4) Students describe and analyze shapes by examining their sides and angles. Students investigate, describe, and reason about decomposing and combining shapes to make other shapes. Through building, drawing, and analyzing two-and three-dimensional shapes, students develop a foundation for understanding area, volume, congruence, similarity, and symmetry in later grades.

- Standards for Mathematical Practice: The teacher's role in the development of students' proficiency of mathematical practice across all content standards is essential.
    - The teacher creates daily opportunities and establishes classroom norms that allow students to:
        - develop mathematical understanding from prior knowledge
        - build connections
        - foster each student's accountability to think, reason, and explain
    - Students must be shown how to apply the mathematical practices to new content.
    - It is through dialogue and discussion of different strategies that students become knowledgeable, independent learners.
    - While the Standards for Mathematical Practice are woven throughout mathematics instruction, the Grade 2 Academic Plan indicates the focused Standards for Mathematical Practice for each Big Idea of instruction.
    - Mathematical Practice Resources: Implementing Math Practices, Mathematical Practices Progression, Mathematical Practice Question Stems

- Additional Resource: Achieve the Core Go Math Guidance Documents
    - **Please use as additional support and guidance keeping in mind this does not address Florida's amended standards. Please use your MAFS when using this resource.**

Big Idea 1
Quarter 1

Academic Plan
Mathematics – Grade Two (Course #5012040)
2nd Grade Math CCE Blueprint

Suggested Big Idea Length:
26 – 30 days

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Place Value to One Thousand*

Quarter one of second grade focuses on developing students' understanding of place value to 1,000. It is important for students to understand that the three digits of a three-digit number represent hundreds, tens, and ones. One hundred can be thought of as a bundle of tens called a hundred. Students should be able to: skip count by 5's, 10's, and 100's to 1,000, write numbers to 1,000, use base-ten numerals, read and write number names, show numbers in expanded form, be able to use >, <, and = symbols to compare two three-digit numbers, and mentally add and subtract 10 or 100 to a given number. Students should also be able to determine whether a group of objects is even or odd.

Manipulatives: Below are some of the manipulatives that should be included in the instruction of Big Idea 1. View the attached document, Grade 2 Big Idea 1 Manipulatives, for a comprehensive list of manipulatives and their suggested usage during Big Idea 1.

- Base-Ten Blocks
- Connecting Cubes
- Hundred Chart
- Place Value Chart
- Ten Frames

Teacher Note:

Additional days have been included in Big Idea 1 to foster development of classroom routines and procedures to create an environment of collaboration and community.

Begin your math journals on day one; students should have math journal writing daily/weekly. Students should keep a math journal for daily/weekly problems that encourage students to justify their thinking, illustrate new math vocabulary, and/or can identify a specific concept in the real-world.

Standards

Math Content Standards	Cross Content Standards
MAFS.2.OA.3.3: 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. **MAFS.2.NBT.1.1:** 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).	**LAFS.2.SL.1.1:** Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). b. Build on others' talk in conversations by linking their comments to the remarks of others. c. Ask for clarification and further explanation as needed about the topics and texts under discussion.

MAFS.2.NBT.1.2:	Suggested Standards for Mathematical Practice
Count within 1000; skip-count by 5s, 10s, and 100s. **MAFS.2.NBT.1.3:** Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. **MAFS.2.NBT.1.4:** Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons. **MAFS.2.NBT.2.8:** Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.	**MAFS.K12.MP.3.1:** Construct viable arguments and critique the reasoning of others. • How do you know that a number is even or odd? • Do you agree or disagree with your partner? Why? • How do you know you are skip counting by 5's, 10's, or 100's in a pattern? **MAFS.K12.MP.8.1:** Look for and express regularity in repeated reasoning. • Can we write all even numbers as the sum of two equal addends? • What might be a strategy for remembering what is even or odd? • What happens when you expand a number? • What happens when you change the value of a number by 5's, 10's, or 100's?

Big Idea(s)

Place Value to One Thousand

Essential Outcome Question(s)

- How do you use place value to find the values of numbers and describe numbers in different ways?
- How can you use place value to model, write, and compare three-digit numbers?

Conceptual Understandings	**Essential Question(s)**
• A numeral has a different value based upon its placement in a number. • It is important to develop flexible thinking about numbers. Visualizing numbers in a variety of ways helps us understand the size of numbers and develop the meaning of numbers. This also helps us work with numbers mentally. • Numbers may be represented in a variety of ways such as base-ten blocks, diagrams, number lines, and expanded form. • We must understand place value so that we can apply it to compare and order larger numbers.	• How do you know the value of a digit? • What are some different ways to model/show a number? • How do you count by ones, fives, tens, and hundreds? • How can you write a three-digit number in different ways? • How can place value help you compare three-digit numbers?

Aligned Learning Goals		District Adopted Materials	Supplemental Resources	Strategies for Differentiation
Understanding the Value of Numbers to 1,000. 22 content + 1 progress monitoring check	Identify even and odd numbers up to 20 *(OA.3.3)*	Go Math! Chapter 1 & Chapter 2 Achieve the Core Go Math Guidance Documents	• Task Card: HELLO • K-5 Math Resource: Even Odd Scoop • CPALMS: Framing Odd and Even Numbers to Make and Even Odd Street • CPALMS: Popsicle Place Value • Illuminations: Expand That Number!	Reteach & Enrichment Support: Understanding the Value of Numbers to 1,000 The above document provides opportunities for reteach and enrichment with the current aligned learning goal.
	Count within one-thousand; skip count by 5's, 10's and 100's *(NBT.1.2)*			
	Identify the value of a digit in a three-digit number *(NBT.1.3)*			
	Use models to represent three-digit numbers *(NBT.1.3)*			
	Demonstrate different ways to identify and write three-digit numbers using word, standard, and expanded form *(NBT.1.3)*			
	Mentally add and subtract 10 or 100 to a given number (isolated or in a pattern) *(NBT.1.2, NBT.2.8)*			
Comparing 3-Digit Numbers 4 content + 1 progress	Use models to compare three-digit numbers *(NBT.1.1)*	Go Math! Chapter 2 Achieve the Core Go Math Guidance Documents	• Task Card: Road Trip FL Primary • CPALMS: Less Could Be More!	Reteach & Enrichment Support: Comparing 3-Digit Numbers The above document provides opportunities for reteach and enrichment with the current aligned learning goal.
	Compare three-digit numbers using the <, >, and = symbols *(NBT.1.4)*			

Instructional Strategies and Resources

Student's initial exploration of even and odd numbers should include the use of manipulatives and mathematical representations so that students understand what even and odd mean.

- Students count out cubes to show a number and put those cubes into pairs.
- If a number is even, all of the cubes will be set in pairs. If the number is odd, there is an extra cube – one that is not paired.
- When children look at a 2-digit number to see if it is odd or even, they need to only look at the digit in the ones place.
- Students should recognize that even numbers can be shown either as pairs (groups of two) with nothing left over or as two equal groups.
- Students should have ample experience in exploring the concept that if a number can be decomposed into two equal addends (10=5+5), then the number is an even number. This is building the foundation students will need to understand the concept of multiplication.

Students extend their understanding of the base-ten system by viewing 10 tens as forming a new unit, a hundred.

- Model a 3-digit number with base-ten blocks; building an understanding that a 3-digit number can be named in its expanded form as the sum of its hundreds, tens and ones.
- Children visualize numbers so that they can understand that the value of a number changes its value depending on its place.
- Representing numbers flexibly prepares children to make sense of adding and subtracting multi-digit numbers where regrouping is required.
- Comparison of 3-digit numbers draws on the understanding that 1 hundred is greater than any amount of tens and ones.
- Comparison of 3-digit numbers should also include the use of a number line.

Students begin to explore counting patterns by using a hundreds chart.

- Students need to understand what numbers they start and stop counting with, what number they count by, and whether they are counting forward or backward.
- Recognize the place value pattern that changes as they count.
- Students need to observe visual patterns of counting forward and backward by 10's and 100's.
- Skip counting is foundational for students to begin the development of multiplication.

Children's Literature:

- *Place Value* by Danielle Carroll
- *What's the Place Value?* By Shirley Smith Duke
- *Two Ways to Count to Ten* by Ruby Dee
- *My Even Day* by Doris Fisher and Dani Sneed
- *One Odd Day* by Doris Fisher and Dani Sneed
- *Leaping Lizards* by Stuart J. Murphy
- *Earth Day* by Stuart J. Murphy

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal checks of learning to elicit evidence regarding the degree to which a particular student or class of students has mastered the aligned learning goals. Based on the evidence collected, teachers adjust their ongoing instructional activities.

The following are suggestions teachers may consider as they plan the formative checkpoint they will use for this big idea of instruction.

Resources:

- Chapter 1 Mid-Chapter Checkpoint
- Chapter 1 Performance Task
- Chapter 2 Mid-Chapter Checkpoint
- Chapter 2 Performance Task
- Math Facts (One-on-One Fluency)
- Math Journal Entries

MFAS Tasks 2.NBT.1.1:

- Modeling Numbers with Base Ten Blocks
- How Many Hundreds, Tens, and Ones?
- Can You Write the Number?
- Showing One Hundred Equals Ten Tens

MFAS Tasks 2.NBT.1.3:

- Writing the Expanded Form of a Number
- Writing Numerals From Expanded Form MFAS: Reading Numerals to 1,000
- Writing Numerals From Number Names

MFAS Tasks 2.NBT.2.8:

- Subtract 10 Mentally
- Mentally Subtract 100
- Mentally Add 10 More
- Add 100 Mentally

MFAS Tasks 2.OA.3.3:

- Showing a Collection as Odd or Even
- How Do You Know if a Number is Even or Odd?
- Is It Even or Odd?
- Even Numbers as the Sum of Two Equal Addends

MFAS Tasks 2.NBT.1.2:

- Counting Backward
- Counting by Fives Within 1,000
- Counting by Tens and Hundreds Within 1,000
- Counting by Ones Within 1,000

MFAS Tasks 2.NBT.1.4:

- Using Digits
- Who Has More?
- Inequalities Using Symbols
- Missing Digits

Sample: Suggested Standards-based Checks – Blueprint

- Place Value; Scoring Rubric
- Comparing Three-Digit Numbers; Scoring Rubric

Big Idea 2
Quarters 1 & 2

Academic Plan
Mathematics – Grade Two (Course #5012040)

Suggested Big Idea Length:
16 – 20 days

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Basic Facts Addition and Subtraction*

Quarter one of second grade focuses on developing students' understanding basic addition and subtraction facts and relationships. Students should be able to: use addition and subtraction to solve multi-step word problems, identify key words to solve those problems, fluently add and subtract within 20 using a variety of strategies, know from memory all sums of two one-digit numbers (by the end of second grade), use addition to find the total number of objects in an array (up to five rows and five columns), write an equation to express the total sum of equal addends. Students will fluently add and subtract within 100 using strategies based on place value and properties of operations. Students will add up to four two-digit numbers using strategies based on place value and represent whole number sums and differences within one hundred on a number line diagram.

Manipulatives: Below are some of the manipulatives that should be included in the instruction of Big Idea 2. View the attached document, Grade 2 Big Idea 2 Manipulatives, for a comprehensive list of manipulatives and their suggested usage during Big Idea 2.

- Bar Models
- Connecting Cubes
- Egg Carton
- Number Line
- Two-Color Counters

Standards

Math Content Standards	Cross Content Standards
MAFS.2.OA.1.1: 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. **MAFS.2.OA.2.2:** Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers. **MAFS.2.OA.3.4:** 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. **MAFS.2.NBT.2.5:** Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	**LAFS.2.SL.1.1:** Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). b. Build on others' talk in conversations by linking their comments to the remarks of others. c. Ask for clarification and further explanation as needed about the topics and texts under discussion. **LAFS.2.SL.1.3:** Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.

MAFS.2.MD.2.6:
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.

Suggested Standards for Mathematical Practice

MAFS.K12.MP.2.1:
Reason abstractly and quantitatively.
- What strategy did you use? Why?
- What is a situation that could be represented by this equation?
- How did you figure out how many objects are in the array?

MAFS.K12.MP.6.1:
Attend to precision.
- How can you use math vocabulary in your explanation?
- How do you know your answer is reasonable?

MAFS.K12.MP.7.1:
Look for and make use of structure.
- Is the total number of objects the same if we skip count by rows as if we skip count by columns?

Big Idea(s)

Basic Facts Addition and Subtraction

Essential Outcome Question(s)

How can you use patterns and strategies to find sums and differences for basic facts?

Conceptual Understandings	Essential Question(s)
• Mental math strategies may be used to solve math problems. • When we understand and practice multiple strategies for adding and subtracting numbers, we develop fluency. • Addition and subtraction have an inverse relationship and we can use our understanding of this relationship to help us develop fluent problem solving.	• What are some strategies for remembering addition and subtraction facts? • Why is it important to understand the relationship between addition and subtraction?

	Aligned Learning Goals	District Adopted Materials	Supplemental Resources	Strategies for Differentiation
Basic Facts Strategies 12 content days	Use double facts and near doubles to find sums *(OA.2.2)* Make a ten to add *(OA.2.2)*	Go Math! Chapter 3 MAFS Teaching Support Lesson 3.6A	• Illuminations: Some Special Sums • CPALMS: Piece of Cake Mental Math!	Reteach & Enrichment Support: Strategies for Addition and Subtraction

	Use a number line to find differences *(OA.2.2, MD.2.6)*	Achieve the Core Go Math Guidance Documents		The above document provides opportunities for reteach and enrichment with the current aligned learning goal.
	Use bar diagrams to model addition and subtraction *(OA.1.1)*			
	Identify key words to solve addition and subtraction word problems involving one and two-step problems *(OA.1.1)*			
	Use skip counting/repeated addition to find the number of items in an array *(OA.3.4)*			
Relationships Between Addition & Subtraction 5 content +1 progress	Use Commutative and Associative Properties to find sums of two-digit addends *(OA.2.2, NBT.2.5)*	Go Math! Chapter 3 Achieve the Core Go Math Guidance Documents	• Task Card: Math-E-Magic • CPALMS: Show It Another Way	Reteach & Enrichment Support: Relationships Between Addition and Subtraction The above document provides opportunities for reteach and enrichment with the current aligned learning goal.
	Use the inverse relationship of addition and subtraction *(OA.2.2)*			

Instructional Strategies and Resources

Fluency is based on instructional strategies that are developed conceptually, rather than rote practice and memorization.
Thinking strategies for addition facts include:

- facts that have 0 as an addend
- doubles facts
- facts that have addends of 1 or 2
- making ten

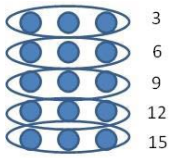
Thinking strategies for subtraction facts include:

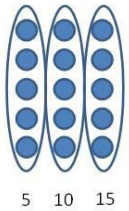
- relationships within addition and subtraction
- part/part/whole
- inverse operations

One way to support fluency and understanding is to ask students to respond to addition and subtraction problems often and explain/justify their answers to promote deeper understanding; beyond memorization. Fluency is based on conceptual instructional strategies which require students to reason through addition and subtraction problems, applying a variety of strategies.

Rectangular arrays provide opportunities for students to apply strategies of counting, skip counting, and addition and subtraction as they transition toward multiplication. Generally, students may:

- Count the total by going up and down, rows and columns.
- Skip-count by the number in each row or the number in each column, and discuss that the results are the same as when counting individual objects in the array.





The focus during this instructional time is on addition, not multiplication. Second grade students are not expected to use multiplication to represent equal groups of objects, only addition. Teachers should connect this Big Idea to students' earlier study of even and odd numbers. If we arrange an even number of objects in rows and columns, how is that different from when we try to do the same for an odd number of objects? This would be a powerful mathematical investigation that would help students connect even and odd patterns to skip counting and later multiplication ideas.

Children's Literature:

- *12 Ways to Get to 11* by Eve Merriam
- *A Fair Bear Share* by Stuart J. Murphy
- *Let's Go Visiting* by Sue Williams

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal checks of learning to elicit evidence regarding the degree to which a particular student or class of students has mastered the aligned learning goals. Based on the evidence collected, teachers adjust their ongoing instructional activities.

The following are suggestions teachers may consider as they plan the formative checkpoint they will use for this big idea of instruction.

Resources:

- Chapter 3 Mid-Chapter Checkpoint
- Chapter 3 Performance Task
- Math Facts (One-on-One Fluency)
- Math Journal Entries

MFAS Tasks 2.OA.1.1:

- Compare (Smaller Unknown) Word Problems
- Word Problems with Result Unknown
- Both Addends Unknown
- Solving a Two-Step Word Problem: Eating Grapes
- Solving a Two-Step Word Problem: Going Fishing

MFAS Tasks 2.OA.2.2:

- Fluency for Subtraction Within 20
- Fluency for Addition Within 20
- Fluency with Basic Addition Facts
- Addition Facts from Memory

MFAS Tasks 2.OA.3.4:

- Counting by Rows or Columns
- All Your Penguins in a Row
- Counting an Array

Sample: Suggested Standards-based Check – Blueprint

- Basic Facts Addition and Subtraction; Scoring Rubric

Big Idea 3
Quarter 2

Academic Plan
Mathematics – Grade Two (Course #5012040)

Suggested Big Idea Length:
30 – 34 days

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Two-Digit Addition and Subtraction*

In order to understand addition and subtraction fluently, students must understand when to use each operation, how to write number sentences to match specific problem situations, and how to compute sums and differences. These three understandings are represented by the standards in this Big Idea.

Standard OA.1.1 is specific to students' development of the understanding of when to use addition and subtraction (which situations) and how to represent these situations with number sentences.

Standard NBT.2.5 is focused on developing students' ability to understand how to compute sums and differences in meaningful ways using strategies based on deep understandings of place value and the properties of operations.

In Big Idea 3, students apply their fluency with addition and subtraction of single-digit sums to solve addition and subtraction problems with 2-digit numbers in situations of adding to, taking from, putting together, taking apart and comparing. Students apply strategies such as composing and decomposing numbers, compensation, and the inverse relationship between addition and subtraction. Students use their understanding of place value, mental math, and properties of operations to solve problems and justify the reasonableness of their solutions.

Manipulatives: Below are some of the manipulatives that should be included in the instruction of Big Idea 3. View the attached document, Grade 2 Big Idea 3 Manipulatives, for a comprehensive list of manipulatives and their suggested usage during Big Idea 3.

- Bar Diagram
- Base-Ten Blocks
- Connecting Cubes
- Number Line
- Place Value Chart

Teacher Note:

Standard **MAFS.2.NBT.2.7** will be partially instructed during Big Idea 3 and completed during Big Idea 4. Teachers should use concrete models and drawings; giving students multiple strategies for solving problems.

Standards

Math Content Standards

MAFS.2.OA.1.1:
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.

MAFS.2.OA.1.a:
Determine the unknown whole number in an equation relating four or more whole numbers. For example, determine the unknown number that makes the equation true in the equations 37 + 10 + 10 = _____ + 18, ? – 6 = 13 – 4, and 15 – 9 = 6 + ☐.

MAFS.2.NBT.2.5:
Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

MAFS.2.NBT.2.6:
Add up to four two-digit numbers using strategies based on place value and properties of operations.

MAFS.2.NBT.2.7:
Add and subtract within 1,000, 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.

MAFS.2.NBT.2.9:
Explain why addition and subtraction strategies work, using place value and the properties of operations.

Cross Content Standards

LAFS.2.SL.1.1:
Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.

a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
b. Build on others' talk in conversations by linking their comments to the remarks of others.
c. Ask for clarification and further explanation as needed about the topics and texts under discussion.

Suggested Standards for Mathematical Practice

MAFS.K12.MP.2.1:
Reason abstractly and quantitatively.

- How do you know your sum makes sense?
- What operation did you use to represent the addition problem?
- Why does that operation represent the addition problem?
- What is a situation that could be represented by this subtraction problem?
- How do you know the difference makes sense?

MAFS.K12.MP.3.1:
Construct viable arguments and critique the reasoning of other.

- What do you think will happen if you change one of the addends?
- How do you know that is the correct sum?
- Why do you agree or disagree with the sum for the addition problem?

MAFS.K12.MP.5.1:
Use appropriate tools strategically.

- What could you use to help you solve the subtraction problem?
- What subtraction strategy could you use to make the calculation easier?

MAFS.K12.MP.6.1:
Attend to precision.

- How do you know the sum is reasonable?
- What does the sum for the problem mean?
- How do you the difference is reasonable?
- What does the difference mean?

Big Idea(s)

Two-Digit Addition and Subtraction

Essential Outcome Question(s)

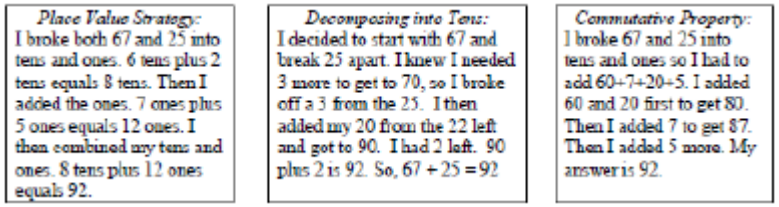
- How do you use place value to add and subtract two-digit numbers with and without regrouping?
- What are some different ways to add and subtract two-digit numbers?

Conceptual Understandings	Essential Question(s)
• A deep understanding of the meaning of addition and subtraction is essential to interpreting math word problems and determining the operation needed to solve them. • We use our understanding of place value and properties of operations to solve addition and subtraction problems. • It is important to be able to build and use concrete models and drawings to represent two-digit addition and subtraction. • We apply our ability to represent numbers in multiple ways to help us solve addition and subtraction problems.	• How do you make an addend a ten to solve and addition problem? • How do you record the steps when adding and subtracting two-digit numbers? • What are some ways to add three or four numbers? • How can you break apart numbers to solve a subtraction problem? • What are some different ways to model show and solve subtraction problems?

Aligned Learning Goals		District Adopted Materials	Supplemental Resources	Strategies for Differentiation
Addition of 2-Digit Numbers 13 content + 1 progress monitoring check	Break apart addends into tens and ones to add *(NBT.2.6)*	Go Math! Chapter 4 Achieve the Core Go Math Guidance Documents MAFS Teaching Support Lesson 4.11A	• K – 5 Math Resource: Number Wheel Spin 2 Digit Addition Split	Reteach & Enrichment Support: Addition of 2-Digit Numbers The above document provides opportunities for reteach and enrichment with the current aligned learning goal.
	Add within 100 using concrete models and drawings *(NBT.2.6, NBT.2.7)*			
	Add within 100 using strategies of place value and properties of operations *(NBT.2.5)*			
	Add up to four two-digit numbers using strategies of place value and properties of operations *(NBT.2.6)*			
	Explain how to add two-digit numbers with and without regrouping *(NBT.2.9)*			
	Solve one- and two-step word problems involving addition within 100 *(OA.1.1)*			
	Determine unknowns in an equations relating four or more numbers *(OA.1.a)*			
	Determine unknowns to make an equation true *(OA.1.a)*			

Instructional Strategies and Resources

Students use their understanding of addition to develop fluency with addition within 100. They solve problems by applying their understanding of models for addition and they develop, discuss, and use efficient, accurate, and generalizable methods to compute sums of two-digit whole numbers in base-ten notation, using their understanding of place value and the properties of operations. They select and accurately apply methods that are appropriate for the context and the numbers involved to mentally calculate sums and differences for numbers with only tens or only hundreds. Some strategies students should explore in this topic include place value strategies, strategies which require decomposition into tens, and application of the Commutative Property of Addition.
Here are examples of each strategy as applied to the addition problem 67+25=



Composing and decomposing numbers involves combining and separating them to make parts and wholes. In our place value system, students must learn that when we accumulate 10 units, we regroup them into a larger unit. Students began to develop this understanding in kindergarten and first grade. They will now apply this knowledge as a strategy to help them add and subtract. Students learn in this topic that when we are using mental math to add numbers, understanding how numbers can be composed and decomposed helps us.

- For example, if we need to add 46 + 30, it is helpful to recognize we are simply adding 3 tens to 46. In the example above, both addends were decomposed so that they could be easily recombined.

In this Big Idea, students also learn to apply the properties of operations to add. All algorithms or procedures for adding multi-digit numbers are based on the properties of addition. This is why students focus so heavily on learning how to use these properties to add in the early grades. When they learn to apply algorithms to add later, these procedures will make sense rather than just being a set of steps we must memorize.

Children who demonstrate *t*hat they can manipulate two addends to transform one or both of them into more manageable numbers (e.g., 48+53 is transformed into 50+51) are showing that they can reason abstractly and quantitatively. The ability to work with numbers flexibly is a valuable computation and problem solving skill. Children use several processes in the beginning stages of building understanding of addition. Help the students understand that strategies used for 1-digit addition are not efficient for 2-digit addition. Children may also invent their own strategies. This is encouraged and serves as valuable opportunities for classroom discussions.

In this topic students will also learn to add up to 4 two-digit numbers by applying place value and property of operations strategies. All of students' experiences in adding larger numbers should require them to explain why addition and subtraction strategies work, both verbally and in writing, by relating their strategies to place value and the properties of operations.

- For example, students explain their answer to 37 + 15 using place value as follows: "I broke 37 and 15 into 3 and 1 tens, and 7 and 5 ones. Adding these, I got 4 tens and 12 ones. I then composed the 12 ones into 1 ten and 2 ones, added 4 tens and 1 ten to get 5 tens. I got a final answer of 5 tens and 2 ones or 52." Another student may explain his/her answer using the commutative property as follows: "I broke 37 and 15 into 37 + 15 = 30 + 7 + 10 + 5. I switched the 7 and the 10 to add the 30 and 10 first to get 30 + 10 + 7 + 5 = 40 + 12 = 52.

Children's Literature:

- *Betcha* by Stuart J. Murphy
- *Animals on Board* by Stuart J. Murphy
- *Spaghetti and Meatballs for All* by Marilyn Burns
- *The Mission of Addition* by Brian P. Cleary

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal checks of learning to elicit evidence regarding the degree to which a particular student or class of students has mastered the aligned learning goals. Based on the evidence collected, teachers adjust their ongoing instructional activities.

The following are suggestions teachers may consider as they plan the formative checkpoint they will use for this big idea of instruction.

Resources:

- Chapter 4 Mid-Chapter Checkpoint
- Chapter 4 Performance Task
- Math Facts (One-on-One Fluency)
- Math Journal Entries

MFAS Task 2.NBT.2.5:

- Adding Within 100 Using Place Value

MFAS Task 2.OA.1.a:

- Determine the Missing Addend

MFAS Tasks 2.NBT.2.6:

- Adding Two- Digit Numbers Using Place Value
- Adding Two- Digit Numbers Using Properties of Operations
- Adding Four Two- Digit Numbers
- Andy's Book

MFAS Tasks 2.NBT.2.9:

- Using Place Value
- Explaining the Standard Algorithm for Addition

Subtraction of 2-Digit Numbers 17 content + 1 progress monitoring check	Break apart numbers into tens and ones to subtract *(NBT.2.5)* Subtract within 100 using concrete models and drawings *(NBT.2.6, NBT.2.7)* Subtract within 100 using strategies of place value and properties of operations *(NBT.2.5)* Explain how to subtract two-digit numbers with and without regrouping *(NBT.2.9)* Relate addition to subtraction to find differences *(NBT.2.5)* Solve problems using drawings and equations with a symbol for the unknown number *(OA.1.1)* Solve one and two step word problems involving subtraction within 100 *(OA.1.1)*	Go Math! Chapter 5 Achieve the Core Go Math Guidance Documents	• CPALMS: What is your new number when you add or subtract? • CPALMS: Subtracting "The Fast Way" With the Hundred Grid • CPALMS: Words and Subtraction • CPALMS: Amazing Animal Athletes • CPALMS: Ten-Hut Part-2	Reteach & Enrichment Support: Subtraction of 2-Digit Numbers The above document provides opportunities for reteach and enrichment with the current aligned learning goal.

Instructional Strategies and Resources

The focus shifts to subtraction and to applying both addition and subtraction to solve two-step problems. Students use their understanding of addition and subtraction to develop fluency with subtraction within 100. They solve problems by applying their understanding of models for addition and subtraction and they develop, discuss, and use efficient, accurate, and generalizable methods to compute sums and differences of two-digit whole numbers in base-ten notation, using their understanding of place value and the properties of operations. They select and accurately apply methods that are appropriate for the context and the numbers involved to mentally calculate sums and differences for numbers with only tens or only hundreds. Students are taught to use multiple strategies for subtraction. By the end of third grade, students' deep understanding of these strategies leads to their ability to use a range of algorithms (including the standard algorithm) to add and subtract multi-digit numbers. Some strategies students should explore in this topic include strategies which require decomposition into ten and strategies that require students to use what they know about the inverse relationship between addition and subtraction to subtract.

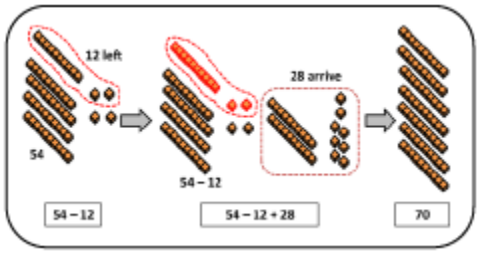
Here are examples of each strategy as applied to the subtraction problem 63-32=

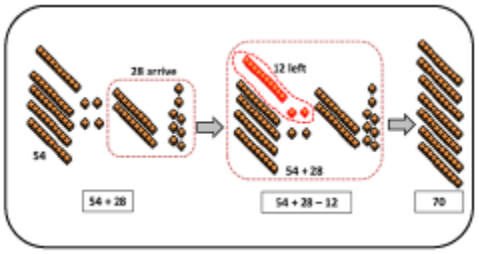
Decomposing into Tens:	*Think Addition:*
I broke apart both 63 and 32 into tens and ones. I know that 3 minus 2 is 1, so I have 1 left in the ones place. I know that 6 tens minus 3 tens is 3 tens, so I have a 3 in my tens place. My answer has a 1 in the ones place and 3 in the tens place, so my answer is 31. 63 – 32 = 31	I thought, '32 and what makes 63?'. I know that I needed 30, since 30 and 30 is 60. So, that got me to 62. I needed one more to get to 63. So, 30 and 1 is 31. 32 + 31 = 63

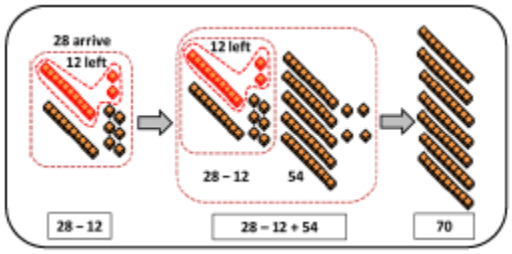
Subtraction can be effectively addressed through modeling. Students may use tools such as base-ten blocks or write equations to represent a problem situation involving subtraction. Students need multiple opportunities to apply their knowledge. This will provide them with opportunities to make meaning of mathematics. It may be helpful for the students to act out, draw a picture, and/or write an equation to solve a problem. It will also be helpful for students to relate addition and subtraction, help them to find the related facts.

Students solve more complex word problems (including one and two-step problems) with sums up to 100 involving addition and subtraction using a variety of models. An example of a two-step word problem might be: "There are 54 fans at a Little League baseball game. After the 2nd inning, 12 fans left the game. After the 3rd inning, 28 new fans arrived. How many fans were at the baseball game after the 3rd inning?"

Students also continue to explain their strategies verbally, by writing words, by using base-ten models, and by writing equations. For example, students explain why 12 is subtracted from, and then 28 is added to, 54 based on the ideas of joining and separating. Using base-ten models to illustrate their strategies, students also justify why 54 and 28 can be added before 12 is subtracted or that 12 can be subtracted from 28 first and the result is added to 54.







Children's Literature:

- *The Action of Subtraction* by Brian P. Cleary
- *Subtraction Action* by Loreen Leedy
- *Elevator Magic* by Stuart J. Murphy

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal checks of learning to elicit evidence regarding the degree to which a particular student or class of students has mastered the aligned learning goals. Based on the evidence collected, teachers adjust their ongoing instructional activities.

The following are suggestions teachers may consider as they plan the formative checkpoint they will use for this big idea of instruction.

Resources:

- Chapter 5 Mid-Chapter Checkpoint
- Chapter 5 Performance Task
- Math Facts (One-on-One Fluency)
- Math Journal Entries

MFAS Tasks 2.NBT.2.5:

- Crossing a Decade
- Using Properties and Place Value to Add and Subtract
- Fluently Subtract Within 100

MFAS Tasks 2.OA.1.1:

- Compare (Bigger Unknown) Word Problems
- Solving a Two-Step Word Problem: Marbles in a Bag
- One, Two, Three Problems to Solve
- Add To and Take From (Start Unknown)

MFAS Tasks 2.NBT.2.9:

- Counting Up to Subtract
- Explaining the Standard Algorithm for Subtraction

Sample: Suggested Standards-based Checks – Blueprint

- Two-Digit Addition; Scoring Rubric
- Two-Digit Subtraction; Scoring Rubric

Big Idea 4
Quarters 2 & 3

Academic Plan
Mathematics – GradeTwo (Course #5012040)

Suggested Big Idea Length:
20 – 24 days

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Three-Digit Addition and Subtraction*
Quarter two of second grade focuses on developing students' understanding three digit addition and subtraction problems. Students will be able to: break apart three digit addends, add and subtract within 1,000 using models and drawings, add and subtract within 1,000 using a variety of place value strategies, and adding and subtracting within 1,000 using regrouping.

Manipulatives: Below are some of the manipulatives that should be included in the instruction of Big Idea 4. View the attached document, Grade 2 Big Idea 4 Manipulatives, for a comprehensive list of manipulatives and their suggested usage during Big Idea 4.

- Base-Ten Blocks

Standards

Math Content Standards	Cross Content Standards
MAFS.2.NBT.2.7: 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.	**LAFS.2.SL.1.1:** Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). b. Build on others' talk in conversations by linking their comments to the remarks of others. c. Ask for clarification and further explanation as needed about the topics and texts under discussion. **LAFS.2.SL.1.2:** Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. **LAFS.2.SL.1.3:** Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.

	Suggested Standards for Mathematical Practice
	MAFS.K12.MP.5.1: Use appropriate tools strategically. • How can you use base-ten blocks to represent 145+207? • How can you represent the first step in an addition problem using a quick picture? **MAFS.K12.MP.8.1:** Look for and express regularity in repeated reasoning. • When do you regroup ones in subtraction? Tens? Hundreds? • What do you need to know when subtracting the ones? Tens? Hundreds?

Big Idea(s)
Three-Digit Addition and Subtraction
Essential Outcome Question(s)
What are some strategies for adding and subtracting three-digit numbers?

Conceptual Understandings	**Essential Question(s)**
• Use knowledge of adding and subtracting two-digit numbers to build an understanding of three-digit addition and subtraction. • Understand regrouping in subtraction. • Develop strategies for addition and subtraction of three-digit numbers. • Build and use concrete models and drawings to represent three-digit addition and subtraction.	• What are the steps when finding the sum in a three digit addition problem? • What are the steps when finding the difference in three digit addition subtraction problems? • When do you need to regroup?

Aligned Learning Goals		**District Adopted Materials**	**Supplemental Resources**	**Strategies for Differentiation**
Adding Three-Digit Numbers 10 content days	Break apart 3 digit addends *(NBT.2.7)* Add within 1,000 using models and drawings *(NBT.2.7)* Add within 1,000 using place value strategies (properties of operation and/or relationship) *(NBT.2.7)*	Go Math! Chapter 6 Achieve the Core Go Math Guidance Documents	• CPALMS: Roll and Add Three-Digit Numbers	Reteach & Enrichment Support: Addition of Three-Digit Numbers The above document provides opportunities for reteach and enrichment with the current aligned learning goal.

	Add within 1,000 using regrouping *(NBT.2.7)*			

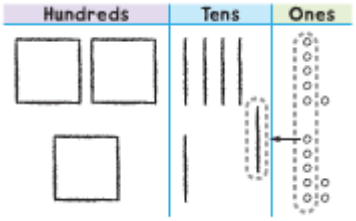
Instructional Strategies and Resources

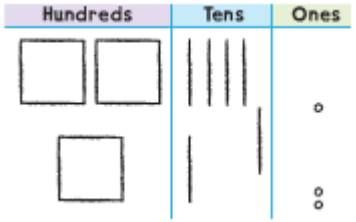
The focus of this Big Idea shifts from adding 2-digit numbers to adding 3-digit numbers. It is important to provide instruction on adding the expanded forms of three-digit numbers. For example, 684 + 178 = (600 + 80 + 4) + (100 + 70 + 8) = (600 + 100) + (80 + 70) + (4 + 8) = 700 + 150 + 12 = 862.

Children may 'invent' their own strategies to add numbers; however, these strategies may be inefficient and lengthy. In this Big Idea children will be exposed to the standard algorithm for addition. Encourage the student to solve three-digit addition problems in different ways to encourage flexibility in the use of strategies. Ask students which strategy is most efficient for them. Allow the student to explain and justify his or her strategy. Provide feedback to the student on how the explanation/justification could be more clear and complete.

Use base ten blocks and quick pictures to show the student how to compose a new ten and, eventually a new hundred in the context of addition problems. Manipulatives, quick pictures and other tools will help to build a foundation for using the standard algorithm.

246 + 117 is represented by the quick picture sequence below.





Combine 6 ones and 7 ones
regroup 13 ones as 1 ten and 3 ones

Add the tens
Add the hundreds

Using place value charts or vertical lines will assist children in managing the digits in each column by providing separation for the hundreds, tens and ones and will Ask students "Are there enough ones to regroup as 1 ten? Are there enough tens to regroup as 1 hundred?"

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The following are suggestions teachers may consider as they plan the formative checkpoint they will use for this big idea of instruction.

Resources:

- Chapter 6 Mid-Chapter Checkpoint
- Math Journals

MFAS Task 2.NBT.2.7:

- *Adding Within 1,000*

Subtracting Three-Digit Numbers 11 content + 1 progress monitoring check	Subtract within 1,000 using models and drawings *(NBT.2.7)* Subtract within 1,000 using place value strategies (properties and/or relationships) *(NBT.2.7)* Subtract within 1,000 using regrouping *(NBT.2.7)*	Go Math! Chapter 6 Achieve the Core Go Math Guidance Documents	• CPALMS: How Many Days Until Summer Vacation? • Math Playground Video- How Do You Subtract by Regrouping?	Reteach & Enrichment Support: Subtraction of Three-Digit Numbers The above document provides opportunities for reteach and enrichment with the current aligned learning goal.

Instructional Strategies and Resources

The focus during this instructional time is on subtraction of 3- digit numbers. When teaching three-digit subtraction, it is important to NOT just teach a series of steps, but to emphasize the concept of regrouping tens and hundreds. A common misconception in subtraction is that students find the difference between two numbers, regardless of their position in the problem.

Use caution when explaining to children the reason for regrouping. Instead of saying "You cannot subtract a big number from a small number," say; "There are not enough ones to subtract, so I need to regroup." Or "There are not enough tens to subtract, so I need to regroup."
Children must recognize that 10 is the point at which they need to regroup. It is important to explain to children that you need to regroup 1 ten as 10 ones if the number of ones to be subtracted is greater than the number of ones you are subtracting from. It is important for children to see the relationship between the models, quick pictures and algorithm. If a child makes an error with regrouping, or subtracting incorrectly, they have not yet made the conceptual connection needed to perform the standard algorithm.

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal checks of learning to elicit evidence regarding the degree to which a particular student or class of students has mastered the aligned learning goals. Based on the evidence collected, teachers adjust their ongoing instructional activities.

The following are suggestions teachers may consider as they plan the formative checkpoint they will use for this big idea of instruction.

Resources:
- Math Journals
- Chapter 6 Performance Tasks

MFAS Tasks 2.NBT.2.7:
- Mr. Ford's Money
- Place Value Strategies for Addition and Subtraction
- Subtracting within 1,000

Sample: Suggested Standards-based Check – Blueprint
- Three-Digit Addition and Subtraction; Scoring Rubric

Big Idea 5
Quarter 3

Academic Plan
Mathematics – Grade Two (Course #5012040)

Suggested Big Idea Length:
13 – 17 days

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Money*

Quarter three of second grade focuses on developing students' understanding Money. Students should be able to: identify coins, find the total value of a collection of coins, show a variety of ways to make a dollar, solve word problems using coins and one dollar bills, and use cent and dollar signs appropriately.

Manipulatives: Below are some of the manipulatives that should be included in the instruction of Big Idea 5. View the attached document, Grade 2 Big Idea 5 Manipulatives, for a comprehensive list of manipulatives and their suggested usage during Big Idea 5.

- Coins and Bills
- Hundred Chart
- Number Line

Teacher Note:

Money is now its own Big Idea. Extra time has been allotted for mastery.

Standards

Math Content Standards

MAFS.2.MD.3.8:

Solve one- and two-step word problems involving dollar bills (singles, fives, tens, twenties, and hundreds) or coins (quarters, dimes, nickels, and pennies) using $ and ¢ symbols appropriately. Word problems may involve addition, subtraction, and equal groups situations[1]. *Example: The cash register shows that the total for your purchase is 59¢. You gave the cashier three quarters. How much change should you receive from the cashier?*

a. Identify the value of coins and paper currency.
b. Compute the value of any combination of coins within one dollar.
c. Compute the value of any combinations of dollars (e.g., If you have three ten-dollar bills, one five-dollar bill, and two one-dollar bills, how much money do you have?).
d. Relate the value of pennies, nickels, dimes, and quarters to other coins and to the dollar (e.g., There are five nickels in one quarter. There are two nickels in one dime. There are two and a half dimes in one quarter. There are twenty nickels in one dollar).

Cross Content Standards

LAFS.2.SL.1.1:

Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.

a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
b. Build on others' talk in conversations by linking their comments to the remarks of others.
c. Ask for clarification and further explanation as needed about the topics and texts under discussion.

LAFS.2.SL.1.3:

Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.

Suggested Standards for Mathematical Practice

MAFS.K12.MP.1.1

Make sense of problems and persevere in solving them.

- Which of your coins has the greatest value?
- How did you choose which coins to use?

	MAFS.K12.MP.8.1: Look for and express regularity in repeated reasoning. • How are the coins alike? • What are different ways you can make a dollar?

Big Idea(s)
Money
Essential Outcome Question(s)
How do you use the value of coins and bills to find the total value of a group of money?

Conceptual Understandings	**Essential Question(s)**
• Identify coins and their values. • Understand that money values can be shown in more than one way.	• What are the names and values of different coins? • How can you find the total value of a group of coins?

	Aligned Learning Goals	**District Adopted Materials**	**Supplemental Resources**	**Strategies for Differentiation**
Identifying ,Counting, and Writing Money 14 content + 1 progress monitoring check	Identify coins *(MD.3.8)* Find the total value of a collection of coins *(MD.3.8)* Identify and show a variety of ways to make one dollar *(MD.3.8)* Solve word problems using dollar bills, quarters, dimes, nickels, and pennies *(MD.3.8)* Use the cents and dollar sign appropriately *(MD.3.8)*	Go Math! Chapter 7 Achieve the Core Go Math Guidance Documents MAFS Teaching Support Lessons 7.3A, 7.5A, 7.7A	• CPALMS: Problem Solving – Saving Money 2 • CPALMS: Problem Solving- Jamir's Penny Jar	Reteach & Enrichment Support: Money The above document provides opportunities for reteach and enrichment with the current aligned learning goal.

Instructional Strategies and Resources

In this Big Idea students build on their knowledge of the value of coins.

> For these values to make sense, students must have an understanding of 5, 10, and 25. More than that, they need to be able to think of these quantities without seeing countable objects… A child whose number concepts remain tied to counts of objects [one object is one count] is not going to be able to understand the value of coins. *Van de Walle & Lovin, p. 150, 2006*

Just as students learn that a number (38) can be represented different ways (3 tens and 8 ones; 2 tens and 18 ones) and still remain the same amount (38), students can apply this understanding to money. For example, 25 cents can look like a quarter, two dimes and a nickel, and it can look like 25 pennies, and still all remain 25 cents. This concept of equivalent worth takes time and requires numerous opportunities to create different sets of coins, count sets of coins, and recognize the "purchase power" of coins (a nickel can buy the same things a 5 pennies).

As teachers provide students with sufficient opportunities to explore coin values (25 cents) and actual coins (2 dimes, 1 nickel), teachers will help guide students over time to learn how to mentally give each coin in a set a value, place the random set of coins in order, and use mental math, adding on to find differences, and skip counting to determine the final amount.

Example: **How many different ways can you make 37¢ using pennies, nickels, dimes, and quarters?**
Example: **How many different ways can you make 12 dollars using $1, $5, and $10 bills?**

Repeated practice counting different collections of coins will help build a foundation for solving problems involving dollar bills, quarters, dimes, nickels, and pennies. It is important to provide students with multiple opportunities to explore coin values and actual coins. Guide students over time to learn how to mentally give each coin in a set a value, place the random set of coins in order, and use mental math, adding on to find differences, and skip counting to determine the final amount.

Children's Literature:

- *Benny's Pennies* by Pat Brisson
- *Alexander, Who Used to Be Rich Last Sunday* by Silver Burdett
- *A Quarter from the Tooth Fairy* by Caren Holtzman

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The following are suggestions teachers may consider as they plan the formative checkpoint they will use for this big idea of instruction.

Resources:

- Chapter 7 Mid-Chapter Checkpoint
- Math Journals

MFAS Tasks 2.MD.3.8:

- Fifty Cents is Your Change
- Ninety Nine Cents

Sample: Suggested Standards-based Check – Blueprint

- Money; Scoring Rubric

Big Idea 6
Quarter 3

Academic Plan
Mathematics – Grade Two (Course #5012040)

Suggested Big Idea Length:
8 – 12 days

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Time*

Quarter three of second grade focuses on developing students' understanding of Time. Students should be able to tell and write the time from analog and digital clocks to the nearest hour, half hour and 5 minutes.

Manipulatives: Below are some of the manipulatives that should be included in the instruction of Big Idea 6. View the attached document, Grade 2 Big Idea 6 Manipulatives, for a comprehensive list of manipulatives and their suggested usage during Big Idea 6.

- Connecting Cubes
- Number Line
- Plastic Analog Clock Faces

Teacher Note:

A.M. and P.M. are no longer included in the standard for telling time. However, it is important for students to understand the A.M. and P.M. concepts.

Standards

Math Content Standards	Cross Content Standards
MAFS.2.MD.3.7: Tell and write time from analog and digital clocks to the nearest five minutes.	**LAFS.2.SL.1.1:** Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). b. Build on others' talk in conversations by linking their comments to the remarks of others. c. Ask for clarification and further explanation as needed about the topics and texts under discussion. **LAFS.2.SL.1.3:** Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.
	Suggested Standards for Mathematical Practice
	MAFS.K12.MP.8.1: Look for and express regularity in repeated reasoning. • How can you determine the time? • What are different ways you can show half past seven?

Big Idea(s)
Time

Essential Outcome Question(s)
• How do you read the times shown on analog and digital clocks?

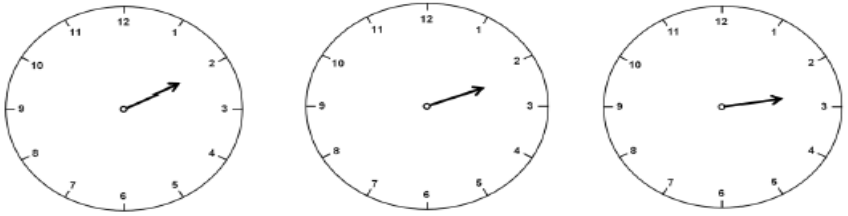
Conceptual Understandings	Essential Question(s)
• Understand how to tell time on an analog and digital clock.	• How can you tell the time on the clock by looking at the clock hands?

Aligned Learning Goals		District Adopted Materials	Supplemental Resources	Strategies for Differentiation
Telling Time 9 content + 1 progress monitoring check	Tell and write time to the hour *(MD.3.7)* Tell and write time to the half hour *(MD.3.7)* Tell and write time from analog and digital clocks to the nearest five minutes, using A.M. and P.M. *(MD.3.7)* Tell and write time to the hour *(MD.3.7)*	Go Math! Chapter 7 Achieve the Core Go Math Guidance Documents	• CPALMS: Stop The Clock • CPALMS: Telling Time to the Nearest 5 Minutes Using Analog and Digital Clocks • CPALMS: Telling Time Using The Hour And Minute Hands	Reteach & Enrichment Support: Time The above document provides opportunities for reteach and enrichment with the current aligned learning goal.

Instructional Strategies and Resources

During this time of instruction students extend their work with telling time to the hour and half-hour as indicated on both analog and digital clocks to the nearest five minutes. It is important to help students make connections between skip counting by 5s and telling time to the nearest five minutes on an analog clock.

Learning to tell time can be challenging for children. They must realize that the hour hand indicates a larger amount of approximate time while the minute hand represents the minutes in each hour. As students experience clocks with only hour hands, they begin to realize that when the time is two o'clock, two-fifteen, or two forty-five, the hour hand looks different- but is still considered "two". Discussing time as "about 2 o'clock", "a little past 2 o'clock", and "almost 3 o'clock" helps build vocabulary to use when introducing time to the nearest 5 minutes.



All of these clocks indicate the hour of "two", although they look slightly different.
This is an important idea for students as they learn to tell time.

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal checks of learning to elicit evidence regarding the degree to which a particular student or class of students has mastered the aligned learning goals. Based on the evidence collected, teachers adjust their ongoing instructional activities.

The following are suggestions teachers may consider as they plan the formative checkpoint they will use for this big idea of instruction.

Resources:

- Math Journals

MFAS Tasks 2.MD.3.7:

- The Clock Says
- Writing Times on Digital Clocks
- Tell Time

Sample: Suggested Standards-based Check – Blueprint

- Time; Scoring Rubric

Big Idea 7
Quarters 3 & 4

Academic Plan
Mathematics – Grade Two (Course #5012040)

Suggested Big Idea Length:
14 – 18 days

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Measuring Length: Customary and Metric*

Quarter three of second grade focuses on developing students' understanding of measurement (customary units and metric units). Students should be able to: measure the length of an object by selecting an using appropriate tools, measure an object twice using different units and relate their measurements, estimate length using units of inches, feet, centimeters, and meters, measure to determine how much longer one object is than another, use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units using drawing and equations with a symbol (for unknown number), represent whole numbers as lengths from 0 on a number line diagram, show the measurements by making a line plot.

Manipulatives: Below are some of the manipulatives that should be included in the instruction of Big Idea 7. View the attached document, Grade 2 Big Idea 7 Manipulatives, for a comprehensive list of manipulatives and their suggested usage during Big Idea 7.

- Base-Ten Blocks
- Grid Paper
- Measuring Tape
- Meter Stick
- Number Line
- Paper Clips
- Ruler
- Square Tiles

Standards

Math Content Standards	Cross Content Standards
MAFS.2.MD.1.1: Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes **MAFS.2.MD.1.2:** Describe the inverse relationship between the size of a unit and number of units needed to measure a given object. *Example: Suppose the perimeter of a room is lined with one-foot rulers. Now, suppose we want to line it with yardsticks instead of rulers. Will we need more or fewer yardsticks than rulers to do the job? Explain your answer.* **MAFS.2.MD.1.3:** Estimate lengths using units of inches, feet, centimeters, and meters. **MAFS.2.MD.1.4:** Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.	**LAFS.2.SL.1.1:** Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). b. Build on others' talk in conversations by linking their comments to the remarks of others. c. Ask for clarification and further explanation as needed about the topics and texts under discussion. **LAFS.2.SL.1.3:** Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.

MAFS.2.MD.2.5:	Suggested Standards for Mathematical Practice
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. **MAFS.2.MD.2.6:** 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. **MAFS.2.MD.4.9:** 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.	**MAFS.K12.MP.4.1:** Model with mathematics. • What number sentence matches the diagram? • What other diagram could you draw for the number sentence? **MAFS.K12.MP.5.1:** Use appropriate tools strategically. • How is a ruler similar to a yardstick? • Which tool would you use to measure the distance around a soccer ball? **MAFS.K12.MP.6.1:** Attend to precision. • Was your measurement close to your estimate? • How do you know your measurement is correct? **MAFS.K12.MP.7.1:** Look for and make use of structure. • What pattern did you see in the measurements?

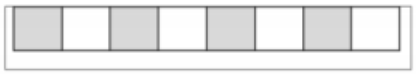
Big Idea(s)
Measuring Length: Customary and Metric
Essential Outcome Question(s)
What are some of the methods and tools that can be used to estimate and measure length in customary and metric units?

Conceptual Understandings	**Essential Question(s)**
• Understand how to measure with a ruler, yard stick, and meter stick. • Identify the correct tool needed to measure different objects. • Use a number line to display measurement data. • Understand that when measuring with different units the size of a unit affects the number of units in a measurement.	• What tools can be used to measure length in inches, feet, centimeters, and meters and how do you use them? • How do inches, feet, centimeters, and meters compare with each other? • How can you estimate the length of an object? If you know the length of an object, how can you estimate the length of another object?

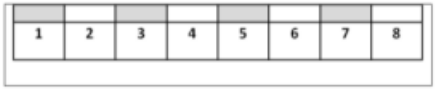
	Aligned Learning Goals	District Adopted Materials	Supplemental Resources	Strategies for Differentiation
Measurement in Customary Units 9 content + 1 progress monitoring check	Measure the length of an object in inches and feet using tools such as rulers, yardsticks, and measuring tapes *(MD.1.1)* Estimate the length of an object in inches and feet *(MD.1.3)* Select appropriate tools to measure the length *(MD.1.1)* Solve addition and subtraction problems involving the length of objects using drawing or equations *(MD.2.5)* Measure the length of objects and use a line plot to display the measurement data *(MD.4.9)* Describe sizes of units and number of units needed to measure an object *(MD.1.2)*	Go Math! Chapter 8 Achieve the Core Go Math Guidance Documents MAFS Teaching Support Lessons 8.7A	• CPALMS: Measurement Centers • CPALMS: Soooooo Tall	Reteach & Enrichment Support: Customary Measurement The above document provides opportunities for reteach and enrichment with the current aligned learning goal.
Measurement in Metric Units 5 content + 1 progress monitoring check	Measure the length of an object in centimeters and meters using tools such as rulers, meter sticks, and measuring tapes. *(MD.1.1)* Estimate the length of an object in cm. and m. *(MD.1.3)* Represent number lengths on a number line *(MD.2.6)* Select the appropriate tools to measure the length of an object *(MD.1.1)* Solve addition and subtraction problems involving the length of objects using drawings or equations *(MD.2.5)* Measure two objects and find the difference *(MD.1.4)*	Go Math! Chapter 9 Achieve the Core Go Math Guidance Documents	• CPALMS: Wilbur's Pig Pen Addition	Reteach & Enrichment Support: Metric Measurement The above document provides opportunities for reteach and enrichment with the current aligned learning goal.

Instructional Strategies and Resources

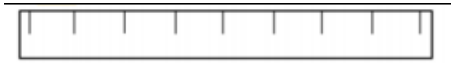
During this time of instruction students will build upon their measurement knowledge by measuring in standard units. Students will measure using both customary and metric units and understand how to choose an appropriate unit of measurement.

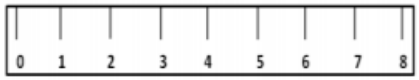


Students progress from a colored square measuring tool…..



…. to a numbered colored square measuring tool….





…. to a ruler marked with inches or centimeters.

Second Grade students will also measure an object using two units of different lengths. This helps students realize that the unit used is as important as the attribute being measured. This is a difficult concept for young children and will require numerous experiences for students to predict, measure, and discuss outcomes. Students will also learn to estimate the lengths of objects using inches, feet, centimeters and meters. Using estimation helps students become more familiar with the unit size.

During this Big Idea students will connect measurement with number and operations. Children will solve problems involving addition and subtraction of lengths. Guide students to draw a diagram representing the action in the problem and then determine the operation needed to solve the problem. Giving students multiple opportunities will reinforce their understanding of adding and subtracting lengths.

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The following are suggestions teachers may consider as they plan the formative checkpoint they will use for this big idea of instruction.

Resources:

- Chapter 8 Mid-Chapter Checkpoint Assessment
- Chapter 9 Mid-Chapter Checkpoint Assessment
- Math Journals

MFAS Tasks 2.MD.1.1:

- Measuring to the Nearest Inch and Centimeter
- Measuring a Curve
- Rulers and Meter Sticks
- Measuring a Segment Longer Than 12 Inches

MFAS Tasks 2.MD.1.2:

- Inches and Centimeters
- Feet and Yards
- Centimeters and Meters
- Feet and Inches

MFAS Tasks 2.MD.1.3:

- Estimating in Inches
- Estimating in Feet
- Estimating in Centimeters
- Estimating in Meters

MFAS Tasks 2.MD.1.4:	*MFAS Tasks 2.MD.2.5:*	*MFAS Tasks 2.MD.2.6:*	*MFAS Tasks 2.MD.4.9:*
• Walking Ants • Comparing Zigzag Segments • How Much Longer? • Dragonflies and Grasshoppers	• Adding Measures • Subtracting Measures • Heading Home • String for Bracelets	• Sums on a Number Line • Representing Numbers with Length • Differences on a Number Line • Representing Nine on a Number Line	• Measuring Hand Spans I • Measuring Hand Spans II • Measuring our Pencils I • Measuring our Pencils II
Sample: Suggested Standards-based Checks – Blueprint • Customary Measurement; Scoring Rubric • Metric Measurement; Scoring Rubric			

Big Idea 8
Quarter 4

Academic Plan
Mathematics – Grade Two (Course #5012040)

Suggested Big Idea Length:
6– 10 days

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Data Collections and Representations*
Quarter four of second grade focuses on developing students' understanding of data collection and representations. Students should be able to: draw a picture and bar graph to represent data sets of up to 4 categories, be able to read a variety of graphs, and be able to read and interpret a tally chart.

Manipulatives: Below are some of the manipulatives that should be included in the instruction of Big Idea 8. View the attached document, Grade 2 Big Idea 8 Manipulatives, for a comprehensive list of manipulatives and their suggested usage during Big Idea 8.

- Connecting Cubes
- Grid Paper 1x1 inch
- Sticky Notes

Standards

Math Content Standards	Cross Content Standards
MAFS.2.MD.4.10: 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 using information presented in a bar graph.	**LAFS.2.SL.1.1:** Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). b. Build on others' talk in conversations by linking their comments to the remarks of others. c. Ask for clarification and further explanation as needed about the topics and texts under discussion.

	Suggested Standards for Mathematical Practice
	MAFS.K12.MP.4.1: Model with mathematics. • Explain how you can use the bar graph to find how many in all. • What number sentence can you write to explain the data? **MAFS.K12.MP.6.1:** Attend to precision. • What does it mean if one bar is longer than another? • What do the labels tell you about the data?

Big Idea(s)

Data Collections and Representations

Essential Outcome Question(s)

How do tally charts, picture graphs, and bar graphs help you solve a problem?

Conceptual Understandings	Essential Question(s)
• Understand that data can be shown in different ways. • Understand the elements of a picture graph and bar graph. • Interpret data in graphs by comparing lengths or heights of bars.	• How are tally marks used to record data for a survey? • How is a picture graph made? • How do you know what the bars on a bar graph stand for?

	Aligned Learning Goals	District Adopted Materials	Supplemental Resources	Strategies for Differentiation
Data Collection and Representations 7 content + 1 progress monitoring check	Analyze, compare data and make a tally chart *(MD.4.10)* Analyze, compare data and make a picture graph *(MD.4.10)* Analyze, compare data and make a bar graph *(MD.4.10)* Using a bar graph, solve simple put together, take apart, and compare problems *(MD.4.10)*	Go Math! Chapter 10 Achieve the Core Go Math Guidance Documents	• CPALMS: How Deep Do They Dive-SeaWorld Classroom Activity • CPALMS: Bugs in the System (Online Bar Graphing Game)	Reteach & Enrichment Support: Data Collections and Representations The above document provides opportunities for reteach and enrichment with the current aligned learning goal.

Instructional Strategies and Resources

During Big Idea 8 students will use both horizontal and vertical bar graphs as well as picture graphs. Students should have multiple opportunities reading and solving problems using graphs and then opportunities to collect data and create graphs. Second Graders will use a single unit scale to represent data on a bar graph and picture graph.

"The emphasis should be to help children see that graphs and charts tell about information, that different types of representations tell different things about the same data. The value of having students actually construct their own graphs is not that they learn the techniques but that they are personally invested in the data and that they learn how a graph conveys information. Once a graph is constructed, the most important activity is discussing what it tells the people who see it, especially those who were not involved in making the graph" Van de Walle, 2006. p. 438.

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The following are suggestions teachers may consider as they plan the formative checkpoint they will use for this big idea of instruction.

Resources:

- Chapter 10 Mid-Chapter Checkpoint
- Math Journals

MFAS Tasks 2.MD.4.10:

- Number of Players
- Features of our Shirts
- Favorite Books
- Shoe Sizes

Sample: Suggested Standards-based Check – Blueprint

- Data; Scoring Rubric

Big Idea 9
Quarter 4

Academic Plan
Mathematics – Grade Two (Course #5012040)

Suggested Big Idea Length:
12 – 16 days

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Geometry and Fractions*

Quarter four of second grade focuses on developing students' knowledge of geometric shapes and fractions. Students should be able to: name and identify attributes of two and three dimensional shapes, be able to identify equal angles and faces, be able to partition shapes into fractions up to fourths, and identify equal fractions.

Manipulatives: Below are some of the manipulatives that should be included in the instruction of Big Idea 9. View the attached document, Grade 2 Big Idea 9 Manipulatives, for a comprehensive list of manipulatives and their suggested usage during Big Idea 9.

- Dot Paper
- Folded Paper
- Fraction tiles
- Paper Plane Shapes
- Pattern Blocks
- Square Tiles
- Three-Dimensional Shapes

Standards

Math Content Standards	Cross Content Standards
MAFS.2.G.1.1: Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. **MAFS.2.G.1.2:** Partition a rectangle into rows and columns of same-size squares and count to find the total number of them. **MAFS.2.G.1.3:** 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, four fourths. Recognize that equal shares of identical wholes need not have the same shape.	**LAFS.2.SL.1.3:** Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue. Suggest Standards for Mathematical Practice **MAFS.K12.MP.1.1:** Make sense of problems and persevere in solving them. • What is another way you can use 16 squares to create a rectangle? • How can you decide how to sort a group of shapes? **MAFS.K12.MP.4.1:** Model with mathematics. • What model shows two equal halves? How do you know? • How are the squares alike, how are they different?

Big Idea(s)

Geometry and Fractions

Essential Question(s)

- How can you describe some two-dimensional and three-dimensional shapes?

- How you can describe equal parts of shapes?

Conceptual Understandings	Essential Outcome Question(s)
• Understand that two- and three-dimensional shapes have attributes that can be identified and used to sort and classify. • Understand that same sized squares can be put together in rows and columns to create a rectangle. • Identify halves, thirds and fourths as equal shares of a figure.	• What are some two-dimensional shapes and three-dimensional shapes? • How you can show equal parts of shapes? • What are the attributes of two and three-dimensional shapes?

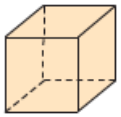
	Aligned Learning Goals	District Adopted Materials	Supplemental Resources	Strategies for Differentiation
Geometry 3-Dimensional Shapes 3 content	Identify three-dimensional shapes *(G.1.1)*	Go Math! Chapter 11 Achieve the Core Go Math Guidance Documents	• Task Card: 3D Footprints • CPALMS: The Greedy Shapes • CPALMS: Let's "Face" it!	Reteach & Enrichment Support: Geometry The above document provides opportunities for reteach and enrichment with the current aligned learning goal.
	Identify and describe three-dimensional shapes according to number of faces, edges, and vertices *(G.1.1)*			
Geometry 2-Dimensional Shapes 4 content	Identify triangles, quadrilaterals, pentagons, and hexagons *(G.1.1)*			
	Draw two-dimensional shapes *(G.1.1)*			
	Identify angles in two-dimensional shapes *(G.1.1)*			
	Sort two dimensional shapes according to their attributes: sides and angles *(G.1.1)*			

Instructional Strategies and Resources

During this time of instruction Second Graders build on their knowledge of two- and three-dimensional shapes. Fluency is developed when children describe attribute of shapes using math vocabulary. Students will be able to recognize and name shapes based on a set of attributes.

i.e. When asked to draw a closed shape with 6 sides, a student will be able to draw a hexagon.

i.e. When asked how many edges a cube has, a student will be able to answer 12 edges.



Give students an opportunity to draw shapes and hold and manipulate solid figures. Students can also explore shapes by combining or partitioning them to make new shapes.

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The following are suggestions teachers may consider as they plan the formative checkpoint they will use for this big idea of instruction.

Resources:

- Chapter 11 Mid-Chapter Checkpoint
- Math Journals

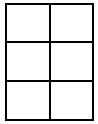
MFAS Tasks 2.G.1.1:

- Figures With Five Sides
- Three Sided Figures
- Which of These are Cubes?
- Four Sided Figures

Fractions 6 content + 1 progress monitoring check	Partition a rectangle into rows and columns of the same-size squares and count to find the total number of them *(G.1.2)* Partition circles and rectangles into two, three, or four equal shares *(G.1.3)* Describe the shares as halves, thirds, and fourths *(G.1.3)* Recognize that equal shares of identical wholes need not have the same shape *(G.1.3)*	Go Math! Chapter 11 Achieve the Core Go Math Guidance Documents	• CPALMS: Describe Fractions of Rectangles • CPALMS: Which Pictures Represent One Half? • K – 5 Math Resource: Cover a Rectangle	Reteach & Enrichment Support: Fractions The above document provides opportunities for reteach and enrichment with the current aligned learning goal.

Instructional Strategies and Resources

Students will partition a rectangle into squares and find the number of squares. This experience helps children build a foundation for finding the area of rectangles in later grades.
i.e. When asked to partition a rectangle into 3 rows and 2 columns, students will create a model as shown below.



There are 6 squares in the rectangle.

Students will also partition circles and rectangles into equal shares of 2, 3, or 4 and identify the equal parts as halves, thirds, or fourths. It is important for students to see non-examples as well as representations that show equal shares.

When partitioning rectangles, it is important for children to see different representations of equal shares. Allow students to explore different ways to divide a rectangle into 4 equal sections. Children must realize that even though the shapes might be different, they are still considered equal shares.

NOTE: It is important for students to understand that fractional parts may not be symmetrical. The only criteria for equivalent fractions is that the area is equal, as illustrated in the first example above.

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The following are suggestions teachers may consider as they plan the formative checkpoint they will use for this big idea of instruction.

Resources:

- Chapter 11 Mid-Chapter Checkpoint
- Math Journals

MFAS Tasks 2.G.1.2:

- Partition the Rectangle into Unit Squares
- Complete the Rectangle
- Construct Rows and Columns
- How Many Units?

MFAS Tasks.2.G.1.3:

- Different Fourths
- Different Halves
- Halves, Thirds, and Fourths
- How Many Fourths are in a Whole?

Sample: Suggested Standards-based Check – Blueprint

- Geometry and Fractions; Scoring Rubric