Curriculum Overview
Mathematics – Grade Four (Course #5012060)

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

Big Idea 1 Place Value, Addition & Subtraction of Whole Numbers	Big Idea 2 Multiplication of Whole Numbers	Big Idea 3 Division of Whole Numbers	Big Idea 4 Factors, Multiples, and Patterns	Big Idea 5 Operations with Fractions	Big Idea 6 Decimals	Big Idea 7 Properties of Geometric Figures	Big Idea 8 Measurement	Big Idea 9 Mastery of Grade 4
Chapter 1	Chapters 2 & 3	Chapter 4	Chapter 5	Chapters 6, 7, & 8	Chapter 9	Chapters 10 & 11	Chapters 12 & 13	Critical Areas
Quarter 1			Quarter 2			Quarter 3		Quarter 4

Big Ideas in red shading denote critical areas for 4th grade. An explanation of the critical areas is provided in the Mathematical Content Standards below.
Big Ideas in blue shading denote supporting areas for 4th grade. These Big Ideas are essential to future critical areas within and across grade levels.

Curriculum Notes:

- Mathematical Content Standards: In Grade 4, instructional time should focus on three critical areas: (1) developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends; (2) developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; (3) understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.
    - (1) Students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place. They apply their understanding of models for multiplication (equal-sized groups, arrays, and area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient, accurate, and generalizable methods to compute products of multi-digit whole numbers. Depending on the numbers and the context, they select and accurately apply appropriate methods to estimate or mentally calculate products. They develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems. Students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends. They select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context.
    - (2) Students develop an understanding of fractions, beginning with unit fractions. Students view fractions in general as being built out of unit fractions, and they use fractions along with visual fraction models to represent parts of a whole. Students understand that the size of a fractional part is relative to the size of the whole. For example, 1/2 of the paint in a small bucket could be less paint than 1/3 of the paint in a larger bucket, but 1/3 of a ribbon is longer than 1/5 of the same ribbon because when the ribbon is divided into 3 equal parts, the parts are longer than when the ribbon is divided into 5 equal parts. Students are able to use fractions to represent numbers equal to, less than, and greater than one. They solve problems that involve comparing fractions by using visual fraction models and strategies based on noticing equal numerators or denominators.

- (3) Students describe, analyze, compare, and classify two-dimensional shapes. Through building, drawing, and analyzing two-dimensional shapes, students deepen their understanding of properties of two-dimensional objects and the use of them to solve problems involving symmetry.

- 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 4 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 Four (Course #5012060)
4th Grade Math CCE Blueprint

Suggested Big Idea Length:
12 – 16 days

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Place Value, Addition, and Subtraction of Whole Numbers*
Students will model, read, and write numbers in all forms (expanded form, standard form and word form) through the millions using manipulatives, foldables, and/or place value blocks to compare and order numbers through the millions. With these numbers the students will also round and regroup to rename them using the base-ten number system. With the students' place value knowledge, the students will add and subtract six digit numbers with and without regrouping.

Manipulatives: Below are some of the manipulatives that should be included in the instruction of Big Idea 1. View the attached document, Grade 4 Big Idea 1 Manipulatives, for a comprehensive list of manipulatives and their suggested usage during Big Idea 1.

- Base-Ten Blocks
- Grid Paper
- Number Line
- Place-Value Chart

Teacher Note:
Additional time has been included during this Big Idea to allow teachers to establish classroom routines and procedures.

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.

Lesson 1.8A should be taught along with Lesson 1.8, to cover the standards MAFS.4.OA.1.a and MAFS.4.OA.1.b. Also, consider using the MFAS tasks related to MAFS.4.OA.1.a: Determining if an Equation is True and MAFS.4.OA.1.b. Comparative Relational Thinking in an Addition Equation, Comparative Relational Thinking in a Subtraction Equation as linked in the Formative Checkpoint section of the Academic Plan during this time of instruction.

Standards

Math Content Standards	Cross Content Standards
MAFS.4.NBT.1.1: Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.* **MAFS.4.NBT.1.2**: Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	**LAFS.4.SL.1.1**: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade *4 topics and texts*, building on others' ideas and expressing their own clearly. a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion. b. Follow agreed-upon rules for discussions and carry out assigned roles.

MAFS.4.NBT.1.3:
Use place value understanding to round multi-digit whole numbers to any place.

MAFS.4.NBT.2.4:
Fluently add and subtract multi-digit whole numbers using the standard algorithm.

MAFS.4.OA.1.a:
Determine whether an equation is true or false by using comparative relational thinking. *For example, without adding 60 and 24, determine whether the equation 60 + 24 = 57 + 27 is true or false.*

MAFS.4.OA.1.b:
Determine the unknown whole number in an equation relating four whole numbers using comparative relational thinking. *For example, solve 76 + 9 = n + 5 for n by arguing that nine is four more than five, so the unknown number must be four greater than 76.*

c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
d. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.

LAFS.4.SL.1.3:
Identify the reasons and evidence a speaker provides to support particular points.

Suggested Standards for Mathematical Practice

MAFS.K12.MP.2.1:
Reason abstractly and quantitatively.
- How is the base-ten number system different from the system used for telling time?

MAFS.K12.MP.4.1:
Model with mathematics.
- How did drawing a picture help you solve this problem?
- What is the relationship between a base-ten block and the next smaller base-ten block?

MAFS.K12.MP.7.1:
Look for and make use of structure.
- What happens when you move one place value to the left?
- Why do ten thousand longs equal 100,000?

Big Idea(s)

Place Value, Addition, and Subtraction of Whole Numbers

Essential Outcome Question(s)

How can you use place value to compare, add, subtract, and estimate with whole numbers?

Conceptual Understandings

- The value of each digit is determined by its position.
- Moving to the left in the base-ten number system, each digit has a place value 10 times the value of the place to the right. Focusing on this pattern in place value will help students build understanding of the base-ten number system.
- Understand the millions, thousands, and ones period to apply comparing, ordering, and rounding numbers.
- Use rounding as the foundation for evaluating the reasonableness of near amounts and estimates.

Essential Question(s)

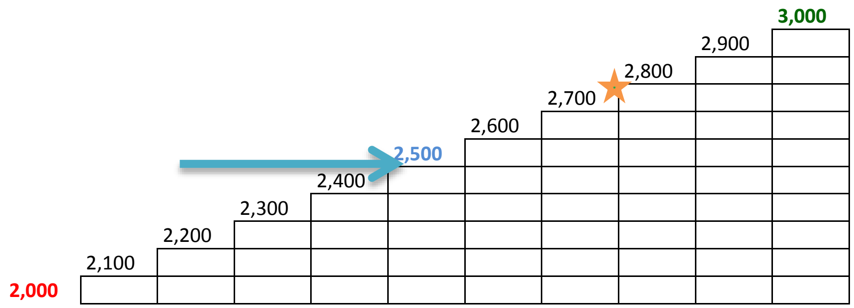
- How do you compare and order whole numbers?
- What are some strategies you can use to round whole numbers?
- How is adding five- and six-digit numbers similar to adding three-digit numbers?
- Why are you allowed to borrow from the place value to the left?

Aligned Learning Goals		District Adopted Materials	Supplemental Resources	Strategies for Differentiation
Order and Compare Numbers within the Millions 7 content	Model, read, and write numbers within the millions *(NBT.1.2)*	Go Math! Chapter 1 Achieve the Core Go Math Guidance Documents	• Task Card: Animal Crackers • Task Card: Vacation Area • Task Card: Esti-Census • Task Card: Explaining 10,000	Reteach & Enrichment Support: Order and Compare Numbers within the Millions The above document provides opportunities for reteach and enrichment with the current aligned learning goal.
	Compare and order numbers within the millions *(NBT 1.2)*			
	Round numbers through the millions *(NBT.1.3)*			
	Regroup numbers to rename them using base ten *(NBT.1.1)*			
Add and Subtract 6-Digit Numbers 6 content + 1 progress	Add whole numbers with up to six-digits *(NBT.2.4)*	Go Math! Chapter 1 MAFS Teacher Support Lesson 1.8A	• Task Card: Add It Up Cafe • Task Card: Road Trip USA • CPALMS: Let's Make a Movie	Reteach & Enrichment Support: Add and Subtract 6-Digit Numbers The above document provides opportunities for reteach and enrichment with the current aligned learning goal.
	Subtract whole numbers with up to six-digits *(NBT.2.4)*			
	Determine if an equation is true without adding or subtracting *(OA.1.a, OA.1.b)*			

Instructional Strategies and Resources

Students' exploration of place value includes extending their understanding that a digit in one place value position is ten times what it is in the place value position to the right.

- Students use place value concepts to understand that a digit has a different value depending on its place value position.
- Representing numbers flexibly is a foundation for when regrouping is required for adding and subtracting multi-digit numbers.
- Break down numbers by place value to compare multi-digit numbers. This can be done using a place value chart or expanded form.
- Comparing the same place values from left to right is essential.
- Using a "Stair Model" will help students visualize rounding numbers. i.e. Round 2,785 (plot on the stair model ★) to the nearest thousand. The bottom stair is the lower thousand value, the top stair is the higher thousand value. The blue arrow indicates the halfway point between 2,000 and 3,000. If the number you have plotted is below the red arrow, then the number is rounded down; if the number you have plotted is above the red arrow, then the number is rounded up.



Students extend their understanding of adding and subtracting numbers up to 999,999 by building a deeper understanding of the standard algorithm.

- Using grid paper or a place value chart will help students keep place value positions organized when adding and subtracting.
- Students must recognize that if the digit being subtracted is greater than the digit it is being subtracted from, they must regroup.
- Having students explain why they need to regroup using base-ten blocks will help to reinforce their understanding of the standard algorithm.

Children's Literature:

- *A Million Dots* by Andrew Clements
- *How Big is a Million?* By Anna Milbourne
- *Sir Cumference and All the King's Tens* by Cindy Neuschwander

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal assessments 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 Diagnostic Interview
- Math Journal Entries

MFAS Tasks 4.NBT.1.1:

- Family Vacations
- Seven Hundred Seventy Seven
- Base Ten Place Value
- Comparing Amounts of Baseball Cards

MFAS Tasks 4.NBT.1.2:

- Numbers in Expanded Form
- Collections
- Writing Number Names to a Million
- Using Word and Expanded Form
- Reading Greater Numbers

MFAS Tasks 4.NBT.1.3:

- Rounding to the Thousands Place
- Rounding to the Ten Thousands Place
- Rounding to the Hundred Thousands Place
- Rounding Numbers

MFAS Tasks 4.NBT.2.4:

- Subtracting Using the Standard Algorithm
- Find the Error
- Addition Using the Standard Algorithm
- Fill in the Missing Number

MFAS Tasks 4.OA.1.a:

- Are the Equations True?
- Determining if an Equation is True

MFAS Tasks 4.OA.1.b:

- Comparative Relational Thinking in an Addition Equation
- Comparative Relational Thinking in a Subtraction Equation

Sample: Suggested Standards-based Check – Blueprint

- Place Value, Addition & Subtraction; Scoring Rubric

Big Idea 2
Quarter 1

Academic Plan
Mathematics – Grade Four (Course #5012060)

Suggested Big Idea Length:
24 – 28 days

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Multiplication of Whole Numbers*
Students will multiply a whole digit number of up to four digits by a one-digit number, and multiply two two-digit numbers, using models, arrays, Distributive Property, partial product, and manipulatives. Students will also need to illustrate and explain their calculations by using equations, arrays, and/or area models. Students will begin to solve multi-step word problems using equations with a letter standing for an unknown quantity.

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

- Bar Diagram
- Base-Ten Blocks
- Grid Paper
- Number Line
- Place-Value Chart
- Rectangular Area Model
- Ruler
- Square Tiles
- Two-Color Counters

Teacher Note: Start emphasizing the Distributive Property for Multiplication, as it is the foundation for the partial products and area models for multiplication. Begin front-loading vocabulary for chapter 5; using academic language such as factors and multiples. Begin front-loading vocabulary for chapter 13 to support the concept of area.

Standards

Math Content Standards

MAFS.4.OA.1.1:
Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

MAFS.4.OA.1.a:
Determine whether an equation is true or false by using comparative relational thinking. *For example, without adding 60 and 24, determine whether the equation 60 + 24 = 57 + 27 is true or false.*

MAFS.4.OA.1.b:
Determine the unknown whole number in an equation relating four whole numbers using comparative relational thinking. *For example, solve 76 + 9 = n + 5 for n by arguing that nine is four more than five, so the unknown number must be four greater than 76.*

Cross Content Standards

LAFS.4.SL.1.1:
Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade *4 topics and texts*, building on others' ideas and expressing their own clearly.

a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
b. Follow agreed-upon rules for discussions and carry out assigned roles.
c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
d. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.

LAFS.4.SL.1.3:
Identify the reasons and evidence a speaker provides to support particular points.

MAFS.4.OA.1.2: Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison. **MAFS.4.OA.1.3:** Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. **MAFS.4.NBT.2.5:** Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	Suggested Standards for Mathematical Practice **MAFS.K12.MP.1.1:** Make sense of problems and persevere in solving them. • Can you state in your own words what the question is asking? • What are some multiplication strategies that might help you to find a solution? • Was there a point in solving the problems that you realized a different strategy? **MAFS.K12.MP.2.1:** Reason abstractly and quantitatively. • Can you explain what each of the numbers in the problem means? • Describe a time when an estimate is better than an exact answer. • How do you know when to round and when to use compatible numbers? **MAFS.K12.MP.4.1:** Model with Mathematics. • What can you do first before writing a number sentence for this problem? • How could you use a simpler problem to help you create a mathematical model for this situation? • How can you use a bar model to represent the number of hours a day you are awake, the number of hours you are asleep, and how many more hours you are awake than asleep? • What are the possible ways we could model this problem mathematically? **MAFS.K12.MP.8.1:** Look for and express regularity in repeated reasoning. • Is there a way to find 60 x 75 mentally? • How can place value help you when multiplying?

Big Idea(s)
Multiplication of Whole Numbers

Essential Outcome Question(s)
How can you use multiplication facts, place-value, and properties to solve multiplication problems? What strategies can you use to multiply one-digit numbers?

Conceptual Understandings	Essential Question(s)
• Develop flexibility in multiplication strategies. Be able to use strategies as long as they understand the strategy and it makes sense mathematically. • Use compensation as a strategy that makes use of mental math. • Use of area model to make mathematical connections to place value, expanded notation, number partitioning, basic fact concepts, and Distributive Property. • Understand comparison situations to determine what operation to use in real-world comparison problems.	• How are patterns and multiplication related? • How can multiplication properties help you find your products? • What types of problems can be solved by using multiplication? • How can you use models to multiply a multi-digit number by a one-digit number? • How can you use estimation to check your answer? • How does the partial products strategy use place-value? • How can you use place-value to multiply place values? • How can you choose the best method to multiply two-digit numbers?

<table>
<tr><th colspan="2">Aligned Learning Goals</th><th>District Adopted Materials</th><th>Supplemental Resources</th><th>Strategies for Differentiation</th></tr>
<tr><td rowspan="7">Multiply by 1-Digit Numbers
14 content + 1 progress monitoring check</td><td>Relate and solve multiplication equations and multiplicative and additive comparisons
(OA.1.1, OA.1.2)</td><td rowspan="7">Go Math!
Chapter 2

Achieve the Core Go Math Guidance Documents</td><td rowspan="7">• SMART Multiplication Fluency Practice
• Task Card: Perimeter Patterns
• CPALMS: Tutorials
• Reading Challenge
• CPALMS: Great Estimations!</td><td rowspan="7">Reteach & Enrichment Support: Multiply by 1-Digit Numbers

The above document provides opportunities for reteach and enrichment with the current aligned learning goal.</td></tr>
<tr><td>Multiply tens, hundreds, and thousands by whole numbers through ten
(NBT.2.5)</td></tr>
<tr><td>Estimate products by rounding and determine if exact answers to multiplication problems are reasonable
(NBT.2.5)</td></tr>
<tr><td>Use the Distributive Property to multiply a two-digit number by a one-digit number
(NBT.2.5)</td></tr>
<tr><td>Solve multi-step word problems involving multiplication
(OA.1.3)</td></tr>
<tr><td>Use the expanded form and partial products to multiply multi-digit numbers by a one-digit number
(NBT.2.5)</td></tr>
<tr><td>Use mental math, regrouping, and properties to multiply a multi-digit number by a one-digit number
(NBT.2.5)</td></tr>
</table>

Instructional Strategies and Resources

Students build on their knowledge of multiplication in terms of equal groups, arrays, and area, to include thinking of multiplication as a multiplicative comparison. i.e. 12 is 3 times as many as 4.

- Students must understand that an equation is a comparison between two amounts, showing that the amounts are equal, and two different comparison statements can interpret the same quantity.
- Using bar models will reinforce students' understanding of multiplication comparisons.

15

5	5	5
5		

15 is 3 times as many as 5.

15

3	3	3	3	3
3				

15 is 5 times as many as 3.

Relating the partial products method to the Distributive Property and using an area model as a tool will also help students visualize multiplication problems.

	1,000 +	200 +	30 +	5
4	4 x 1,000	4 x 200	4 x 30	4 x 5

4 x 1,235= (4 x 1,000) + (4 x 200) + (4 x 30) + (4 x 5)
= 4,000 + 800 + 120 + 20
= 4,940

$$\begin{array}{r} 1{,}235 \\ \underline{\times \quad 4} \\ 20 \\ 120 \\ 800 \\ \underline{+ \quad 4{,}000} \\ 4{,}940 \end{array}$$

Estimation is a key skill that will help students determine the reasonableness of their answers in computation problems.
Understanding that rounding up will create an overestimate and rounding down will create an underestimate are essential to checking for reasonableness.

Children's Literature:

- *The Best of Times* by Greg Tang
- *Amanda Bean's Amazing Dream* by Cindy Neuschwander
- *A Grain of Rice* by Helena Clare Pittman

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal assessments 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 2 Mid-Chapter Checkpoint
- Chapter 2 Diagnostic Interview
- Math Journal Entries
- Performance Task: Cars, Trains, Boats and Planes

MFAS Tasks 4.OA.1.1:
- Kate and Her Doll
- Pet Snakes
- Writing an Equation to Match a Word Problem
- Animal Photographs

MFAS Tasks 4.OA.1.2:
- Dogs as Pets
- Books and Yarn
- Throwing Footballs
- Making Necklaces

MFAS Task 4.NBT.2.5
- Reading Challenge

Multiply by 2-Digit Numbers 10 content + 1 progress monitoring check	Use place value and multiplication properties to multiply by tens *(NBT.2.5)*	Go Math! Chapter 3 Achieve the Core Go Math Guidance Documents	• Task Card: Multiplication Blueprint • CPALMS: “Express Yourself!” with Math Story Chains	Reteach & Enrichment Support: Multiply by 2-Digit Numbers The above document provides opportunities for reteach and enrichment with the current aligned learning goal.
	Use area models, place value, partial products, and regrouping to multiply two-digit numbers *(NBT.2.5)*			

Instructional Strategies and Resources

The focus during this instructional time is for students to see why and how we multiply each place; leading to the standard algorithmic approach.

- Using the area representation for multiplication will lead students to understanding partial product multiplication and further support understanding.

	10	6
20	200	120
4	40	24

200 + 120 + 40 + 24 = 384

From the model students should be able to represent the partial product model for 24 x 16

Students will model how to use place value and regrouping to find the product.

- Students have learned to use different strategies to multiply 2-digit numbers; they will practice strategies and find their most efficient method.
- Based on the standard; students must be proficient using strategies based on place value and the properties of operations; as well as using equations, rectangular arrays, and/or area models.

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal assessments 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 Diagnostic Interview
- Math Journal Entries

MFAS Task 4.OA.1.3:
- Estimating the Solution

MFAS Task 4.OA.1.a:
- True and False Multiplication Equations

MFAS Task 4.OA.1.b:
- Comparative Relational Thinking in a Multiplication Equation

MFAS Tasks 4.NBT.2.5
- The Produce Shop
- Partial Products
- Multiplying Using an Array or Area Model

Sample: Suggested Standards-based Checks – Blueprint
- One-Digit Multiplication; Scoring Rubric
- Two-Digit Multiplication; Scoring Rubric

Big Idea 3
Quarters 1 & 2

Academic Plan
Mathematics – Grade Four (Course #5012060)

Suggested Big Idea Length:
14 - 18 days

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Division of Whole Numbers*
Students will demonstrate division using one-digit divisors by four digit dividends, with and without a remainder and use estimation to check answers for reasonableness. Students will build conceptual understanding for division using strategies based on place-value, the properties of operations, and/or the relationship between multiplication and division. Division will be illustrated and explained by using equations, rectangular arrays, and/or area models.

Manipulatives: Below are some of the manipulatives that should be included in the instruction of Big Idea 3. View the attached document, Grade 4 Big Idea 3 Manipulatives, for a comprehensive list of manipulatives and their suggested usage during Big Idea 3.

- Base-Ten Blocks
- Number Line
- Grid Paper
- Square Tiles
- Multiplication Table
- Two-Color Counters

Standards

Math Content Standards	Cross Content Standards
MAFS.4.OA.1.3: Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. **MAFS.4.NBT.2.6:** Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	**LAFS.4.SL.1.1**: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade *4 topics and texts*, building on others' ideas and expressing their own clearly. a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion. b. Follow agreed-upon rules for discussions and carry out assigned roles. c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others. d. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion. **LAFS.4.SL.1.3**: Identify the reasons and evidence a speaker provides to support particular points.

	Suggested Standards for Mathematical Practice
	MAFS.K12.MP.2.1: Reason abstractly and quantitatively. • What is a situation that could be represented by this division equation? • Why does division represent the situation? **MAFS.K12.MP.4.1:** Model with mathematics. • Why is the rectangular area model a good model for this problem? • How can you use a simpler problem to help you find the quotient?

Big Idea(s)

Division of Whole Numbers

Essential Outcome Question(s)

How can you divide by one-digit numbers?

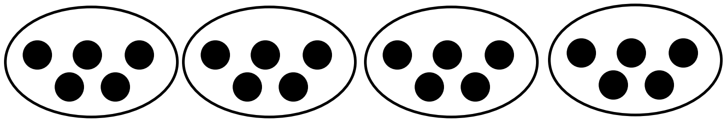
Conceptual Understandings	Essential Question(s)
• Use understanding of place value and basic facts to divide numbers through thousands by whole numbers through 10. • Build fluency with the standard division algorithm by emphasizing the meaning and logic that lie behind the algorithm. • Arrays provide powerful representation to visualize multi-digit division. • Understand how to use the distributive property to find quotients with base-ten block models and grid paper. • Use partial quotient method to solve division problems. • Apply basic division facts along with compatible numbers to estimate quotients. • Understand how to interpret a remainder in a variety of real-world situations.	• How is multiplication used to solve a division problem? • How can you use remainders in division problems? • How can you estimate quotients? • How can you model division with a one-digit divisor?

Aligned Learning Goals		District Adopted Materials	Supplemental Resources	Strategies for Differentiation
Divide by One-Digit Numbers 15 content + 1 progress monitoring check	Use inverse operations to show the relationship between multiplication and division to solve a division problem *(NBT.2.6)*	Go Math! Chapter 4 Achieve the Core Go Math Guidance Documents	• CPALMS: Share and Share Alike • CPALMS: Rockin' Remainders • CPALMS: One Step at a Time: Word Problems • CPALMS: Carnival Tickets	Reteach & Enrichment Support: Divide by One-Digit Numbers The above document provides opportunities for reteach and enrichment with the current aligned learning goal.
	Use the relationship between multiplication and division to divide *(NBT.2.6)*			
	Find whole-number quotients and remainders, and to illustrate and explain their calculation using equations and/or arrays. *(NBT.2.6)*			
	Use models to divide whole numbers to find and interpret remainders *(OA.1.3)*			
	Divide tens, hundreds, and thousands by whole numbers *(NBT.2.6)*			
	Use the Distributive Property to find quotients using models *(NBT.2.6)*			
	Use models to represent repeated subtraction and multiples to find quotients Use models to divide using Partial Quotients *(NBT.2.6)*			
	Divide multi digit numbers by 1-digit divisors *(NBT.2.6)*			
	Determine where to place the first digit of a quotient using place value *(NBT.2.6)*			
	Solve multi-step word problems involving division *(OA.1.3)*			

Instructional Strategies and Resources

As students begin to shift their thinking from multiplication to division, it is essential for teachers to reinforce the students' understanding that multiplication and division are inverse operations. By applying an understanding of this relationship students can make smooth transitions between these operations. To reinforce this understanding, allow students to build a model of a multiplication expression and then show how this model also depicts division.

Ex. Model the equation 4 x 5 = 20 using counters.



"This model represents 4 groups of 5, which is 20 counters in all."

How does this model also illustrate division?

"There are 20 counters in all. They are divided into 4 groups of 5."

When exploring two-digit division by a one-digit divisor, students may use their knowledge of multiplication to create list of multiples of the divisor to find the quotient or an estimation of the quotient.

Actual Quotient

Ex. 56 ÷ 4

"I know that 4 x 12 = 48. I can list the multiples of 4, beginning at 48, to determine the factor that will give a product of or near 56."

… 48, 52, 56…

"4 x 14 = 56, therefore 56 ÷ 4 = 14"

Estimated Quotient

Ex. 93 ÷ 7

"I know that 7 x 10 = 70. I can list the multiples of 7, beginning at 70, to determine the factor that will give a product of or near 93."

… 70, 77, 84, 91, 98…

"7 x 13 = 91, and 7 x 14 = 98 therefore 93 ÷ 7 has a quotient between 13 and 14."

As remainders come into play, students continue to draw on this understanding of factors and multiples to help them arrive at their solution. However, this should be used as an accompaniment to hands on exploration with a variety of manipulatives. Having had practice with creating models of division situations will help students create drawings and eventually form mental pictures to help them understand how to interpret remainders in a variety of different situations.

Add 1 to the quotient:
A class of 15 students arrives at the museum. If each tour group can be no larger than 4, how many groups will be led through the museum?

15 ÷ 4 = 3 r 3
There will be 4 tour groups.

Use only the remainder:
How many students will be in the last group?

15 ÷ 4 = 3 r 3
3 students will be in the last group

Use only the quotient:
How many full groups of 4 will the tour guide lead?

15 ÷ 4 = 3 r 3
There will be 3 full groups of 4.

"Students need extensive experience with a variety of practical situations that call for different interpretations of remainders," (Fuson, SanGiovanni & Adams, 2009)

- Depending on the context of the problem, students must interpret the problem situation and the question in order to solve.
- Understanding when and how to use the remainder is essential.

Students extend their understanding of the relationship between multiplication and division to include using models and conceptual strategies to solve.

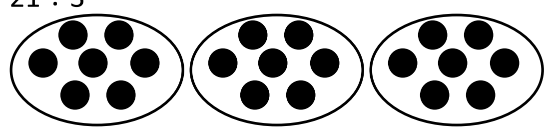
- **Repeated Subtraction / Partitioning:** As students first begin to explore division, it is often introduced as either repeated subtraction or partitioning of a set number of equal groups. Reinforcing students' understanding of these models leads to their development of the more comprehensive strategies to follow.

Repeated Subtraction

21 ÷ 3
21 – 3 = 18 *(1 time)*
18 – 3 = 15 *(2 times)*
15 – 3 = 12 *(3 times)*
12 – 3 = 9 *(4 times)*
9 – 3 = 6 *(5 times)*
6 – 3 = 3 *(6 times)*
3 – 3 = 0 *(7 times)*

Partitioning

21 ÷ 3



- **Distributive Property:** Teaching students how break down multi-digit numbers into their place values, helps to reinforce their understanding of the Distributive Property and creates a strategy for division that will aid their understanding of the standard algorithm for division.

- **Partial Quotients:** Partial Quotients is a more conceptual approach to the standard algorithm for long division and serves as a building block for reaching this algorithm. Students are able to pick any multiple of the divisor that they are comfortable with as long as it is smaller than the dividend. They subtract the multiple and then repeat this process until they have reached zero. The sum of the factors is the quotient.

Ex. 175 ÷ 5

	10	10	10	5
5	50	50	50	25
	175			

10 + 10 + 10 + 5 = 35

175 – 50 = 125
125 – 50 = 75
75 – 50 = 25
25 – 25 = 0

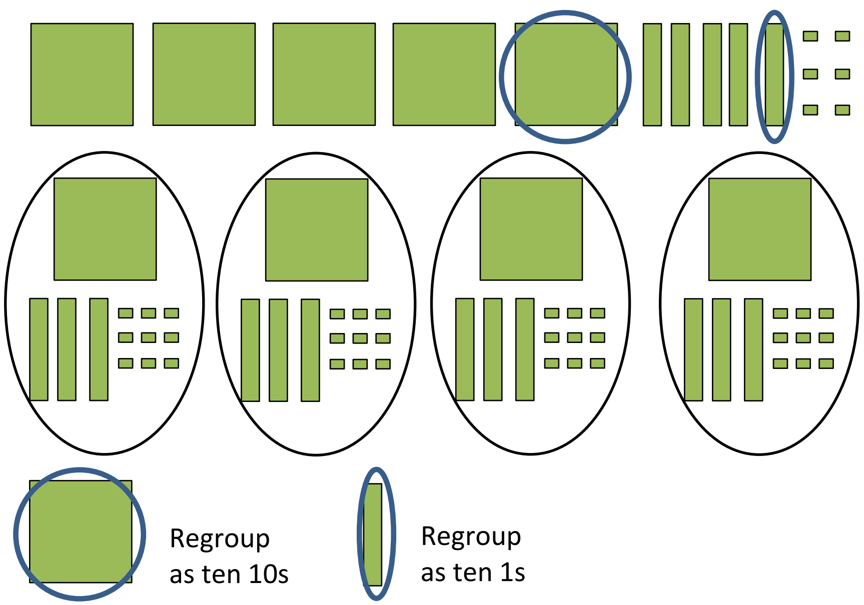
Relation to the Distributive Property
(5 x 10) + (5 x 10) + (5 x 10) + (5 x 5)
50 + 50 + 50 + 25
175

As the teaching of division progresses toward the use of the standard algorithm for long division, students need ample practice using place value blocks to fully understand this concept. Students must be comfortable regrouping with place value blocks in order to create accurate models.

After students are comfortable building and drawing models for multi-digit by one-digit division, it is helpful to begin teaching standard algorithm by connecting back to the steps students took while modeling with place-value blocks. This can be achieved through ha two-column approach where the modeling is done in the left column and the algorithm is built in the right column.

Modeling with Place Value Blocks

556 ÷ 4



Standard Algorithm

$$
\begin{array}{r|l}
 & 139 \\
\hline
4 & 556 \\
 & -4 \\
\hline
 & 15 \\
 & -12 \\
\hline
 & 36 \\
 & -36 \\
\hline
 & 0
\end{array}
$$

Step 1: Place an equal number of hundreds into each of the 4 groups.

Step 2: Regroup any remaining hundreds as ten 10s

Step 3: Place an equal number of tens in each of the groups

Step 4: Regroup the any remaining tens as ten 1s.

Step 5: Place an equal number of ones in each of the groups.

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal assessments 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 Diagnostic Interview
- Math Journal Entries

MFAS Tasks 4.OA.1.3:

- Picking Strawberries
- Roller Coaster Rides

MFAS Tasks 4.NBT.2.6:

- Dividing Using Place Value
- Dividing Using Area Model
- Book Drive
- Interpreting Division

Sample: Suggested Standards-based Check – Blueprint

- Division of Whole Numbers; Scoring Rubric

Big Idea 4
Quarter 2

Academic Plan
Mathematics – Grade Four (Course #5012060)

Suggested Big Idea Length:
4– 8 days

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Factors, Multiples, Patterns*
Students will learn about the patterns of numbers by identifying factors and multiples. They will also classify numbers by prime or composite. They will use this knowledge in Big Idea 5 to find equivalent fractions and common denominators. Students will generate and analyze patterns in order to explain a given rule.

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

- Grid Paper
- Square Tiles
- Hundred Chart
- Two-Color Counters
- Number Line
- Unit Cubes

Teacher Note:
Divisibility rules are not necessary for students to master MAFS.4.OA.2.4. Teachers should consider using MFAS Task Baseball Cards as linked below in the Formative Checkpoint section of the Academic Plan to supplement Lesson 5.6.

Standards

Math Content Standards	Cross Content Standards
MAFS.4.OA.2.4: Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite. **MAFS.4.OA.3.5:** Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*	**LAFS.4.SL.1.1**: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade *4 topics and texts*, building on others' ideas and expressing their own clearly. a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion. b. Follow agreed-upon rules for discussions and carry out assigned roles. c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others. d. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion. **Suggested Standards for Mathematical Practice** **MAFS.K12.MP.6.1:** Attend to precision.

	• How can you use 'factor' or 'multiple' in your explanation? **MAFS.K12.MP.7.1:** Look for and make use of structure. • When can a number be divisible by more than one number? • How are factors and multiples related?

Big Idea(s)
Factors, Multiples, and Patterns

Essential Outcome Question(s)
How can you find factors and multiples? How can you generate and describe number patterns?

Conceptual Understandings	**Essential Question(s)**
• Gain familiarity with factors and multiples. • Apply understanding of factors and multiples to the concepts of prime and composite numbers. • Understand the "why" for One not being prime or composite. • Understand patterns are sets of numbers or objects in an ordered way.	• How can you use models or lists to find factors? • How can you generate multiples of a given number? • How can you create a number pattern?

	Aligned Learning Goals	**District Adopted Materials**	**Supplemental Resources**	**Strategies for Differentiation**
Factors, Multiples, and Patterns 5 content + 1 progress monitoring check	Use models to find factors of a given number *(OA.2.4)*	Go Math! Chapter 5 Achieve the Core Go Math Guidance Documents	• Task Card: Find My Factor • Task Card: Growing Patterns • CPALMS – Fish Ahoy Fish • Illuminations: Multiplication – It's in the Cards: Looking for Patterns • Illuminations: Petals Around the Rose	Reteach & Enrichment Support: Factor, Multiples, and Patterns The above document provides opportunities for reteach and enrichment with the current aligned learning goal.
	Solve problems by using the strategy *make a list* *(OA.2.4)*			
	Understand the relationship between factors and multiples, and determine whether a number is a multiple of a given number *(OA.2.4)*			
	Determine if a number is prime or composite *(OA.2.4)*			
	Generate a number pattern and describe features of the pattern *(OA.3.5)*			

Instructional Strategies and Resources

In Big Idea 4, students will further apply their understanding of factors and multiples.

- Students must have a strong understanding of mathematical vocabulary and be precise when referring to factors and multiples.
- Students that have not yet mastered the vocabulary terms (multiples and factors) tend to use them interchangeably and must be helped to develop their conceptual understanding to understand that these terms have very different meanings.
- Confusion may stem from the fact that a single number may be both a factor and a multiple. For example, the number 9 is both a factor of 18 and a multiple of 3. Similarly, this confusion can also be derived from the fact that multiplying two factors results in a common multiple of each factor.

Identify the factors of 24.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	31	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

Identify the multiples of 3

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	31	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

Create learning situations that allow students to identify each term in isolation, but also allow for conversations to recognize the relationship between these terms.

As Big Idea 4 progresses, students will apply their understanding of factors and multiples to prime and composite numbers. Because the criteria for determining if a number is prime or composite is based on its number of factors, students must have achieved mastery of each of the terms: factor and multiple. A common misconception comes when determining if zero and one are either prime or composite.

- One (1) is neither prime nor composite because it only has one factor (itself); prime numbers must have exactly **two** factors.
- Zero (0) is not prime because it has an infinite number of factors; therefore, making it composite.
- Two (2) is the smallest (least) prime number.

The final concept of Big Idea 4 involves applying their understanding of factors and multiples to the creation and identification of patterns. At this time students will not investigate this standard in its entirety; geometric patterns will be explored during Big Idea 7. When given an ordered set of numbers, students will be encouraged to identify more than one pattern.

- In the pattern: 5, 10, 15, 20, 25, 30, students will most likely identify first that this pattern shows the multiples of 5.
- Students may also begin to identify that the ones place alternates between 5 and 0. Another pattern may be recognized as the terms alternate between even and odd.

As students begin to see that more than one pattern may exist within a single set of numbers, they can apply this reasoning when examining various structures.

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal assessments 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 Diagnostic Interview
- Math Journal Entries

MFAS Tasks 4.OA.2.4:

- Find All the Factor Pairs
- Multiples of Six
- Factor Pairs
- Prime or Composite

MFAS Tasks 4.OA.3.5:

- Multiply by Four
- Dot Patterns
- Baseball Cards

Sample: Suggested Standards-based Check – Blueprint

- Factors, Multiples, and Patterns; Scoring Rubric

Big Idea 5
Quarter 2

Academic Plan
Mathematics – Grade Four (Course #5012060)

Suggested Big Idea Length:
29 – 33 days

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Operations with Fractions*
Students will use concrete models and strategies to learn about equivalent fractions. Students will learn to reason about fractions and use strategies in order to compare and order fractions. Students will use concrete models and strategies to add and subtract fractions with like denominators. Throughout this Big Idea students will work flexibly with fractions to develop a deeper understanding of fractions. Students will use concrete models and strategies to multiply fractions by whole numbers.

Manipulatives: Below are some of the manipulatives that should be included in the instruction of Big Idea 5. View the attached document, Grade 4 Big Idea 5 Manipulatives, for a comprehensive list of manipulatives and their suggested usage during Big Idea 5.

- Bar Model
- Decimal Shade Model
- Fraction Circles
- Fraction Tiles
- Grid Paper
- Number Line
- Paper
- Pattern Blocks
- Tangram Patterns

Teacher Note:
Fractions with numerators larger than denominators are referred to as 'fractions greater than one'. Also, it is no longer in the 4th grade standard to reduce or simplify fractions, however, students must be able to identify and find equivalent fractions.

Standards	
Math Content Standards	Cross Content Standards
MAFS.4.NF.1.1: Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. **MAFS.4.NF.1.2:** Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. **MAFS.4.NF.2.3:** Understand a fraction a/b with a > 1 as a sum of fractions 1/b.	**LAFS.4.SL.1.1**: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade *4 topics and texts*, building on others' ideas and expressing their own clearly. a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion. b. Follow agreed-upon rules for discussions and carry out assigned roles. c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others. d. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion. **LAFS.4.SL.1.3**: Identify the reasons and evidence a speaker provides to support particular points.

a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.* c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction. d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem. **MAFS.4.NF.2.4:** Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. a. Understand a fraction a/b as a multiple of 1/b. *For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).* b. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)* c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*	Suggested Standards for Mathematical Practice **MAFS.K12.MP.2.1:** Reason abstractly and quantitatively. • How many addends are in the fraction addition equation? What doe each addend represent? • Why is it important to be able to write a fraction as a sum of fractions? **MAFS.K12.MP.4.1:** Model with mathematics. • How can you model finding an equivalent fraction using fraction tiles? • How many _______ size pieces did you use? What fraction can you write? **MAFS.K12.MP.5.1** Use appropriate tools strategically. • What tool could you use to help you solve the problem? • What strategy could you use to make the calculation easier? **MAFS.K12.MP.7.1:** Look for and make use of structure. • How did you discover a pattern for finding equivalent fractions? Will that process always work? • How is multiplying fractions like adding fractions?

Big Idea(s)
Operations with Fractions

Essential Outcome Question(s)
How can you model equivalent fractions? How can you model and solve addition and subtraction fraction problems with like denominators? How can you model and solve multiplication of a fraction by a whole number?

Conceptual Understandings	**Essential Questions**
• Understand how to use an area and linear model to represent equivalent fractions. • Understand benchmark fractions and reason about the size of fractions using numerator or denominator.	• How can you use the size of the pieces and models to help you compare and order fractions? • How can you find equivalent fractions? • How can you solve problems that involve fractions?

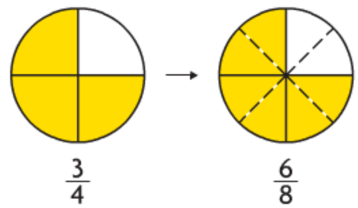
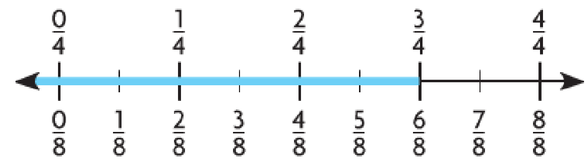
• Recognize and combine comparison strategies when ordering fractions. • It is important to develop flexible thinking about addition, subtraction and multiplication of fractions.	• Why do you add or subtract the numerators and not the denominators? • Why do you rename mixed numbers when adding or subtracting fractions? • How do you know that your sum or difference is reasonable? • How can you write a product of a whole number and a fraction as a product of a whole number and a unit fraction?

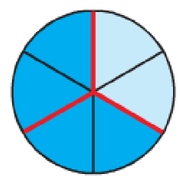
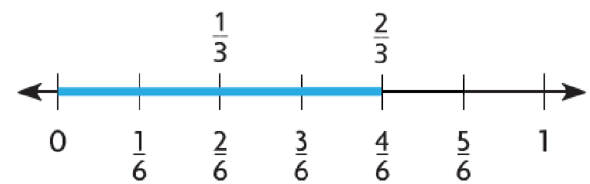
Aligned Learning Goals		District Adopted Materials	Supplemental Resources	Strategies for Differentiation
Fraction Equivalence and Comparisons 10 content + 1 progress monitoring check	Use models (number lines, rectangles, squares and circles) to show equivalent fractions *(NF.1.1)*	Go Math! Chapter 6 Achieve the Core Go Math Guidance Documents	• Task Card: Fraction Pizza • Task Card: Fraction Tree • Task Card: Fraction War • CPALMS Problem Solving Task: Running Laps • CPALMS Interactive game: Ordering Fraction Monkeys • CPALMS Interactive game: Fractions Dolphin Racing Game • CPALMS Problem Solving Task: Listing Fractions in Increasing Size	Reteach & Enrichment Support: Fraction Equivalence and Comparisons The above document provides opportunities for reteach and enrichment with the current aligned learning goal.
	Generate equivalent fractions with and understanding of $\frac{1 \text{ x } a}{1 \text{ x } b}$ *(NF.1.1)*			
	Use equivalent fractions to create a pair of fractions with a common denominator *(NF.1.1)*			
	Compare and order fractions on a number line using benchmarks, common numerators, and common denominators *(NF.1.2)*			

Instructional Strategies and Resources

In Big Idea 5, students will build upon their basic understanding of writing/identifying fractions, comparing/ordering of fractions, and fraction equivalence from third grade. Students will now deepen their understanding of equivalent fractions, begin adding and subtracting fractions and multiply fractions by whole numbers. The teaching of this Big Idea should begin with building a strong foundation using fraction models.

An initial strategy for finding equivalent fractions is to break apart or combine sections. Both of these strategies may be accomplished by modeling through area and linear models.

Break Apart Strategy		
Use models to create fractions equivalent to $\frac{3}{4}$.	**Area Model:**  *By breaking each of the fourths in half, the unit fraction becomes eighths. Six of those sections are shaded making the equivalent fraction of* $\frac{6}{8}$.	**Linear Model:**  *By dividing each of the* $\frac{1}{4}$ *sections in half, the unit fraction becomes eighths. This results in a length that is six* $\frac{1}{8}$*-length sections or* $\frac{6}{8}$.

Combining Sections Strategy (Simplifying)		
Use models to create fractions equivalent to $\frac{4}{6}$.	**Area Model:**  *By combining groups of* $\frac{2}{6}$ to make sections that are each $\frac{1}{3}$, *the shaded region is equivalent to* $\frac{2}{3}$.	**Linear Model:**  *By combining sections of* $\frac{2}{6}$ to make sections that are each $\frac{1}{3}$, *the length is shown as equivalent to* $\frac{2}{3}$.

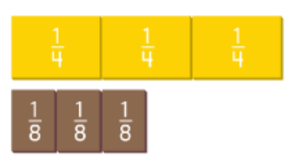
"The general approach to helping students create an understanding of equivalent fractions is to have them use models to find different names for a fraction." (Van de Walle, 2007)

When comparing and ordering fractions, students may rely on strategies such as using benchmark fractions, comparing common numerators, and comparing common denominators.

- Using the benchmarks like ½ and 1 to compare fractions helps students as they begin to estimate fraction sums and differences.
- When fractions have common numerators, students can compare the size of the denominator to determine which is greater.

Example:

Compare the fractions $\frac{3}{4}$ and $\frac{3}{8}$.

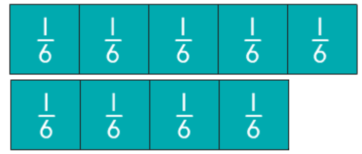


Eighths are smaller than fourths, therefore, $\frac{3}{8}$ *is smaller than* $\frac{3}{4}$.

- In situations when fractions have a common denominator, they can be compared by determining that the pieces are all the same size. Therefore, the fraction with the greater numerator is the greater fraction.

Example:

Compare the fractions $\frac{5}{6}$ and $\frac{4}{6}$.



There are more sixths in five sixths than four sixths, so $\frac{5}{6}$ is greater than $\frac{4}{6}$.

- Students combine comparison strategies when ordering fractions such as $\frac{5}{7}$, $\frac{1}{4}$, $\frac{5}{9}$, and $\frac{6}{7}$ from least to greatest. One-fourth is the least because it is the only fraction less than one-half. Students then determine that $\frac{5}{9}$ is less than $\frac{5}{7}$ because ninths are smaller than sevenths. The final determination is that $\frac{6}{7}$ is the greatest because it has more sevenths than $\frac{5}{7}$.

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal assessments 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 6 Mid-Chapter Checkpoint
- Chapter 6 Diagnostic Interview
- Math Journal Entries

MFAS Tasks 4.NF.1.1:
- Are the Fractions Equivalent
- Equivalence Using A Number Line
- Equivalent Fractions on a Number Line
- Eating Cake

MFAS Tasks 4.NF.1.2:
- Compare Fractions
- Comparing Four-Fifths and Three-Fourths
- Comparing Fractions Using Benchmark
- Corn Farms

Add and Subtract Fractions 12 content + 1 progress monitoring check	Add and subtract fractions using models *(NF.2.3.d, NF.2.3.b)* Rename fractions and mixed numbers *(NF.2.3.b)* Add and subtract fractions with renaming *(NF.2.3.c)*	Go Math! Chapter 7 Achieve the Core Go Math Guidance Documents	• CPALMS Problem Solving Task: Making 22 Seventeenths in Different Ways • CPALMS Lesson Plan: Learning to Love Like Denominators • CPALMS Tutorial: The Leftover Dessert Dilemma	Reteach & Enrichment Support: Addition of Fractions Reteach & Enrichment Support: Subtraction of Fractions The above document provides opportunities for reteach and enrichment with the current aligned learning goal.

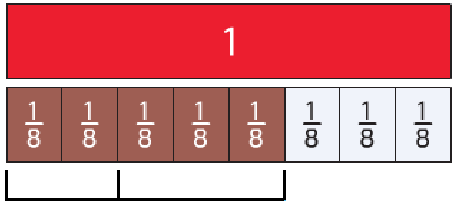
Instructional Strategies and Resources

When introducing addition and subtraction of fractions to students, it is important to once again begin with models. When teachers jump straight to showing students how to find common denominators and then add or subtract the numerators, students often make mistakes because they can't visualize the change that is taking place during the operation. A common mistake made by students is to add the numerator and the denominator rather than just adding the numerators.

Placing a strong emphasis on the use of models and development of accurate vocabulary to describe these models.

Example:

Add the fractions

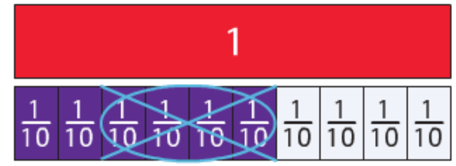


$\frac{2}{8} + \frac{3}{8} = \frac{5}{8}$

Combine two eight-size pieces and three eighth-size pieces for a total of 5 eighth-size pieces or $\frac{5}{8}$ *of the whole.*

Example:

Subtract the fractions



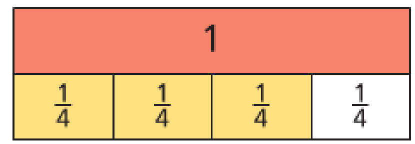
$\frac{6}{10} - \frac{4}{10} = \frac{2}{10}$

Cross out to subtract four tenth-size pieces to determine the difference of two tenth-size pieces or $\frac{2}{10}$ *of the whole.*

Teaching students to reason about addition and subtraction of fractions will allow students to compute more efficiently. Two methods for reasoning about fractions come from building a solid understanding of number sense and applying properties.

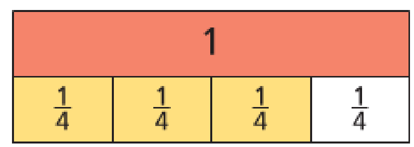
- It is beneficial for students to develop a flexible understanding of how to represent fraction sums.

Understanding that $\frac{3}{4}$ can also be represented as $\frac{1}{4} + \frac{1}{4} + \frac{1}{4}$.



- Another number sense related strategy is to determine a number's closeness to one.

Determining that $\frac{3}{4}$ is only $\frac{1}{4}$ away from 1 may be a helpful strategy when adding two fractions and predicting if the sum will be greater or less than 1.



- Learning to apply the properties of operations to fractions may lead to a student's ability to make mental calculations to check the reasonableness of their solution.

Example:

Solve the expression

$3\frac{2}{4} + 1\frac{1}{4} + 2\frac{3}{4}$

A student with a strong understanding of the Associative Property of Addition may choose the solution path below.

$3\frac{2}{4} + (1\frac{1}{4} + 2\frac{3}{4})$

The student chose to add $1\frac{1}{4} + 2\frac{3}{4}$ first because $\frac{1}{4} + \frac{3}{4} = 1$.

$1 + 2 + 1 = 3$

$3 + 3\frac{2}{4} = 6\frac{2}{4}$

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal assessments 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 7 Mid-Chapter Checkpoint
- Chapter 7 Diagnostic Interview
- Math Journal Entries

MFAS Tasks 4.NF.2.3:

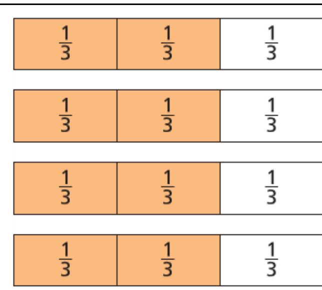
- Adding and Subtracting Mixed Numbers
- Decomposing Three-Fifths
- Anna Marie and the Pizza
- Fraction Word Problems

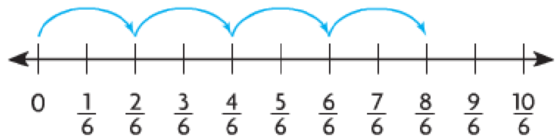
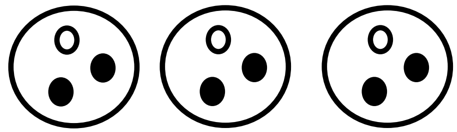
Multiply Fractions by Whole Numbers 6 content + 1 progress	Write a fraction as a product of a whole number and unit fraction using models to solve a problem *(NF.2.4.a)* Multiply a mixed number by a whole number *(NF.2.4.b)*	Go Math! Chapter 8 Achieve the Core Go Math Guidance Documents	• CPALMS Problem Solving Task: Sugar in Six Cans of Soda • CPALMS Lesson Plan: Modeling Multiplication with Fractions • CPALMS Lesson Plan: Modeling Multiple Groups of Fractions	Reteach & Enrichment Support: Multiply Fractions by Whole Numbers The above document provides opportunities for reteach and enrichment with the current aligned learning goal.

Instructional Strategies and Resources

Students enter fourth grade with a strong understanding of the multiplication of whole numbers. As they being to extend this understanding to multiplication of whole numbers and fractions, students may experience a difficulty understanding that the product will no longer be equal to or larger than either of the factors, as was the case with whole number operations. Students will need to build the foundational understanding that when multiplying a whole number by a fraction between 0 and 1, the product will be less than the greater factor. To create a well-developed understanding of multiplication of fractions by whole numbers several instructional strategies for the development of fraction operation sense should be included.

- Allow students multiple methods to represent fraction operations, such as: area models, scalar models with number lines, and set models using counters.
- Teacher and student created real-world examples should be used to help learners understand and visualize the effects of multiplication.
- Students should have opportunities applying estimation to fraction operations as well to help check the understanding of the expected outcome of multiplication of fraction by whole numbers.

Area Model Example: Find the product of 4 x $\frac{2}{3}$		*If* $\frac{2}{3}$ *equals* $\frac{1}{3}+\frac{1}{3}$ *or* $2 \times \frac{1}{3}$ *then* $4 \times \frac{2}{3}$ *equals* $4 \times 2 \times \frac{1}{3}$ *If* $4 \times 2 \times \frac{1}{3} = 8 \times \frac{1}{3}$, *then* $8 \times \frac{1}{3} = \frac{1}{3}+\frac{1}{3}+\frac{1}{3}+\frac{1}{3}+\frac{1}{3}+\frac{1}{3}+\frac{1}{3}+\frac{1}{3} = \frac{8}{3}$

Scalar Model Example: Find the product of 4 x $\frac{2}{6}$.		*Starting at zero, 4 jumps of $\frac{2}{6}$ will land at $\frac{8}{6}$; therefore 4 x $\frac{2}{6} = \frac{8}{6}$.*
Set Model Example: Find the product of 3 X $\frac{2}{3}$.		If $\frac{2}{3}$ of each group is shaded, then 3 of these groups would equal $\frac{2}{3} + \frac{2}{3} + \frac{2}{3} = \frac{6}{3}$.

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal assessments 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 8 Mid-Chapter Checkpoint
- Chapter 8 Diagnostic Interview
- Math Journal Entries

MFAS Tasks 4.NF.2.4:
- Fractions and Multiples
- How Many One Fourths?
- How Much Sugar?
- Training for a Race

Sample: Suggested Standards-based Checks – Blueprint
- Fraction Equivalence; Scoring Rubric
- Addition and Subtraction of Fractions; Scoring Rubric
- Multiplication of Fractions by Whole Numbers; Scoring Rubric

Big Idea 6
Quarters 2 and 3

Academic Plan
Mathematics – Grade Four (Course #5012060)

Suggested Big Idea Length:
8 – 12 days

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Decimals*
Students will use models to demonstrate their understanding of decimals and translate base-ten fractions as decimals. Throughout this Big Idea, students will transfer their knowledge of fractions and whole numbers to decimals. Students will connect fractions and decimals by using tools such as decimal shade models and number lines.

Manipulatives: Below are some of the manipulatives that should be included in the instruction of Big Idea 6. View the attached document, Grade 4 Big Idea 6 Manipulatives, for a comprehensive list of manipulatives and their suggested usage during Big Idea 6.

- Base-Ten Blocks
- Decimal Shade Model
- Fraction Circles
- Fraction Tiles
- Grid Paper
- Number Line
- Place-Value Chart
- One Dollar Bills, Coins

Standards

Math Content Standards	Cross Content Standards
MAFS.4.NF.3.5: Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. *For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.* **MAFS.4.NF.3.6:** Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.* **MAFS.4.NF.3.7:** Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model. **MAFS.4.MD.1.2:** Use the four operations to solve word problems[1] involving distances, intervals of time, and money, including problems involving simple fractions or decimals[2]. Represent fractional quantities of distance and intervals of time using linear models. ([1]See glossary Table 1 and Table 2) ([2]Computational fluency with fractions and decimals is not the goal for students at this grade level.)	**LAFS.4.SL.1.1**: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade *4 topics and texts*, building on others' ideas and expressing their own clearly. a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion. b. Follow agreed-upon rules for discussions and carry out assigned roles. c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others. d. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion. **Suggested Standards for Mathematical Practice** **MAFS.K12.MP.7.1:** Look for and make use of structure. • How can you represent ½ as a decimal? • What pattern can you follow to record fractions and decimals?

<table>
<tr><td></td><td>MAFS.K12.MP.8.1:
Look for and express regularity in repeated reasoning.
How are 1.5 and $1\frac{5}{10}$ the same and how are they different?
What does three and twenty-five hundredths mean?
How can you use reasoning to compare 0.3 and 0.03?</td></tr>
</table>

Big Idea(s)

Relate Fractions and Decimals

Essential Outcome Question(s)

How can you write and compare decimals?
How can you relate decimals to fractions?

<table>
<tr><th>Conceptual Understandings</th><th>Essential Questions</th></tr>
<tr><td>Understand that fractions with a denominator of 10 or 100 can be represented in decimal form.
Understand that decimals can be translated to fractions, word form, place value and money.
Recognize that comparisons are valid only when the decimals/fractions refer to the same whole.
It is important to develop proficiency when reasoning to compare decimals, rather than rely on an algorithm.</td><td>How can you record tenths and hundredths as fractions or decimals?
How can you find equivalent fractions and decimals?
How can you solve problems that involve money with decimals?
Why do you use a common denominator to add fractions?
Why do you rename fractions as decimals, and decimals as fractions?
When do you need to compare decimals?
How do you know which decimal is less, or greater?
How can you write a fraction as a decimal; and a decimal as a fraction?</td></tr>
</table>

<table>
<tr><th colspan="2">Aligned Learning Goals</th><th>District Adopted Materials</th><th>Supplemental Resources</th><th>Strategies for Differentiation</th></tr>
<tr><td rowspan="5">Relate Fractions and Decimals
9 content + 1 progress monitoring check</td><td>Record tenths and hundredths as fractions and decimals
(NF.3.6)</td><td rowspan="5">Go Math!
Chapter 9

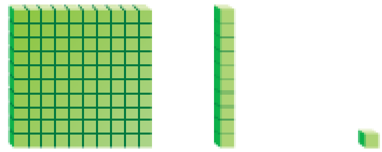
Achieve the Core Go Math Guidance Documents</td><td rowspan="5">CPALMS: Fractions Undercover!
CPALMS: Supermarket Sweep!
CPALMS – MEA: Playground Picks
CPALMS – MEA: Money Managers!</td><td rowspan="5">Reteach & Enrichment Support: Decimals

The above document provides opportunities for reteach and enrichment with the current aligned learning goal.</td></tr>
<tr><td>Relate and translate among fractions, decimals, and money
(MD.1.2)</td></tr>
<tr><td>Use strategies to solve word problems involving money
(MD.1.2)</td></tr>
<tr><td>Add fractions with denominators 10 or 100 (NF.3.5)</td></tr>
<tr><td>Compare decimals by reasoning about their size
(NF.3.7)</td></tr>
</table>

Instructional Strategies and Resources

In Big Idea 6, students will expand upon their understanding of fractions to include base-ten fractions and their conversion to decimals. Students will learn that fractions with a denominator that is a multiple of ten can easily be represented as a fraction. Students will also begin to connect that equivalent fractions and decimals are read in the exact same manner, for example: forty-five hundredths = 0.45 = $\frac{45}{100}$. When students first explore this concept, it is essential to use place value blocks to help students create a concrete understanding of each place value.

To create a concrete model of decimal values, place value blocks may be used in a manner similar to the example to the right. Make sure that the first step is identifying the representation of 1 and then progressively growing smaller (to the right of the decimal). This visual helps students to understand the difference between each place value by referring to the size of the units in each model.



Other models that can prove beneficial as students move into the representational stage of understanding include the use of decimal squares and number lines.

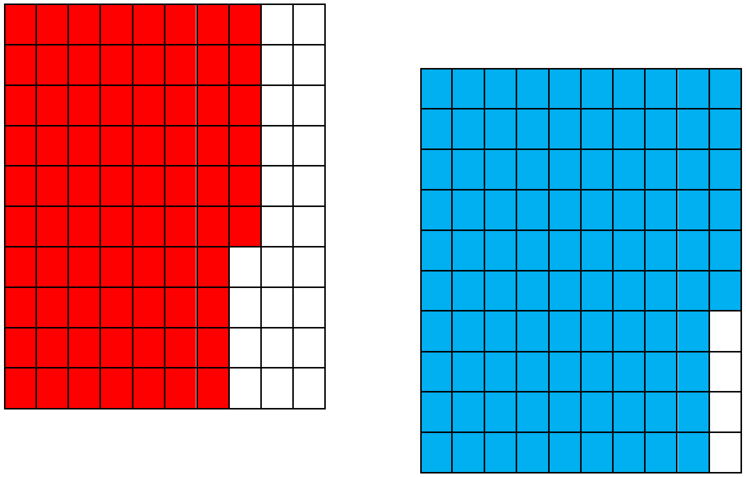
Students will develop their understanding of a decimal fraction by building upon their understanding of the place value system and using common language. When reading the aforementioned value, forty-five hundredths = 0.45 = $\frac{45}{100}$, students will also gain the understanding that 0.45 is 4 tenths and 5 hundredths, or $\frac{4}{10} + \frac{5}{100}$. Building this comprehensive understanding of the mathematical concept and language, students are able to translate to and from multiple forms: fractions, decimals, word form, place value, and money.

Fraction	Decimal	Word Form	Place Value	Money
$\frac{45}{100}$	0.45	forty-five hundredths	$\frac{4}{10} + \frac{5}{100}$ 4 tenths, 5 hundredths	\$0.45; 4 dimes, 5 pennies
$3\frac{95}{100}$	3.95	three and ninety-five hundredths	$3 + \frac{9}{10} + \frac{5}{100}$ 3 and 9 tenths, 5 hundredths	\$3.95; 3 dollars and 9 dimes, 5 pennies

When comparing decimals, students will again use the understandings that they have formed with whole numbers and apply them to decimals; this helps students achieve transfer, but may also cause the formation of initial misconceptions. Students tend to find decimals that have the same number of place values easier to compare. The example *0.76 < 0.96* is easier to compare than *0.76 < 0.9* because students can mentally compare 76 < 96, but then visualize 76 > 9 rather than 76 < 90. This relation to comparing whole numbers may lead to early confusion for learners. Using concrete and visual models helps to see the place values that are being compared.

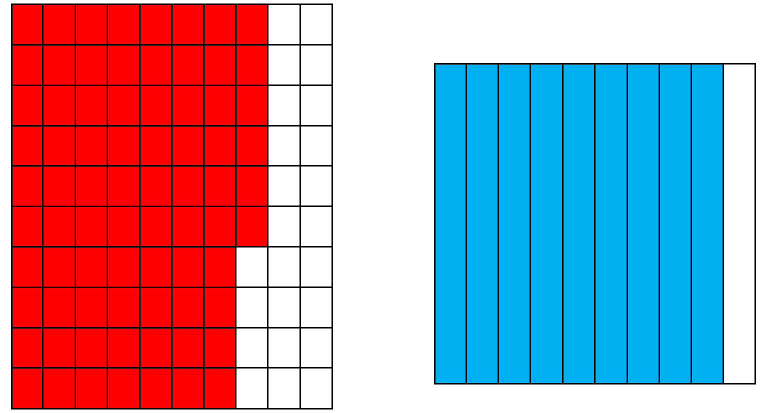
Comparing Decimals with the Same Number of Place Values

Example 0.76 < 0.96



Comparing Decimals with the a Different Number of Place Values

Example 0.76 < 0.9



Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal assessments 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 9 Mid-Chapter Checkpoint
- Chapter 9 Diagnostic Interview
- Math Journal Entries

MFAS Tasks 4.NF.3.5:
- Tenths and Hundredths
- Hundredths and Tenths
- Seven Tenths
- Adding Five Tenths

MFAS Tasks 4.NF.3.6:
- Using Benchmark Decimals on a Number Line
- Using Benchmark Fractions on a Number Line
- Fractions to Decimals
- Decimals to Fractions

MFAS Tasks 4.NF.3.7:
- Compare Decimals
- Comparing Four Tenths
- Using Models to Compare Decimals
- Comparing Decimals in Context

MFAS Tasks 4.MD.1.2:
- Shopping List
- Remote Control Motorcycle

Sample: Suggested Standards-based Check – Blueprint
- Relating Fractions and Decimals; Scoring Rubric

Big Idea 7
Quarter 3

Academic Plan
Mathematics – Grade Four (Course #5012060)

Suggested Big Idea Length:
18 – 22 days

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Properties of Geometric Figures*
Students will explore angle and angle measurements by using a protractor to draw benchmark angles. Students will also classify angles as acute, obtuse, right, or straight and relate them to benchmark angles and the corresponding degree.

Manipulatives: Below are some of the manipulatives that should be included in the instruction of Big Idea 7. View the attached document, Grade 4 Big Idea 7 Manipulatives, for a comprehensive list of manipulatives and their suggested usage during Big Idea 7.

- Fraction Circles
- Pattern Blocks
- Grid Paper
- Protractor
- Paper (folding)
- Ruler
- Paper Polygons
- Toothpicks, Straws, Craft Sticks

Standards

Math Content Standards	Cross Content Standards
MAFS.4.G.1.1: Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. **MAFS.4.G.1.2:** Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles. **MAFS.4.G.1.3:** Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry. **MAFS.4.OA.3.5:** Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.* **MAFS.4.MD.3.5:**	**LAFS.4.SL.1.1**: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade *4 topics and texts*, building on others’ ideas and expressing their own clearly. a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion. b. Follow agreed-upon rules for discussions and carry out assigned roles. c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others. d. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion. Suggested Standards for Mathematical Practice **MAFS.K12.MP.1.1:** Make sense of problems and persevere in solving them. • Can you state in your own words what the question is asking? • Was there a point in solving the problems that you realized a different strategy? **MAFS.K12.MP.5.1**

<table>
<tr><td>Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:
a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a “one-degree angle,” and can be used to measure angles.
b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.
MAFS.4.MD.3.6:
Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
MAFS.4.MD.3.7:
Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.</td>
<td>Use appropriate tools strategically.
• What tool could you use to help you solve the problem?
• What strategy could you use to make the calculation easier?

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

MAFS.K12.MP.7.1:
Look for and make use of structure.
• How did you discover a pattern for finding equivalent fractions? Will that process always work?
• How is multiplying fractions like adding fractions?</td></tr>
<tr><th colspan="2">Big Idea(s)</th></tr>
<tr><td colspan="2">Properties of Geometric Figures</td></tr>
<tr><th colspan="2">Essential Outcome Question(s)</th></tr>
<tr><td colspan="2">• How can you classify two-dimensional figures based upon their attributes?
• How can you measure angles and solve problems involving angle measures?</td></tr>
<tr><th>Conceptual Understandings</th><th>Essential Question(s)</th></tr>
<tr><td>• Understand that attributes of two-dimensional figures can classify shapes into categories.
• Shapes are named based on their attributes, not on their appearance.
• Recognize that a figure can have more than one line of symmetry.
• Understand that an angle is measured with reference to a circle.</td>
<td>• How can you use fractions and degrees to understand angle measures?
• How can you use a protractor to measure and classify angles?
• How can equations help you find the measurement of an angle?
• How can you identify and draw two-dimensional objects?
• How can you identify and draw two-dimensional shapes?
• How can you identify and draw lines of symmetry?
• How can you identify shape patterns?</td></tr>
</table>

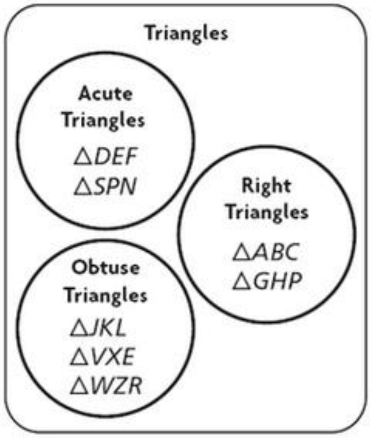
Aligned Learning Goals		District Adopted Materials	Supplemental Resources	Strategies for Differentiation
Two- Dimensional Figures 10 content + 1 progress monitoring check	Identify and draw the following two-dimensional objects: point, line, line segment, ray, right angle, acute angle, obtuse angle, straight angle, perpendicular lines, and parallel lines *(G.1.1)*	Go Math! Chapter 10 Achieve the Core Go Math Guidance Documents	• CPALMS: Points, Lines, and Angles, Oh My! • CPALMS: Geometric Map Makers • CPALMS: Snowflake Geometry: No Two Alike! • CPALMS: All About Angles	Reteach & Enrichment Support: Two-Dimensional Figures The above document provides opportunities for reteach and enrichment with the current aligned learning goal.
	Identify and classify triangles by side lengths (equilateral, isosceles, scalene) and angle measures (acute, obtuse, right) *(G.1.1 and G.1.2)*			
	Identify and classify two-dimensional shapes into categories based upon attributes *(G.1.2)*			
	Identify and draw lines of symmetry *(G.1.3)*			
	Identify and build shape patterns *(OA.3.5)*			

Instructional Strategies and Resources

In Big Idea 7, students will expand upon their understanding of analyzing and classifying two-dimensional geometric figures. As students begin exploring polygons, especially quadrilaterals, their knowledge of how to define each figure must have a greater level of precision than was required in previous grades. Students must be able to categorize shapes as well as create subcategories based on their unique characteristics. A student's ability to apply these definitions is evidence of a strong conceptual understanding of two-dimensional figures. To help students reach this level of understanding, it is important to have students create definitions in their own words for each polygon based on their own observations. Pairing this with an activity leading students through classification activities will help students to check the accuracy of their definitions. Although it may seem much easier to simply give students the definition, writing their own and checking its accuracy leads to students taking ownership of this process and yields a higher level of understanding.

Example: *In the Venn diagram to the right, explain which triangles do not have an obtuse triangle.*

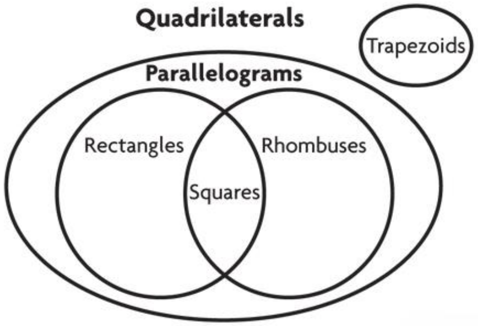
Triangles ΔDEF, ΔSPN, ΔABC, and ΔGHP do not have obtuse angles because acute and right triangles cannot have any obtuse angles.



Example: *In the Venn diagram to the right, draw or place one example in each category.*

Students are given the option of using concrete manipulatives or showing their ability to draw an example for each of the categories. Students should be supplied with at least one example for each category.

Another similar use of this activity involves placing figures in an incorrect category and having students classify them correctly and justify their new, correct position.



As students progress through Big Idea 7, they will also investigate the concept of symmetry. When exploring line symmetry, students benefit from having the opportunity to fold objects on suspected lines of symmetry to test for congruent parts on each side of the line that match up when folded. Many students will look at a parallelogram and assume that it is symmetrical because when divided there are two seemingly symmetrical pieces; however, they do not overlap when folded. This hands-on "test" for symmetry allows students to call on personal experiences and reason abstractly when looking at two dimensional representations of shapes and trying to create their own lines of symmetry.

Children's Literature:

- The Greedy Triangle by Marilyn Burns

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal assessments 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 10 Mid-Chapter Checkpoint
- Chapter 10 Diagnostic Interview
- Math Journal Entries

MFAS Task 4.OA.3.5:
- Shape Patterns

MFAS Task 4.G.1.1:
- Lines, Rays, and Line Segments
- Locating Points, Lines, and Rays
- Parallel and Perpendicular Sides
- All About Angles

MFAS Task 4.G.1.2:
- Grouping Triangles
- Sketching Quadrilaterals
- Sketching Triangles

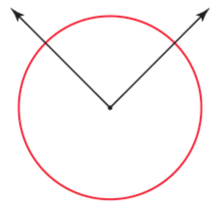
MFAS Task 4.G.1.3:
- Squares and Lines of Symmetry
- Using Lines of Symmetry
- Line Symmetry
- Identifying and Explaining Symmetry

Classifying and Drawing Angles 8 content + 1 progress monitoring check	Relate angles and degrees to fractional parts of a circle *(MD.3.5.a)* Use a protractor to measure an angle and draw an angle with a given measure *(MD.3.6)* Determine the measure of an angle separated into parts *(MD.3.7)* Use the strategy draw a diagram to solve angle measurement problems *(MD.3.6)*	Go Math! Chapter 11 Achieve the Core Go Math Guidance Documents	• Task Card: Zoo Angles	Reteach & Enrichment Support: Angles The above document provides opportunities for reteach and enrichment with the current aligned learning goal.

Instructional Strategies and Resources

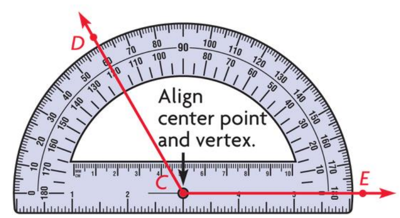
The second half of Big Idea 7 involves students building an extremely detailed understanding of the concept of angles. The MAFS call for students to approach angles through their relationship to circles. An angle is measured as the portion of a circle (360 degrees) that the "mouth" of an angle is open to. Because students are familiar with circles as geometric figures and through their exploration of fractions, students can call on past experiences and prior knowledge to build this new understanding.

One way to help students see this relationship is to give them a circle with a marked center and let them choose two points on the circle. By then connecting each of these points to the center, an angle is created.



Students may see this angle as opening to contain one fourth of the circle. Students may look at this as one fourth of 360 degrees or 360 degrees divided by 4, both of which equal 90 degrees.

While studying the concept of angles, students will also look to measure angles using protractors as well as classifying them. When measuring angles, there are three helpful pieces to teach students regarding the protractors. Students must first understand that the center point of the protractor must align on the vertex of the angle. The second piece is understanding how to place the zero mark along one of the rays of the angle. Finally, a third method that proves helpful for students is helping them to build comfort with extending the rays of an angle to ensure that they *reach* the protractor.



Once students have built comfort measing angles, they begin to classify these angles. In Big dea 7, angles may be classified as either acute , obtuse, right, or strainght angles. Each classification is defined by the criteria below:

- *Acute angle*- an angle measuring greater then 0 degrees but less than 90 degrees.
- *Obtuse angle*- an angle measuring greater than 90 degrees, but less than 180 degrees.
- *Right angle*- an angle measuring exactly 90 degrees.
- *Straight angle*- an angle measuring exactly 180 degrees. Often referred to as straight lines.

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal assessments 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 11 Mid-Chapter Checkpoint
- Chapter 11 Diagnostic Interview
- Math Journal Entries

MFAS Task 4.MD.3.5:
- Lawn Sprinkler
- Circle the Angles
- This Angle
- Determining An Angle's Measure

MFAS Task 4.MD.3.6:
- Town of Happyville
- Using a Protractor to Draw Angles
- Measuring Angles With a Protractor
- Drawing and Measuring Angles

MFAS Task 4.MD.3.7:
- What Is the Measure of the Angle?
- Using Known Angles
- Turns on a Skateboard
- Understanding Angles

Sample: Suggested Standards-based Check – Blueprint
- Two-Dimensional Figures; Scoring Rubric
- Classifying and Drawing Angles; Scoring Rubric

Big Idea 8
Quarter 3

Academic Plan
Mathematics – Grade Four (Course #5012060)

Suggested Big Idea Length:
22 – 26 days

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Measurement*
Students will learn about customary and metric units including length, weight, and liquid volume and use them to compare to benchmark and real world items. Students will use their knowledge of line plots to make and interpret fractional data. Students will use models and line charts to compare units of time and elapsed time. Students will also be exposed to number patterns when comparing units of measurement. Finally, students will expand their knowledge of perimeter to area and understand the equation A=b X h.

Manipulatives: Below are some of the manipulatives that should be included in the instruction of Big Idea 8. View the attached document, Grade 4 Big Idea 8 Manipulatives, for a comprehensive list of manipulatives and their suggested usage during Big Idea 8.

- Analog Clock Faces
- Base-Ten Blocks
- Customary Containers
- Dot Paper
- Fraction Tiles
- Grid Paper
- Number Line
- Pan Balance
- Ruler, Yardstick, Meter Stick
- Square Sticky Notes
- Square Tiles
- T-Chart

Teacher Note:
For Standard MAFS.4.MD.1.1 provide students with access to the FSA Reference Sheet. Omit Lesson 12.6 as standard MAFS.4.MD.1.1 does not require converting with decimeters.

Standards	
Math Content Standards	Cross Content Standards
MAFS.4.MD.1.1: Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft. snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...* **MAFS.4.MD.1.2:** Use the four operations to solve word problems involving distances, intervals of time, and money, including problems involving simple fractions or decimals. Represent fractional quantities of distance and intervals of time using linear models.	**LAFS.4.SL.1.1**: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade *4 topics and texts*, building on others' ideas and expressing their own clearly. a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion. b. Follow agreed-upon rules for discussions and carry out assigned roles. c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others. d. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.

MAFS.4.MD.2.4: Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.* **MAFS.4.MD.1.3:** Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*	**LAFS.4.SL.1.3:** Identify the reasons and evidence a speaker provides to support particular points. Suggested Standards for Mathematical Practice **MAFS.K12.MP.1.1:** Make sense of problems and persevere in solving them. • Is there another way to find the area of the shape? • What is another way to find the number of ounces in 4 pounds? **MAFS.K12.MP.2.1:** Reason abstractly and quantitatively. • How do you know what formula to use when finding the area of a rectangle? • How can you change kilograms to grams? **MAFS.K12.MP.4.1:** Model with mathematics. • What model can you use to compare customary units of weight or volume? • How can you use a model to compare metric units of length? **MAFS.K12.MP.5.1** Use appropriate tools strategically. • How could estimation help you find the area of a combined shape? • What strategy can you use to determine elapsed time? **MAFS.K12.MP.7.1:** Look for and make use of structure. • When can you use subtraction to find the area of a rectangle? • What rule did you use to find the perimeter of the rectangle?

Big Idea(s)

Measurement

Essential Outcome Question(s)

How can you use relative sizes of measurements to solve problems and to generate measurement tables that show a relationship?

Conceptual Understandings	Essential Question(s)
• Depending on the object, recognize an appropriate unit of measurement. • Understand the relationship between area and perimeter, and be able to use one to find the other with unknown measurements.	• How can you compare metric units of length, mass or liquid volume? • How can you compare customary units of length, weight, or liquid volume? • How are area and perimeter different? • What are some methods you can use to find area and perimeter of a figure? • How can two different rectangles have the same perimeter or the same area?

Aligned Learning Goals		District Adopted Materials	Supplemental Resources	Strategies for Differentiation
Relative Sizes of Measurement Units 10 content + 1 progress monitoring check	Use benchmarks to understand and compare the relative size of customary measurement units of length, weight, and liquid volume *(MD.1.1)*	Go Math! Chapter 12 Achieve the Core Go Math Guidance Documents	• CPALMS: What Time Will It Be?	Reteach & Enrichment Support: Measurement The above document provides opportunities for reteach and enrichment with the current aligned learning goal.
	Use benchmarks to understand and compare the relative size of metric measurement units of length, weight, and liquid volume *(MD.1.1)*			
	Make and interpret line plots using fractional data *(MD.2.4)*			
	Use models to compare units of time and use the strategy *Draw a Diagram* to solve elapsed time problems *(MD.1.2)*			
	Use patterns to write number pairs for measurement units *(MD.1.1)*			

Instructional Strategies and Resources

In Big Idea 8, students will begin with the exploration of the relative sizes of units of measure for length, volume, weight, and mass in both the customary and metric systems. Students will also convert between units of measure within one system and explore the concept of time. Although students are ideally building upon a strong foundation of knowledge of measurement, time should be reserved to give students time to once again to allow for hands-on experience with each unit of measure that they will encounter in their standards. This practice allows students to develop benchmarks for frequently used units of measure; benchmarks help students to develop the meaning of units as well as to make comparisons and estimations with particular units.

As students are working to solve problems regarding a certain unit, they should begin by identifying what attribute of measurement they are considering: length, mass, weight, volume, time, etc. As they then being to measure quantities, it should be understood that measurement is a comparison of this quantity with a certain amount of that quantity, or unit. By creating this understanding, students can begin to see that measurement is a figure of how many units of a particular measure a quantity is composed of.

As students begin to explore the concept of time, it is helpful to define time as just another attribute to be measured. Students need to create a set off benchmarks to help understand the duration of different units of time. For example: 1 hour equals about the length of a class, a half hour equals about the length of a TV program, 1 minute equals the length of time it takes to unpack your backpack. These benchmarks helps students to estimate and check their answers for reasonableness. Teachers can help to build students' comfort/awareness with time by referring to it throughout the day, for example: how long until we go to lunch? How long do you think it will take us to walk to PE? This daily practice with time removes the element of time being such an abstract, intangible concept.

When exploring elapsed time, students need to have a strong understanding of the relationship between hours and minutes. Because this system in still dependent on the base ten system, but increases to the next hour after 60 minutes, students often struggle with calculating elapsed time. Another difficult idea in elapsed time is the concept of two 12 hour cycles in a day. Students should be alerted to these ideas and given ample experience and practice before beginning to calculate elapsed time.

Formative Checkpoint: a continuous process used by teachers and students to utilize formal and informal assessments 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 12 Mid-Chapter Checkpoint
- Chapter 12 Diagnostic Interview
- Math Journal Entries

MFAS Tasks 4.MD.1.1:

- Conversion in the Metric System
- Conversion in the Metric System Part Two
- Conversion in the Customary System
- Converting Units of Time
- Relative Sizes of Measurement Units for Weight
- Relative Sizes of measurement Units for Length

MFAS Tasks 4.MD.1.2:

- Piano Lesson
- Kesha and Juan

MFAS Tasks 4.MD.2.4:

- Race Cars Part One
- Race Cars Part Two
- Science Experiment Part One
- Science Experiment Part Two

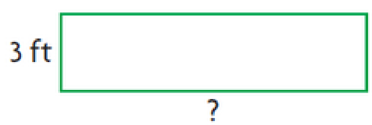
Perimeter and Area 12 days + 1 progress monitoring check	Identify and solve problems that require the use of the perimeter formula *(MD.1.3)*	Go Math! Chapter 13 Achieve the Core Go Math Guidance Documents	• Task Card: Area Farm • Task Card: Spinning Rectangles	Reteach & Enrichment Support: Perimeter and Area The above document provides opportunities for reteach and enrichment with the current aligned learning goal.
	Identify and solve real-world problems involving area using the formulas *(MD.1.3)*			
	Given perimeter or area, find the unknown measure of a side of a rectangle *(MD.1.3)*			

Instructional Strategies and Resources

The second half of Big Idea 8 involves the concepts of perimeter and area. Students come to fourth grade with a basic knowledge of how to calculate each of these measurements, but they have not yet reached a level of deep conceptual understanding. In fourth grade, student will further explore these concepts and take their understanding to a much greater level.

When exploring perimeter and area, students often confuse the concepts because they have not yet formed a solid understanding of what each means. Students must be helped to understand that perimeter is a linear measure measurement and therefore will be represented with a one-dimensional unit, for example 22 ft. On the other hand, area is a measure of two-dimensional space and should be represented in square units. Students must achieve a deeper understanding of the relationship between these two concepts and be able to use one to find the other in situations with unknown measurements.

Example: *The area of a rectangle is 30 feet. The width of the rectangle is 3 feet. Use the information that you know to determine the length of the missing side and the perimeter of the rectangle.*



Area = length x width
30 = length x 3
length = 10 feet

Perimeter equals the sum of all sides or twice the length plus twice the width.

Perimeter = 3 + 3 + 10 + 10 <u>*or*</u> *Perimeter = (2 x 3) + (2 x 10)*
Perimeter = 6 + 20 = 26 feet

While students are expected to use formulas to calculate perimeter and area of rectangles, they need to understand and be able to communicate their understanding of why the formulas work.

Children's Literature:
Spaghetti and Meatballs for All, by Marilyn Burns

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal assessments 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 13 Mid-Chapter Checkpoint
- Chapter 13 Diagnostic Interview
- Math Journal Entries

MFAS Task 4.MD.1.3:

- Fencing a Garden
- What Is the Perimeter of the Lettuce Section?
- Applying Area and Perimeter
- Using Areas and Perimeter

Sample: Suggested Standards-based Check – Blueprint

- Units of Measurement; Scoring Rubric
- Perimeter and Area; Scoring Rubric

Big Idea 9: Mastery of Grade Four
Quarter 4

Academic Plan
Mathematics – Grade Four (Course #5012060)

Adopted Instructional Materials: Houghton Mifflin Harcourt, Go Math!

Big Idea Description: *Mastery of Grade Four*

Before beginning material in Mastery of Grade Four, please make sure all Big Ideas prior have been completed, this includes all Summative Assessments.

In Quarter 4, instructional time should focus on mastery of the three critical areas for Fourth Grade:

1. Developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends.
2. Developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers.
3. Understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

Teachers are encouraged to use Mastery of Grade Four in one of two ways.

Option 1. Select the Critical Area that your students' data shows that they need more time or support with. The data to be reviewed should include, but isn't limited to: summative assessment data, Formative Checkpoint data, CCE data, and classroom observation.

- a. Utilize Model Eliciting Activities (MEAs)[1] to support the instruction in those areas that the students need more support with.
  - i. 2 MEAs take approximately one week to complete.
- b. Utilize task cards, reteach/enrich documents, along with any additional materials from Go Math! to support instruction.
- c. Use Formative Checkpoints (MFAS Tasks or Performance Tasks) to assess progress of student mastery within the Critical Area or to support instruction.
- d. Once students show mastery within a Critical Area move to another Critical Area based upon data in option 1.

Option 2. Instruct within each Critical Area.

- a. Choose 2-3 MEAs to complete with students. Please note in Critical Area 2 there are only 3 MEAs aligned to the Critical Area standards.
  - i. 2 MEAs take approximately one week to complete.
  - ii. Critical Area 3 doesn't contain any MEAs. Please select one of the recommended projects or use another project based learning activity.
- b. Utilize task cards, reteach/enrich documents, along with any additional materials from Go Math! to support instruction.
- c. Spending instructional time in each Critical Area will ensure that all Critical Areas have been reviewed and revisited prior to the end of the school year.

[1]**Model Eliciting Activities (MEAs):** MEAs are open ended, interdisciplinary problem-solving activities that are meant to reveal students' thinking about the concepts embedded in the realistic activities.

Teacher Note: During this time of year, it is vital for fourth grade students to master addition and subtraction within a million. It is our recommendation to continue with daily fluency instruction to help students become fluent with addition and subtraction within a million.

Critical Area 1

Developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends.

Math Content Standards	MEA Cross Content Standards
MAFS.4.OA.1.1: Interpret a multiplication equation as a comparison. **MAFS.4.OA.1.2**: Multiply or divide to solve word problems involving multiplicative comparison. **MAFS.4.OA.1.3**: Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. **MAFS.4.NBT.2.5**: Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations.	**LAFS.4.L.1.2** **SS.4.C.2.2** **LAFS.4.W.1.1** **LAFS.4.W.2.4** **LAFS.4.SL.1.1** Standards for Mathematical Practice **MAFS.K12.MP.1.1**: Make sense of problems and persevere in solving them. **MAFS.K12.MP.2.1**: Reason abstractly and quantitatively. **MAFS.K12.MP.3.1**: Construct viable arguments and critique the reasoning of others. **MAFS.K12.MP.4.1**: Model with mathematics. **MAFS.K12.MP.5.1**: Use appropriate tools strategically. **MAFS.K12.MP.6.1**: Attend to precision. **MAFS.K12.MP.7.1**: Look for and make use of structure. **MAFS.K12.MP.8.1**: Look for and express regularity in repeated reasoning.

MEAs	District Adopted Materials	Supplemental Resources	Strategies for Differentiation
Party Planners Wanted **OA.1.2, OA.1.3** In this MEA, students will work in collaborative groups to solve multistep problems with whole numbers and decimals by using different mathematical operations such as addition, subtraction, multiplication and division. The students will be asked to assist a businessman who is planning a party for his employees. They will need to read several ads and decide which company offers the best deal in renting tables, chairs, and tablecloths for the client. They will need to take into consideration the amount of guests attending the party and the budget allowed. A twist is added to the problem when the students are asked to consider an additional ad and the fact that the guest list is now slightly larger.	Go Math! Chapters 2-4 Big Idea 2 Big Idea 3	• Task Card: Perimeter Patterns • Task Card: Multiplication Blueprint	• Reteach & Enrichment Support: Multiply by 1-Digit Numbers • Reteach & Enrichment Support: Multiply by 2-Digit Numbers • Reteach & Enrichment Support: Divide by One-Digit Numbers The above documents provide opportunities for reteach and enrichment for Mastery of Grade four.

Park Planning **OA.1.3:** Students will be asked to plan a playground using no more than 30% of a park's area. They will analyze the best use of playground equipment using a data chart of area requirements, and making selections based on the least area used for the most amount of equipment (without exceeding 30% of total area of park).			
New Coat of Paint **OA.1.2, =OA.1.3:** In this MEA, students will work in collaborative groups to solve multistep problems with whole numbers and decimals by using different mathematical operations such as addition, subtraction, multiplication and division. The students will be asked to assist a property owner, who is planning to repair his new property, in purchasing the right exterior paint. They will need to read a data table, rank the paints from highest to lowest, calculate the amount of gallons needed according to the surface area, and the total cost of each paint. A twist is added to the problem when one of the paints is not available but two others are added, and also the owner wants to paint the dividing walls outside.			
Loaning Out Laptops **NBT.2.5:** This engaging MEA introduces students to a company named "Loaning Out Laptops" that needs their help in choosing the best laptops for students to do their schoolwork.			
Hotels: Where to Stay **NBT.2.5, OA.1.2:** This MEA allows students to explore the creation of a model to rank hotels. Students are presented with the first part of the problem and the data which includes cost, meals served, pet friendly, and closeness to highway. They will determine which hotel will receive their highest recommendation. The second part of the task adds two hotels and additional data related to discounts. Students need to apply and test their model and make modifications as needed. All findings are submitted to the client in writing. Students may use this information to plan a family vacation researching which hotels they might stay in as they travel.			

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal assessments 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 2 Performance Task: Cars, Trains, Boats and Planes TE; Cars, Trains, Boats and Planes Task
- Chapter 3 Performance Task: Helping Hands TE; Helping Hands Task
- Chapter 4 Performance Task: Visiting New York City TE; Visiting New York City Task

Critical Area 2	
Developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers.	
Math Content Standards	Cross Content Standards
MAFS.4.NF.1.1: Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. **MAFS.4.NF.1.2:** Compare two fractions with different numerators and different denominators. **MAFS.4.NF.2.3:** Understand a fraction a/b with a > 1 as a sum of fractions 1/b. **MAFS.4.NF.2.4:** Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.	**LAFS.4.W.1.1** **LAFS.4.W.2.4** **LAFS.4.SL.1.1** Suggested Standards for Mathematical Practice **MAFS.K12.MP.1.1:** Make sense of problems and persevere in solving them. **MAFS.K12.MP.2.1:** Reason abstractly and quantitatively. **MAFS.K12.MP.3.1:** Construct viable arguments and critique the reasoning of others. **MAFS.K12.MP.4.1:** Model with mathematics. **MAFS.K12.MP.5.1:** Use appropriate tools strategically. **MAFS.K12.MP.6.1:** Attend to precision. **MAFS.K12.MP.7.1:** Look for and make use of structure. **MAFS.K12.MP.8.1:** Look for and express regularity in repeated reasoning.

MEAs	District Adopted Materials	Supplemental Resources	Strategies for Differentiation
Comparing Fractions with Cupcakes **NF.1.2:** In this MEA, students will compare fractions with different denominators to decide which cupcake a bakery should add to their menu. Party Entertainment **NF.1.2, NBT.2.5 (Critical Area 1**): In this MEA, students will decide which entertainer an owner of an entertainment company should hire. They will base their decisions on information provided on resumes. Students will calculate the cost of hiring the entertainer (multiplication of whole numbers) as well as compare the statistics of their talent competitions and attendance turn-out (comparing fractions). Students will write letters to the owner of the entertainment company ranking the entertainers and providing explanation and justification of their strategy for doing so. Birthday Balloon Planner **NF.2.4, OA.1.3 (Critical Area 1):** Students will develop a model for choosing a balloon party planner and rank them from best to worst. The students will be able to use prior knowledge of addition of multi-digit whole numbers, multiplication and division facts and concepts, math calculations with money and time, understanding fractions, and problem solving skills to solve a non-routine MEA (Model Eliciting Activity) that requires real-world application of mathematical skills.	Go Math! Chapters 6-8 Big Idea 5	• Task Card: Fraction Pizza • Task Card: Fraction Tree • Task Card: Fraction War	• Reteach & Enrichment Support: Fraction Equivalence and Comparisons • Reteach & Enrichment Support: Addition of Fractions • Reteach & Enrichment Support: Multiply Fractions by Whole Numbers The above documents provide opportunities for reteach and enrichment for Mastery of Grade four.

Formative Checkpoint: A continuous process used by teachers and students to utilize formal and informal assessments 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 6 Performance Task: Have a Seat TE; Have Seat Task • Chapter 7 Performance Task: Lend a Hand TE; Lend a Hand Task • Chapter 8 Performance Task: Dollar Days TE; Dollar Days Task

Critical Area 3

Understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

Math Content Standards	Cross Content Standards
MAFS.4.G.1.1: Draw points, lines, line segments, rays, angles and perpendicular and parallel lines. **MAFS.4.G.1.2:** Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles. **MAFS.4.G.1.3:** Recognize a line of symmetry for a two-dimensional figure as a line across the figure. **MAFS.4.OA.3.5:** Generate a number or shape pattern that follows a given rule. **MAFS.4.MD.3.5:** Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: **MAFS.4.MD.3.6:** Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. **MAFS.4.MD.3.7:** Recognize angle measure as additive. Solve addition and subtraction problems to find unknown angles.	**LAFS.4.L.1.2** **S.S.4.G.1.4** **LAFS.4.W.2.4** Suggested Standards for Mathematical Practice **MAFS.K12.MP.1.1:** Make sense of problems and persevere in solving them. **MAFS.K12.MP.2.1:** Reason abstractly and quantitatively. **MAFS.K12.MP.3.1:** Construct viable arguments and critique the reasoning of others. **MAFS.K12.MP.4.1:** Model with mathematics. **MAFS.K12.MP.5.1:** Use appropriate tools strategically. **MAFS.K12.MP.6.1:** Attend to precision. **MAFS.K12.MP.7.1:** Look for and make use of structure. **MAFS.K12.MP.8.1:** Look for and express regularity in repeated reasoning.

Project Based Learning	District Adopted Materials	Supplemental Resources	Strategies for Differentiation
Go Math! Critical Area Review Project SE: Creating Cars Go Math! Critical Area Review Project TE: Creating Cars **G.1.2, G.1.3:** Students connect the understanding of area of rectangles to the study of car designs. They will use models and drawings to help them design cars. Students will analyze and classify geometric figures based on their properties. Critical Area Review Project: Angles, Lines and Triangles, Oh My! **MD.3.5, MD.3.6** Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. Students will design a map of a town, neighborhood, park or other, using lines, angles and triangles.	Go Math! Chapters 10 & 11 Big Idea 7	• Task Card: Zoo Angles	• Reteach & Enrichment Support: Two-Dimensional Figures • Reteach & Enrichment Support: Angles The above document provides opportunities for reteach and enrichment for Mastery of Grade Four.

Formative Checkpoint: Formative Checkpoint is a continuous process used by teachers and students to utilize formal and informal assessments 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 10 Performance Task: Quilting Bee TE; Quilting Bee Task
- Chapter 11 Performance Task: Klee Kat TE; Klee Kat Task