Mathematics Department

Grade 3

Developed By: Leann Martin & Grade 3 Teachers

Effective Date: Fall 2020

Scope and Sequence

Month	Grade 3
September	Grade 3 Math Baseline Assessment (by September 14) **Chapter 1: Numbers to 10,000** *Math in Focus* Chapter 1 Test Prep: Numbers to 1,000 ***This assessment contains above grade level questions that can be used to identify Level 4 student performance.*** **Chapters 3 & 4: Addition & Subtraction Review** **Grade 3 Standard: Students must be able to add and subtract fluently within 1,000 using strategies involving place value, properties of operations, and teh relationship between addition and subtraction**
October	**Skip Chapter 2: Mental Math and Estimation (except for Lesson 4)** **First-Go Back to Grade 2 Chapter 10 Lesson 5 (10.5) Rounding Numbers to Estimate** **Grade 3 Chapter 2 Lesson 4 (2.4) Rounding Numbers to Estimate** *Review Balanced Equations Regularly **Chapter 6: Multiplication Tables of 6,7,8, and 9** **For differentiation purposes- Pull resources from Grade 2 Chapters 6 and 15 (Multiplication Tables of 2, 5, 10, 3, 4)**
November	**Chapter 19: Area (Lessons 19.1 to 19.3 ONLY)- Book B** ***Infuse Area when teaching multiplication and arrays- Use Chapter 19** **Grade 3 Benchmark Assessment 1 (by November 30) (Chapters 1, 3, 4, 5, 6, 19-Area only)**
December	**Chapter 7 (Lesson 7.1 only): Mental Multiplication** **Chapter 8 (Lesson 8.1 only) Mental Division** **Chapter 5: Using Bar Models: Addition & Subtraction** *Math in Focus* Chapter 5 Test Prep: Using Bar Models Addition & Subtraction **First- Go Back to- Grade 2 Chapter 16: Using Bar Models: Multiplication and Division (Lessons**

	16.1 and 16.2 ONLY) **Then- Chapter 9 Using Bar Models: Multiplication and Division (*9.1 through 9.4, but only include problems involving multiplication and division within 100- similar to the problems in 7.1 and 8.1)** **Focus Lesson: 9.4a Real-World Problems: Two-Step Problems (After Lesson 4) (3.OA.8) TEA 266A**
January	**Finish 7,8,9 (See specifics above.)** **Chapter 14: Fractions - Book B All Lessons (14.1 to 14.6)** **Focus Lesson: 14.6.a Fractions (After Lesson 6) (3.NF.3c- Writing whole numbers as fractions) TEB 390A** **Chapter 15: Customary Length- Just Customary (Lesson 15.1 Only)** **Then Focus Lesson: 15.1a Measuring Length in Quarter Inches and Displaying on a line plot (3.MD.4) TEB 390B** *Major Focus: Fractions on a Ruler
February	**Grade 3 Benchmark Assessment 2 (by February break) (Chapters 7, 8, 9, 14, 15 as described above) Add 5????** **Chapter 13: Bar Graphs and Line Plots** (Tie in Using Line Plots in Surveys 11.3) **Chapter 17 Angles and Lines (all lessons- Students need to understand parallel and perpendicular in order to classify quadrilaterals by angles and sides (in Ch 18-p. 312)** **Chapter 18 (Lesson 18.1 Only) Two-Dimensional Shapes** ***Emphasize Categorization of Quadrilaterals (p. 312- Venn Diagram)** **Chapter 19: (Perimeter -19.4 & 19.5 -and Area Review** **Focus Lesson: 19.4a Real-World Problems: Area (3.MD.7.b and 3.MD.7.d TEB 390E)**
March	**First Go Back to Grade 2 Chapter 8: Mass (3.MD.2)** **and Grade 2 Chapter 9: Volume (3.MD.2)** *Can Use: Math in Focus* Grade 2 Chapter 8 Test Prep: Mass *Can Use: Math in Focus* Grade 2 Chapter 9 Test Prep: Volume **Chapter 11: Metric Length, Mass and Volume** **Chapter 12: Real World Problems: Measurement** ***Modify problems in Chapter 12 so that all numbers are single digit numbers or multiples of 10. (See Numbers used in Lessons 7.1 and 8.1.)** **Chapter 16: Time only (16.1 to 16.5)- Look at conversions**
April	**Grade 3 Benchmark Assessment 3 (by April 12-Optional) (Chapters 11, 12, 13, 16, 19**

May	Customary? Measurement Grade 3 Math Spring Summative Assessment by May 31 (will assess all Grade 3 Standards up to this point)
June	**Go back and finish Chapters 7, 8, and 9** (Multiplication Algorithm , Long Division Algorithm; Word Problems)

Unit 1

Numbers to 10,000

Summary and Rationale

This unit is designed to cement a student's understanding of place value. Students have learned how to count, read and write numbers up to 1,000 in Grade 2. Students will learn how to read and write numbers up to 10,000.
Given a multi-digit number, students will identify the place value of each digit in the number and express the number in standard, word, and expanded forms. Students will compare and verbally describe sets of numbers using the terms *least* and *greatest*. Using these skills, they will write numbers in increasing or decreasing order. Students will also apply the number and place value concepts to identify and complete number patterns and find missing numbers on a number line.

An important application of place value and number sense is rounding. The number line can be used a visual representation that illustrates the rounding concept. Students will learn to round to the nearest ten and hundred. They will also use rounding to estimate sums and differences and check reasonableness of answers.

In Grade 2, students used base-ten blocks, place-value charts, vertical form, and the part-whole concept to add and subtract numbers up to 1,000 with and without regrouping. Students will rename, add, and subtract greater numbers and understand addition and subtraction as they relate to place value. The emphasis is on building procedural knowledge with deep understanding. The inverse relationship between addition and subtraction is revisited as students are reminded to check answers to subtraction using addition. Fluency is expected only within 1,000.

Students will use bar models to represent a problem using a visual model to solve multi-step addition and subtraction problems.

Recommended Pacing

Chapter 1, Numbers to 10,000 - 3 weeks
Chapter 3, Addition up to 10,000 - 1 week
Chapter 4, Subtraction up to 10,000 - 2 weeks
Chapter 5, Using Bar Models: Addition and Subtraction - 2 weeks

Standards

Numbers & Operations in Base Ten	
3.NBT.1	Use place value understanding to round whole numbers to the nearest 10 or 100.
3.NBT.2	Fluently add and subtract within 1,000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
Operations & Algebraic Thinking	
3.OA.8	Solve two-step word problems using the four operations. 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.
3.OA.9	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*
Mathematical Practices	
K-12.MP.1	Make sense of problems and persevere in solving them.
K-12.MP.2	Reason abstractly and quantitatively.
K-12.MP3	Construct viable arguments and critique the reasoning of others.
K-12.MP.4	Model with mathematics.
K-12.MP.5	Use appropriate tools strategically.
K-12.MP.6	Attend to precision.
K-12.MP.7	Look for and make use of structure.
K-12.MP.8	Look for and express regularity in repeated reasoning.
Interdisciplinary Connections	
Standard x.x	
Integration of Technology	
Instructional Focus	

Enduring Understandings:	**Essential Questions:**
Numbers to 10,000 can be counted and compared. Estimation strategies can be used to find and check sums and differences. Greater numbers can be added the same way two-digit numbers are added, with or without regrouping. Greater numbers can be subtracted with or without regrouping. Addition and subtraction bar models can be used to solve two-step real-world problems.	How do we add greater numbers? How do we subtract greater numbers? Ho can bar models help solve real-world addition and subtraction problems?
Evidence of Learning (Assessments)	
Objectives (SLO)	
Student will know: ● Word form, standard form, expanded form ● Digit, place-value chart, place-value strips ● Greater than, less than, least, greatest ● Rule ● Number line ● Round ● Estimate ● About ● Nearest ten ● Reasonable ● Overestimate ● Regroup ● Sum, difference	Student will be able to: ● Use base-ten blocks and a place-value chart to count, read, write, and represent numbers to 10,000. ● Count by 1s, 10s, 100s, and 1,000s to 10,000. ● Read and write numbers to 10,000 in standard form, expanded form, and word form. ● Use base-ten blocks and place value to compare and order numbers. ● Use a number line to round numbers to the nearest ten or hundred. ● Use rounding to estimate sums and differences. ● Estimate to check reasonableness of answers. ● Add two-digit numbers mentally with and without regrouping. ● Subtract two-digit numbers mentally with and without regrouping. ● Use different strategies to add two-digit numbers close to 100 mentally. ● Round numbers to estimate sums and differences. ● Add greater numbers with and without regrouping. ● Use base-ten blocks to subtract with and without regrouping. ● Use base-ten blocks to subtract across zeros.

	• Write subtraction number sentences. • Solve subtraction word problems. • Use bar models to solve two-step real-world problems involving addition and subtraction. . .

Suggested Resources/Technology Tools

Math in Focus Grade 3 Chapter 1: Numbers to 10,000.
Math in Focus Grade 2 Chapter 10: Mental Math and Estimation, (Lesson 10.5 ONLY) Rounding Numbers to Estimate
Math in Focus Grade 3 Chapter 2: Mental Math and Estimation (Lesson 2.4 ONLY) Rounding Numbers to Estimate
Math in Focus Grade 3 Chapter 3: Addition Up to 10,000
Math in Focus Grade 3 Chapter 4: Subtraction Up to 10,000
Math in Focus Grade 3 Chapter 5: Using Bar Models: Addition and Subtraction

Resources and Manipulatives
Base-ten blocks
Place-value chart
Place-value strips
Place-value mat
Number cards
Number cubes

Online Resources
www.k6-thinkcental.com
Math in Focus Virtual Manipulatives
Math in Focus Student Interactives
https://www.ixl.com/math/grade-3 Grade 3 Concepts by Topic
https://www.splashmath.com/number-games-for-3rd-graders Number Games
https://www.splashmath.com/place-value-games-for-3rd-graders Place Value Games
http://www.abcya.com/base_ten.htm Base Ten Blocks
http://www.abcya.com/rounding_numbers.htm Rounding Game
https://jr.brainpop.com/math/numbersense/rounding/ Rounding Video

Modifications

*These are only suggested ideas to modify instruction, modifications and accommodations should be tailored to each student's IEP and needs. Also, see textbook for Differentiated Instruction ideas in each chapter.

Special Education - Reteach/Extra practice workbook pages, anchor charts, scaffolded explanations of topics, manipulatives, additional time for work, group work, visual aids, modeling, hands-on learning activities, small group work for more individualized attention

504 - Reteach/Extra practice pages, anchor charts, scaffolded explanations of topics, manipulatives, extra time for work, group work, visual aids, modeling, hands-on learning activities, small group work for more individualized attention

ELL - Select activities which reinforce chapter vocabulary and connections among these words such as:
A Word Wall which includes terms, definitions, and examples
Drawings and numbers to show examples of terms

Gifted and Talented - Enrichment workbook, Put on Your Thinking Cap pages and resources, higher-level questions, challenge packets, KenKen and other puzzles, leading group work

21ST CENTURY LIFE AND CAREER STANDARDS

Please select all standards that apply to this unit of study:

- ❑ Act as a responsible and contributing citizen and employee.
- ❑ Apply appropriate academic and technical skills.
- ❑ Attend to personal health and financial well being.
- ❑ Communicate clearly and effectively and with reason.
- ❑ Consider the environmental social and economics impacts of decisions.
- ❑ Demonstrate creativity and innovation.
- ❑ Employ valid and reliable research strategies.
- ❑ Utilize critical thinking to make sense of problems and persevere in solving them.
- ❑ Model integrity, ethical leadership, and effective management.
- ❑ Plan education and career paths aligned to personal goals.
- ❑ Use technology to enhance productivity.
- ❑ Work productively in teams while using cultural global competence.

Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS:

Unit 2

Multiplication & Division

Summary and Rationale

Both multiplication and division are associated with the part-whole concept. In this unit, students multiply using different models such as number lines, dot paper, and area models. These use skip-counting to multiply mentally and base-ten blocks and place-value charts to multiply greater numbers with and without regrouping.

Division concepts are extended to division situations where there may be remainders. Students are made aware that the dividend does not always divide exactly into equal groups, but sometimes leaves a remainder. Students learn the steps of vertical division (long division) to divide with or without regrouping or a remainder.

The conceptual skills between multiplication and division are strengthened. Students use related multiplication facts to divide. They apply the inverse relationship of multiplication and division to write division statements from

multiplication sentences.

Bar models are used to solve different kinds of multiplication and division word problems. Drawing bar models provides students with a systematic means of organizing information and determining the calculations needed to solve the problem. Bar models simplify the problems by showing clearly what steps need to be taken to answer the question.

Recommended Pacing

Chapter 6, Multiplication Tables of 6, 7, 8, and 9 - 4 weeks
Chapter 7, Multiplication - 2 weeks (Include area when teaching multiplication)
Chapters 8, Division, 1 week (Lesson 8.1 only)
Chapter 9, Using Bar Models: Multiplication and Division
Focus Lesson: 9.4a Real-World Problems: Two-Step Problems TE 266A

Standards

Numbers & Operations in Base Ten	
3.NBT.3	Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 x 80, 5 x 60) using strategies based on place value and properties of operations.
Operations & Algebraic Thinking	
3.OA.1	Interpret products of whole numbers, e.g. interpret 5x7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 x 7.*
3.OA.2	Interpret whole- number quotients of whole numbers, e.g. interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equals shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.*
3.OA.3	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g. by using drawings and equations with a symbol for the unknown number to represent the problem.
3.OA.4	Determine the unknown number in a division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 x ? = 48, 5 = ? ÷ 3, 6 x 6 = ?*
3.OA.5	Apply properties of operations as strategies to multiply and divide. *Examples: If 6 x 4 = 24 is known, then 4 x 6 = 24 is also known. (Commutative property of multiplication.) 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30. (Associative property of multiplication.) Knowing that 8 x 5 = 40 and 8 x 2 = 16, one can find 8 x 7 as 8 x (5 + 2) = (8 x 5) + (8 x 2) = 40 + 16 = 56. (Distributive property.)*
3.OA.6	Understand division as an unknown- factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*

3.OA.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.
3.OA.8	Solve two-step word problems using the four operations. 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.
3.OA.9	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*
Measurement & Data	
3.MD.5	Recognize area as an attribute of plane figures and understand concepts of area measurement.
3.MD.5a	Recognize that a square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.
3.MD.5b	Recognize that a plane figure which can be covered without gaps or overlaps by *n* unit square is said to have an area of *n* square units.
3.MD.6	Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units.
3.MD.7	Relate area to the operations of multiplication and addition.
3.MD.7a	Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
3.MD.7b	Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
3.MD.7c	Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths *a* and *b + c* is the sum of *a x b* and *a x c*. Use area models to represent the distributive property in mathematical reasoning.
3.MD.7d	Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.
Mathematical Practices	
K-12.MP.1	Make sense of problems and persevere in solving them.
K-12.MP.2	Reason abstractly and quantitatively.
K-12.MP3	Construct viable arguments and critique the reasoning of others.
K-12.MP.4	Model with mathematics.

K-12.MP.5	Use appropriate tools strategically.
K-12.MP.6	Attend to precision.
K-12.MP.8	Look for and express regularity in repeated reasoning.
Interdisciplinary Connections	
Standard x.x	
Integration of Technology	

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Multiplication and division use equal groups. Multiplication is repeated addition and division is repeated subtraction. Array models, area models and mental math can be used to multiply. The area is the amount of space which a rectangle takes up. The answer to a multiplication problem is called the product. Division is the process of sharing or grouping. The answer to a division problem is called the quotient. In sharing, the total amount (the dividend) is divided by the number of equal groups (the divisor) to find the number of items in each group. In grouping, the total amount (the dividend) is divided by the number of items in each group (the divisor) to find the number of equal groups.	What strategies can be used to multiply and divide? How are multiplication and area of rectangles related? How do multiplication facts help you divide? How are multiplication and division related? How do bar models help solve multiplications and division word problems?

Using related multiplication facts can help to divide mentally because multiplication and division are opposite operations. Bar models can be used to solve different kinds of multiplication and division real-world problems.	
Evidence of Learning (Assessments)	
Objectives (SLO)	
Students will know or learn: ● Times ● Equal groups ● Skip-count ● Multiply ● Repeated Addition ● Multiplication sentence, multiplication story ● Related multiplication facts ● Array model ● Area model ● Area ● Square units: square centimeter (cm^2), square inch (in^2), square meter (m^2), square foot (ft^2) ● Share ● Divide ● Repeated Subtraction ● Division sentence, division story ● Dot paper ● Number line ● Commutative Property ● Associative Property ● Multiplication Property of One ● Multiplication Property of Zero ● Factor ● Product ● Dividend ● Divisor ● Quotient	Student will be able to: ● Review and practice multiplication facts of 2,3,4,5,10. ● Use multiplication properties. ● Understand multiplication by using array models. ● Practice multiplication facts of 6. ● Understand multiplication by using area models. ● Practice multiplication facts of 7. ● Understand multiplication by using number lines. ● Practice multiplication facts of 8. ● Practice multiplication facts of 9. ● Use square units to find the area of plane figures made of squares and half squares. ● Compare areas of plane figures and make plane figures of the same area. ● Use square centimeter and square inch to find and compare the area of figures. ● Use square meters and square feet to find and compare the area of plane figures. ● Divide to find the number of items in each group. ● Identify related multiplication and division facts. ● Write and express division sentences for real-world problems. ● Divide to find the number of groups. ● Multiply ones, tens, and hundreds mentally. ● Use related multiplication facts to divide. ● Use patterns to divide multiples of 10 and 100. ● Use bar models to solve real world multiplication and division problems. ● Write multiplication and division sentences to solve real word problems. ● Choose the correct operations in two-step word problems.

	• Solve two-step word problems using the four operations. • Represent unknown quantities with letters.

Suggested Resources/Technology Tools

Math In Focus Grade 3 Chapter 6: Multiplication of 6,7,8, and 9
Math In Focus Grade 3 Chapter 19: Area (Lessons 19.1 to 19.3 ONLY)
Math In Focus Grade 3 Chapter 7: Multiplication (Lesson 7.1 ONLY): Mental Multiplication
Math In Focus Grade 3 Chapter 8: Division (Lesson 8.1 ONLY): Mental Division
Math In Focus Grade 2 Chapter 16: Using Bar Models: Multiplication and Division (Lessons 16.1 and 16.2 ONLY)
Math In Focus Grade 3 Chapter 9: Using Bar Models: Multiplication and Division * Use numbers within 100-similar to those in 7.1 and 8.1)
Focus Lesson 9.4a Real World Problems: Two-Step Problems

Resources and Manipulatives
Number lines
Dot paper
Counters
Connecting cubes
Number cubes
Number train
Number cards
Area models
Square grid paper
Geoboards
Square tiles
Half-square tiles
Multiplier cards
Number board
Question cards
Base-ten blocks
Place-value mat
Game cards
Paper strips
Multiplication/division flashcards

Online Resources
www.k6-thinkcental.com
Math in Focus Virtual Manipulatives
Math in Focus Student Interactives
https://www.ixl.com/math/grade-3 Grade 3 Concepts by Topic
https://www.splashmath.com/multiplication-games-for-3rd-graders Multiplication Games
https://www.splashmath.com/division-games-for-3rd-graders Division Games
http://www.abcya.com/multiplication_mine.htm Multiplication Mine Game
http://www.abcya.com/math_facts_game.htm Math Facts Game

https://jr.brainpop.com/math/multiplicationanddivision/arrays/ Arrays Video
https://jr.brainpop.com/math/multiplicationanddivision/repeatedaddition/ Repeated Addition Video
https://jr.brainpop.com/math/multiplicationanddivision/repeatedsubtraction/ Repeated Subtraction Video
https://jr.brainpop.com/math/multiplicationanddivision/multiplyingby0or1/ Multiplying by 0 or 1 Video

Modifications

*These are only suggested ideas to modify instruction, modifications and accommodations should be tailored to each student's IEP and needs. Also, see textbook for Differentiated Instruction ideas in each chapter.

Special Education - Reteach/Extra practice pages, anchor charts, scaffolded explanations of topics, manipulatives, extra time for work, group work, visual aids, modeling, hands-on learning activities, small group work for more individualized attention

504 - Reteach/Extra practice pages, anchor charts, scaffolded explanations of topics, manipulatives, extra time for work, group work, visual aids, modeling, hands-on learning activities, small group work for more individualized attention

ELL - Select activities which reinforce chapter vocabulary and connections among these words such as:
A Word Wall which includes terms, definitions, and examples
Drawings and numbers to show examples of terms

Gifted and Talented - Enrichment book, Put on Your Thinking Cap pages and resources, higher-level questions, challenge packets, KenKen and other puzzles, leading group work

Please select all standards that apply to this unit of study:

- ❑ Act as a responsible and contributing citizen and employee.
- ❑ Apply appropriate academic and technical skills.
- ❑ Attend to personal health and financial well being.
- ❑ Communicate clearly and effectively and with reason.
- ❑ Consider the environmental social and economics impacts of decisions.
- ❑ Demonstrate creativity and innovation.
- ❑ Employ valid and reliable research strategies.
- ❑ Utilize critical thinking to make sense of problems and persevere in solving them.
- ❑ Model integrity, ethical leadership, and effective management.
- ❑ Plan education and career paths aligned to personal goals.
- ❑ Use technology to enhance productivity.
- ❑ Work productively in teams while using cultural global competence.

Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS:

Unit 3

Fractions

Summary and Rationale

In this unit, students begin to work with fractions of wholes that are divided into more than four equal parts. Students learn concepts such as equivalent fractions and identifying fractions of a set. Through this unit, students develop an understanding of the meanings and uses of fractions, such as representing parts of a whole, parts of a set, and points or distances on a number line.

Working with wholes that are divided into more than four equal parts, students use a variety of skills to find equivalent fractions, compare fractions, and order fractions. They use models to add and subtract like fractions.

In this unit, students measure length using customary units. With the exposure to real-world problems, students are able to make sense of what they learn in parallel context situations encountered in everyday life. Line plots are also introduced for the first time.

Recommended Pacing

Chapter 14, Fractions - 4 weeks
Chapter 15, Measuring Length - 1 week (Lesson 15.1 only)
Chapter 13 Lesson 13.3 ONLY and Focus Lesson 15.1a

Standards

Numbers & Operations - Fractions	
3.NF.1	Understand a fraction *1/b* as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; understand a fraction *a/b* as the quantity formed by a parts of size *1/b*.
3.NF.2	Understand a fraction as a number on the number line; represent fractions on a number line diagram.
3.NF.2a	Represent a fraction *1/b* on a number line diagram by defining the interval 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size *1/b* and that the endpoint of the part based at 0 locates the number *1/b* on the number line.
3.NF.2b	Represent a fraction *a/b* on a number line diagram by marking off a lengths of *1/b* from 0. Recognize that the resulting interval has size *a/b* and that its endpoint locates the number *a/b* on the number line.
3.NF.3	Explain equivalence of fractions in special cases and compare fractions by reasoning about their size.
3.NF.3a	Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
3.NF.3b	Recognize and generate simple equivalent fractions, e.g., ½ = 2/4, 4/6 = 2/3). Explain why the

	fractions are equivalent, e.g., by using a visual fraction model.
3.NF.3c	Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form 3 = 3/1; recognize 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.*
3.NF.3d	Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
Measurement & Data	
3.MD.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units- whole numbers, halves, and quarters.
Geometry	
3.G.2	Partition shapes into equal areas. Express the area of each part as a unit fraction of the whole. *For example, partition a shape into 4 parts with equal area, and describe the area of each part as ¼ of the area of the shape.*
Mathematical Practices	
K-12.MP.1	Make sense of problems and persevere in solving them.
K-12.MP.2	Reason abstractly and quantitatively.
K-12.MP3	Construct viable arguments and critique the reasoning of others.
K-12.MP.4	Model with mathematics.
K-12.MP.5	Use appropriate tools strategically.
K-12.MP.6	Attend to precision.
K-12.MP.7	Look for an make use of structure.
Interdisciplinary Connections	
Standard x.x	
Integration of Technology	

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Fractions can be used to describe parts of a region. Fractions can be used to describe parts of a set. Length can be measured in inches, feet, yards, and miles. A ruler is comparable to a number line that contains fractions. More exact lengths can be measured using fraction of a unit such as quarter-inch, half-inch, or three quarter-inch. Line plots can be used to show data and show how the data is spread out. The horizontal axis of a line plot can be created to include fractions of a unit.	How can fractions be modeled? How are fractional parts compared? What are equivalent fractions? Where are fractions found in the real world? When and how do we measure length?

Evidence of Learning (Assessments)

Objectives (SLO)

Students will know or learn:	Student will be able to:
● Whole ● Equal parts ● Numerator, denominator ● Equivalent fractions ● Number line ● Simplest form ● Benchmark ● Like fractions, unlike fractions ● Inch (in.) ● Half-inch ● Quarter-inch ● Three-quarter inch ● Foot (ft.) ● Yard (yd.) ● Mile (mi.)	● Read, write, and identify fractions from wholes with more than four parts. ● Identify numerator and denominator. ● Use models and a number line to identify equivalent fractions. ● Use multiplications and division to find equivalent fractions. ● Write fractions in simplest form. ● Compare and order fractions using benchmark fractions. ● Show fractions as points or distances on a number line. ● Add two or three fractions with sums to one. ● Subtract a like fraction from another like fraction or one-whole.

• Line plot • Vertical, horizontal • Axis, scale	• Read, write, and identify fractions of a set. • Find the number of items in a fraction of a set. • Express whole numbers as fractions. • Recognize fractions that are equal to whole numbers. • Ues inch, foot, yard, and mile as units of measurement for lengths. • Estimate and measure given lengths. • Use references to measure lengths. • Estimate and measure lengths in halves and fourths of an inch. • Make a line plot to represent and interpret data. • Estimate and show measurements in a line plot with a scale of whole numbers and fractions.

Suggested Resources/Technology Tools

Math In Focus Resources Chapter 14: Fractions
Focus Lesson 14.6a Whole Numbers as Fractions
Math In Focus Resources Chapter 15: Customary Length (Lesson 15.1 ONLY)
Math In Focus Resources Chapter 13:Lesson 13.3 ONLY Line Plots
Focus Lesson 15.1a

Resources and Manipulatives
Connecting cubes
Fraction circle cut-outs
Centimeter square grid paper
Fraction strips
Fraction number lines
Fraction manipulatives
Fraction Bingo

Online Resources
www.k6-thinkcental.com
Math in Focus Virtual Manipulatives
Math in Focus Student Interactivities
https://www.ixl.com/math/grade-3 Grade 3 Concepts by Topic
http://www.abcya.com/fraction_fling.htm Fraction Fling
http://www.abcya.com/equivalent_fractions_bingo.htm Equivalent Fraction Bingo
https://www.splashmath.com/fraction-games-for-3rd-graders Fraction Games
https://jr.brainpop.com/math/fractions/equivalentfractions/ Equivalent Fractions Video
https://jr.brainpop.com/math/fractions/morefractions/ Fractions Video

Modifications

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504 - Reteach/Extra practice pages, anchor charts, scaffolded explanations of topics, manipulatives, extra time for work, group work, visual aids, modeling, hands-on learning activities, small group work for more individualized attention

ELL - Select activities which reinforce chapter vocabulary and connections among these words such as:

A Word Wall which includes terms, definitions, and examples

Drawings and numbers to show examples of terms

Gifted and Talented - Enrichment book, Put on Your Thinking Cap pages and resources, higher-level questions, challenge packets, KenKen and other puzzles, leading group work

Please select all standards that apply to this unit of study:

- ❑ Act as a responsible and contributing citizen and employee.
- ❑ Apply appropriate academic and technical skills.
- ❑ Attend to personal health and financial well being.
- ❑ Communicate clearly and effectively and with reason.
- ❑ Consider the environmental social and economics impacts of decisions.
- ❑ Demonstrate creativity and innovation.
- ❑ Employ valid and reliable research strategies.
- ❑ Utilize critical thinking to make sense of problems and persevere in solving them.
- ❑ Model integrity, ethical leadership, and effective management.
- ❑ Plan education and career paths aligned to personal goals.
- ❑ Use technology to enhance productivity.
- ❑ Work productively in teams while using cultural global competence.

Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS:

Unit 4

Measurement & Data

Summary and Rationale

Mass

Children learn that mass is a concept of measure to describe how heavy an object is. They estimate and measure the mass of objects using the standard metric units of kilograms (kg) and grams (g). Children also read the masses of objects from measuring scales and use a balance to determine, compare, add and subtract the masses of objects.

Volume
Children learn that volume is the amount of liquid in a container. In Singapore Math, there is a distinction made between capacity of container (amount of space in a container) and volume of liquid (amount of liquid in a container). This distinction is not made in this unit because the emphasis here is on the amount of volume of liquids, and not containers. Children compare volumes of liquids in identical and non-identical containers and learn that the metric unit of measure for volume is liters (L). They measure the volume of liquid in a container by using one or more measurement cups. The liquid is poured into the measuring cup(s) to determine its volume, regardless of the capacity of the original container. The volume of liquid in different containers is compared by comparing the number of measuring cups needed to contain all the liquid.

Metric
In this unit, students use metric units of measurement to measure length, mass, and volume. They read tools measuring length, mass, and volume in metric units and also convert between metric units of measurement.
Students use bar models to solve one and two-step real-world problems involving the addition, subtraction, multiplication, division, and metric measurements.

Bar Graphs and a Review of Line Plots
students use bar graphs and line plots to organize data. Bar graphs are used to compare data. Line plots show how data is spread out. Students begin to work with bar graphs that contain scales in skips of two or greater and read and interpret bar graphs to solve real-world problems. Students use these line plots to organize data and show frequency of an event. They relate both graphs and plots to real-life problem situations.

Time
In this unit, students learn about reading and telling time to the minute. They convert time units in hours and minutes, add and subtract time, and use time to find when activities start and end, or how long an activity will last.

Recommended Pacing

Chapter 11, Metric Length, Mass, and Volume - 2 weeks
Chapter 12, Real-World Problems: One Step Problems - 1 week
Chapter 16, Time and Temperature - 2 weeks
Chapter 13, Bar Graphs and Line Plots - 2 weeks

Standards

Measurement & Data	
3.MD.1	Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
3.MD.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (L). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same unit, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

3.MD.3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*
Numbers & Operations- Base Ten	
3.NBT.2	Fluently add and subtract within 1,000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
Operations & Algebraic Thinking	
3.OA.3	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g. by using drawings and equations with a symbol for the unknown number to represent the problem.
3.OA.4	Determine the unknown number in a division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 x ? = 48, 5 = ? ÷ 3, 6 x 6 = ?*
3.OA.5	Apply properties of operations as strategies to multiply and divide. *Examples: If 6 x 4 = 24 is known, then 4 x 6 = 24 is also known. (Commutative property of multiplication.) 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30. (Associative property of multiplication.) Knowing that 8 x 5 = 40 and 8 x 2 = 16, one can find 8 x 7 as 8 x (5 + 2) = (8 x 5) + (8 x 2) = 40 + 16 = 56. (Distributive property.)*
3.OA.6	Understand division as an unknown- factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*
3.OA.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.
Mathematical Practices	
K-12.MP.1	Make sense of problems and persevere in solving them.
K-12.MP.2	Reason abstractly and quantitatively.
K-12.MP3	Construct viable arguments and critique the reasoning of others.
K-12.MP.4	Model with mathematics.
K-12.MP.5	Use appropriate tools strategically.
K-12.MP.6	Attend to precision.
Interdisciplinary Connections	
Standard x.x	

	An Illusionary Tale by Arline Baum and Joseph Baum Math Journal
Integration of Technology	

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Mass is a concept of measure to describe how heavy an object is. A scale can be used to measure and compare masses in kilograms and grams. Volume is the amount of liquid in a container. Liters can be used to measure volume. Standard and non-standard units of measure are used to find measurements. Units of measurement used often depend of the size of an object. Length, mass, and volume can be measured using metric units of measurement. Bar models can be used to solve one and two-step problems on measurements. Bar graphs and line plots help to organize data. Bar graphs are used to compare data. Line plots show how data is spread out. Time is a measurement concept that can be used to tell when activities start and end, or how long an activity will last.	What are some of the tools that can be used to estimate and measure the length of an object? What are some of the tools that can be used to estimate and measure mass? What are some of the tools that can be used to estimate and measure volume? When and how do we measure length? When and how do we measure mass? Weight? When and how do we measure volume? Why do we put data in bar graphs and line plots? How do bar graphs and line plots help us better understand information? What kinds of questions can be answered using line plots and bar graphs? Why is it important to tell time? When is it appropriate to estimate telling time?

Evidence of Learning (Assessments)

Objectives (SLO)

Students will know or learn:

- Meter (m), centimeter (cm), kilometer (km)
- Distance
- Mass
- Measuring scale
- Gram (g), kilogram (kg)
- Volume
- Capacity
- Liter (L), milliliter (mL)
- Vertical, horizontal
- Axis, scale
- Line plot
- Survey
- Hours (h), minutes (min)
- Hour past, minute to

Student will be able to:

- Use meters, centimeters, and kilometers as units of measurement of length.
- Estimate and measure length.
- Convert units of measurement.
- Use a measuring scale to measure mass in kilograms and grams.
- Read scales in kilograms and grams.
- Compare and order masses.
- Estimate and find actual masses of objects using different scales.
- Estimate and find volume of liquid in liters and milliliters.
- Find the volume and capacity of a container.
- Use bar models, addition, and subtraction to solve real-world problems about volume.
- Draw bar models to solve one and two-step measurement problems.
- Choose the operation to solve one and two-step problems.
- Make bar graphs with scales using data in picture graphs and tally charts.
- Read and interpret data from bar graphs.
  Solve problems using bar graphs.
- Make a line plot to represent and interpret data.
- Tell time to the minute.
- Read time on a digital clock.
- Change minutes to hours or hours to minutes.
- Add and subtract time with and without regrouping.
- Solve up to two-step word problem on time.

Suggested Resources/Technology Tools

Math in Focus Grade 2 Chapters 8 (Mass) and 9 (Volume)
Math In Focus Resources Chapter 11: Metric Length, Mass, and Volume
Math In Focus Resources Chapter 12: Real-World Problems: Measurement
*Modify problems in Chapter 12 so that all numbers are single digit numbers or multiples of 10.
Math In Focus Resources Chapter 13: Bar Graphs and Line Plots
Math In Focus Resources Chapter 16: Time (Time Only) Elapsed Time? (Lesson 16.1 to 16.4 ONLY)

Resources and Manipulatives
Measuring tape or meter stick
Centimeter square grid
Measuring scale
Balancing scale
Weighing scale
Metric measuring cups
Bar charts and graphs
Tally charts
Number lines

Online Resources
www.k6-thinkcental.com
Math in Focus Virtual Manipulatives
Math in Focus Student Interactivities
https://www.ixl.com/math/grade-3 Grade 3 Concepts by Topic
http://www.abcya.com/telling_time.htm Telling Time Game
https://www.splashmath.com/time-games-for-3rd-graders Time Games
https://www.splashmath.com/measurement-games-for-3rd-graders Measurement Games
https://jr.brainpop.com/math/measurement/centimetersmeterskilometers/ Metric Length Video
https://jr.brainpop.com/math/measurement/gramsandkilograms/ Grams and Kilograms Video
https://jr.brainpop.com/math/time/timetotheminute/ Time to the Minute Video
https://jr.brainpop.com/math/time/elapsedtime/ Elapsed Time Video

Modifications

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504 - Reteach/Extra practice pages, anchor charts, scaffolded explanations of topics, manipulatives, extra time for work, group work, visual aids, modeling, hands-on learning activities, small group work for more individualized attention

ELL - Select activities which reinforce chapter vocabulary and connections among these words such as:
A Word Wall which includes terms, definitions, and examples
Drawings and numbers to show examples of terms

Gifted and Talented - Enrichment book, Put on Your Thinking Cap pages and resources, higher-level questions, challenge packets, KenKen and other puzzles, leading group work

Please select all standards that apply to this unit of study:

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- ❑ Apply appropriate academic and technical skills.
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- ❑ Demonstrate creativity and innovation.
- ❑ Employ valid and reliable research strategies.
- ❑ Utilize critical thinking to make sense of problems and persevere in solving them.
- ❑ Model integrity, ethical leadership, and effective management.
- ❑ Plan education and career paths aligned to personal goals.
- ❑ Use technology to enhance productivity.
- ❑ Work productively in teams while using cultural global competence.

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LINKS TO CAREERS:

Unit 5

Geometry

Summary and Rationale

In this unit, an angle is defined as two line segments that share the same endpoint. This is done for simplicity, as the term *ray* is not introduced until Grade 4. Students identify and relate angles, perpendicular lines, and parallel lines to real-life objects and are encouraged to see angles and lines in planes shapes and three-dimensional objects.

Students identify open and closed figures, classify polygons by the number of sides, vertices, and angles, and learn the names of special polygons and quadrilaterals. Quadrilaterals are classified by parallel sides, length of sides, and angles.

Students combine geometry and measurement by learning the concepts of area and perimeter. In finding area and perimeter, students use appropriate units for figures of different sizes and explore the relationship between them.

Recommended Pacing

Chapter 19, Area and Perimeter - 2 weeks (Focus is on area)
Chapter 17, Angles and Lines - 1 week
Chapter 18, Two Dimensional Shapes - 1 week (Lesson 18.1 only)

1	
Geometry	
3.G.1	Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
Measurement & Data	
3.MD.5	Recognize area as an attribute of plane figures and understand concepts of area measurement.
3.MD.5a	Recognize that a square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.
3.MD.5b	Recognize that a plane figure which can be covered without gaps or overlaps by *n* unit square is said to have an area of *n* square units.
3.MD.6	Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units.
3.MD.7	Relate area to the operations of multiplication and addition.
3.MD.7a	Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
3.MD.7b	Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
3.MD.7c	Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths *a* and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.
3.MD.7d	Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.
3.MD.8	Solve real world and mathematical problems involving perimeters of polygons, including finding perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.
Numbers & Operations in Base Ten	
3.NBT.2	Fluently add and subtract within 1,000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Mathematical Practices	
K-12.MP.1	Make sense of problems and persevere in solving them.
K-12.MP.2	Reason abstractly and quantitatively.
K-12.MP.3	Construct viable arguments and critique the reasoning of others.
K-12.MP.5	Use appropriate tools strategically.
K-12.MP.6	Attend to precision.
K-12.MP.8	Look for and express regularity in repeated reasoning.
Interdisciplinary Connections	
Standard x.x	
Integration of Technology	

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Angles and lines can be found all around us and can be described with special names. An angle is defined as two line segments that share the same endpoint. Polygons can be classified by the number of sides, corners, and angles. Figures can be congruent, or symmetrical, or both. The perimeter is the distance around a polygon or the sum of the lengths of its sides. The area is the amount of space which a polygon takes up.	How is an angle formed? How can angles be compared? What are congruent figures? How are area and perimeter different? Are they related?

Evidence of Learning (Assessments)

Objectives (SLO)

Students will know or learn:

- Point
- Angle
- Line, line segment
- Endpoint
- Plane figure, open figure, closed figure
- Polygon
- Vertex
- Quadrilateral
- Parallel
- Rhombus
- Parallelogram
- Pentagon
- Octagon
- Tangram
- Area
- Square units: square centimeter (cm^2), square inch (in^2), square meter (m^2), square foot (ft^2)
- Perimeter

Student will be able to:

- Find angles in plane shapes and real-world objects.
- Compare the number of sides and angles of plane shapes.
- Identify open and closed figures.
- Identify special polygons and quadrilaterals.
- Classify polygons by the number of sides, vertices, and angles.
- Classify quadrilaterals by parallel sides, length of sides, and angles.
- Combine and separate polygons to make other polygons.
- Use square units to find the area of plane figures made of squares and half squares.
- Compare areas of plane figures and make plane figures of the same area.
- Use square centimeter and square inch to find and compare the area of figures.
- Use square meters and square feet to find and compare the area of plane figures.
- Estimate the area of small and large surfaces.
- Find the perimeter of figures formed using small squares.
- Compare the area and perimeter of two figures.
- Multiply the side-lengths to find the are to solve real-world problems.
- Represent whole-number products as rectangular areas.
- Make rectangles with a given area.
- Find the area of figures by separating them into two rectangles and adding their areas.

Suggested Resources/Technology Tools

Math In Focus Resources Chapter 17 Lesson 17.1 ONLY): Understanding & Identifying Angles
Math In Focus Resources Chapter 18 Lesson 18.1 ONLY): Classifying Polygons
*Stress the Hierarchy of Quadrilaterals
Math In Focus Chapter 19: Area & Perimeter
Focus Lesson 19.4a Real-World Problems: Area

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Square tiles
Half-square tiles
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LINKS TO CAREERS: