3rd, 4th and 5th GRADE MATH CURRICULUM

Middle Township Public Schools
216 S. Main Street
Cape May Court House, NJ 08210

Born On Date: September 2017

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Introduction

This document serves to meet all requirements of curriculum as per the Middle Township Board of Education and the New Jersey Department of Education and will serve as a guide for lesson planning. Units within the curricular framework for Mathematics are designed to be taught in the order in which they are presented. Within the units, the teachers have flexibility of what order to present the standards.

Course Description

In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes.

For more than a decade, research studies of mathematics education in high-performing countries have concluded that mathematics education in the United States must become substantially more focused and coherent in order to improve mathematics achievement in this country. To deliver on this promise, the mathematics standards are designed to address the problem of a curriculum that is "a mile wide and an inch deep."

The math standards provide clarity and specificity rather than broad general statements. The standards draw on the most important international models for mathematical practice, as well as research. They endeavor to follow the design envisioned by William Schmidt and Richard Houang (2002), by not only stressing conceptual understanding of key ideas, but also by continually returning to organizing principles (coherence) such as place value and the laws of arithmetic to structure those ideas.

In addition, the "sequence of topics and performances" that is outlined in a body of math standards must respect what is already known about how students learn. As Confrey (2007) points out, developing "sequenced obstacles and challenges for students…absent the insights about meaning that derive from careful study of learning, would be unfortunate and unwise." Therefore, the development of the standards began with research-based learning progressions detailing what is known today about how students' mathematical knowledge, skill, and understanding develop over time. The knowledge and Skills students need to be prepared for mathematics in college, career, and life are woven throughout the mathematics standards.

Pacing Guide

Recommended Third Grade Mathematics Pacing Guide			
First Marking Period	**Days 1- 45**		
	September 18 days	**October 20 Days**	**November 18 days**
	Unit One- Understanding Properties of Multiplication and Division		Unit Two- Numbers and Operations in Base Ten
Second Marking Period	**Days 46- 90**		
	November (Continued) 18 days	**December 15 days**	**January 20 days**
	Unit Two- Continued	Unit Three- Numbers and Operations- Fractions	
Third Marking Period	**Days 91- 135**		
	February 18 days	**March 21 days**	**April 16 days**
	Unit Three		
Fourth Marking Period	**Days 136-180**		
	April (Continued) 16 days	**May 22 days**	**June 12 days**

Pacing Guide

UNIT TITLE	ENDURING UNDERSTANDINGS	NJSLS	TIMEFRAME
1- Understanding Properties of Multiplication and Division	• Represent and solve problems involving multiplication and division • Understand properties of multiplication and the relationship between multiplication and division • Multiply and divide within 100 • Solve problems involving the four operations, and identify and explain patterns in arithmetic	**3.0A.1.** **3.0A.2.** **3.0A.3.** **3.0A.4.** **3.0B.6.** **3.0C.7.**	**36 days**
2- Numbers and Operations in Base Ten	• Understanding place value can lead to number sense and efficient strategies for computing with numbers	**3.NBT A**	**18 days**
3- Numbers and Operations- Fractions	• Fractions allow for quantities to be expressed with greater precision than with just whole numbers	**3.NF.1** **3.NF.2 (a-b)** **3.NF.3 (a- d)**	**40 days**

Content Area:	Math – 3rd Grade	Grade(s) 3rd
Unit Plan Title:	Unit 1: Understand Properties of Multiplication and Division	

Overview/Rationale

Students develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models. Students will use sophisticated strategies to solve various multiplication and division problems that involve single-digit factors. Students will identify and learn the relationship between multiplication and division by being able to compare the learned solution strategies.

Standard(s) Number and Description

3.0A. Represent and solve problems involving multiplication and division

1. Interpret products of whole numbers
2. Interpret whole-number quotients of whole numbers
3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities
4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers

3.0B. Understand properties of multiplication and the relationship between multiplication and division

5. Apply properties of operations as strategies to multiply and divide
6. Understand division as an unknown-factor problem.

3.0C. Multiply and divide within 100

7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

Math Practice Standards Number and Description

MP1 Make sense of problems and persevere in solving them
MP2 Reason abstractly and quantitatively
MP3 Construct viable arguments and critique the reasoning of others
MP4 Model with mathematics
MP5 Use appropriate tools strategically
MP6 Attend to precision
MP7 Look for and make use of structure
MP8 Look for and express regularity in repeated reasoning

Technology Standard(s) Number and Description

8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems
8.1.5.A.3 Use a graphic organizer to organize information about problem or issue
8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities
8.1.2. C.1 Engage in a variety of develop mentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media.

Interdisciplinary Standard(s) Number and Description

NJSLSA.SL1. *Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively*

NJSLSA.SL2. *Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally*

NJSLSA.SL4. *Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience*

NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations

Enduring Understandings:

Students will understand that…

- Represent and solve problems involving multiplication and division
- Understand properties of multiplication and the relationship between multiplication and division
- Multiply and divide within 100
- Solve problems involving the four operations, and identify and explain patterns in arithmetic

Essential Questions :

- **When should we multiply and divide?**
- **How is multiplication related to division?**
- **What are key words to indicate multiplication/division?**
- **How do we relate multiplication and division through fact families?**
- **What patterns can we recognize within multiplication/division?**
- **How do we make sense of a multi-step word problem?**
- **What tools, diagrams, and/or strategies can I apply to solve a problem?**
- **How can I critique the reasoning of others to help me understand?**
- **How can I represent a multiplication or division problem?**

21st Century Connections:

Check all that apply. **21st Century Interdisciplinary Themes**	**21st Century Skills**

	X	Global Awareness		E T A	Critical Thinking and Problem Solving
		Environmental Literacy		E T A	Creativity and Innovation
		Health Literacy		E T	Communication and Collaboration
		Civic Literacy		E	Flexibility and Adaptability
	X	Financial, Economic , Business and Entrepreneurial Literacy		E	Initiative and Self-Direction
				E	Social and Cross-Cultural Skills
				E T A	Productivity and Accountability
				E	Leadership and Responsibility
				E T A	Informational Literacy Skills
				E	Media Literacy Skills
				E	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.*

	E	CRP1. Act as a responsible and contributing citizen and employee
	ET	CRP2. Apply appropriate academic and technical skills
	E	CRP3. Attend to personal health and financial well-being
	ETA	CRP4. Communicate clearly and effectively with reason
	E	CRP5. Consider the environmental, social and economic impacts of decisions
	E T	CRP6. Demonstrate creativity and innovation
	E	CRP7. Employ valid and reliable research strategies
	E T A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them

	E	CRP9. Model integrity, ethical leadership, and effective management
		CRP10. Plan education and career paths aligned to personal goals
	E	CRP11. Use technology to enhance productivity
	E	CRP12. Work productively in teams while using cultural global competence

Student Learning Goals/Objectives:

Students will know…. • ***how to apply properties of operations as strategies to multiply and divide.*** • ***use commutative property of multiplication to solve problems.*** • ***relationship between multiplication/division*** • ***the rules that apply to multiplication*** • ***how to solve a multi-step and the strategies that can be applied*** • ***what tools can be used to solve multiplication/division problems*** • ***make decisions on how to solve problems based on the key words within the problem*** • ***how to critique the reasoning of others and reflect on their own thinking process (metacognition)*** **** how to represent multiplication/division problems using manipulatives and diagrams***	***Students will….*** • ***successfully solve multiplication/division problems using grade-appropriate strategies and tools to represent and explain their rationale and thinking***

Key Vocabulary and Terms:

- ***Array***
- ***equal groups/ equal shares***
- ***factor***
- ***fact families***
- ***equation***
- ***multiplication***

- ***division***
- ***quotient***
- ***product***
- ***Commutative Property***
- ***Justify***
- ***Associative Property***
- ***Equivalent***
- ***Operation***
- ***Pattern***
- ***Represent***
- ***Strategy***
- ***Properties***
- ***Compare***
- ***Analyze***
- ***Classify***

Assessment Evidence:

Performance Tasks:

Quick Look Cards

Mental Math and Fluency

Slate

Number Grids

Multiplication Charts

Counters

Other Assessment Measures*:*

Summative

- Quizzes
- Unit Tests
- Diagnostic Assessments

Formative

- Entry/ Exit Slips
- Progress Monitoring
- Classwork/ Homework
- Guided Practice
- Open Response Assessments
- Math Boxes

****Include Benchmarks***

Instructional Strategies and Activities (add rows as needed) ***D** **Title**	***Consider how will the design will:*** **Description with Modifications, number of days, etc.**
1.	
2.	
3.	
Resources:	
Everyday Mathematics 4, Volumes 1 and 2, Brainpop Jr. Engage NY Eureka Math STAR Renaissance School House Rock *Amanda Beans Amazing Dream* by Cindy Neuschwander *The Lion's Share* by Matthew McElligott *Two Times Two Equals Boo!* By Laureen Leedy Flocabulary Coolmath.com Abcya.com Aaamath.com Mathplayground.com	
Suggested Time Frame:	36 days

**D* – Indicates differentiation at the Lesson Level (Identify Modifications for ELL, Gifted and Talented, Basic Skills, Special Education)

Content Area:	Math – 3rd Grade	Grade(s) 3rd
Unit Plan Title:	**Unit 2: Number and Operations in Base Ten**	

Overview/Rationale

Students will develop an understanding of rounding whole numbers to the nearest 10 or 100. Using strategies based on place value and properties of operations, students will fluently add and subtract to 1000 and multiply one-digit whole numbers by multiples of 10 in the range of 10-90.

Standard(s) Number and Description

3.NBT Number and Operations in Base Ten

A. Use place value understanding and properties of operations to perform multi-digit arithmetic (a range of algorithms may be used)

1. Use place value to round whole numbers to the nearest ten or hundred
2. Fluently add and subtract within 1,000 using strategies and algorithm based on place value, properties of operations, and/or the relationship between addition and subtraction
3. Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9x80, 5x60) using strategies based on place value and properties of operations

Math Practice Standards Number and Description

MP1 Make sense of problems and persevere in solving them
MP2 Reason abstractly and quantitatively
MP3 Construct viable arguments and critique the reasoning of others
MP4 Model with mathematics
MP5 Use appropriate tools strategically
MP6 Attend to precision
MP7 Look for and make use of structure
MP8 Look for and express regularity in repeated reasoning

Technology Standard(s) Number and Description

8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems
8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/or pictures
8.1.5.A.3 Use a graphic organizer to organize information about problem or issue
8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities
8.1.2. C.1 Engage in a variety of develop mentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media.

Interdisciplinary Standard(s) Number and Description

NJSLSA.SL1. *Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively*
NJSLSA.SL2. *Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally*
NJSLSA.SL4. *Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience*
NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations

Enduring Understandings:

Students will understand that…
Understanding place value can lead to number sense and efficient strategies for computing with numbers

Essential Questions :

- **When and how do we use rounding?**
- **How is expanded form related to place value?**
- **How do I apply place value understanding for multi-digit whole numbers?**
- **How do I use place value and properties of operations to perform multi-digit arithmetic?**
- **What mental math strategies can I use to solve problems?**
- **Why is your thinking about the process as important as the process?**
- **Why is it possible to get the same answer using different numbers or operations?**
- **How do key words help me choose which operation to apply?**
- **How can I learn from analyzing others' work?**

21st Century Connections

Check all that apply. 21st Century Interdisciplinary Themes		21st Century Skills	
X	Global Awareness	E T A	Critical Thinking and Problem Solving
	Environmental Literacy	E T A	Creativity and Innovation
	Health Literacy	E T	Communication and Collaboration
	Civic Literacy	E	Flexibility and Adaptability

X	Financial, Economic , Business and Entrepreneurial Literacy	E	Initiative and Self-Direction
		E	Social and Cross-Cultural Skills
		E T A	Productivity and Accountability
		E	Leadership and Responsibility
		E T A	Informational Literacy Skills
		E	Media Literacy Skills
		E	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.*

E	CRP1. Act as a responsible and contributing citizen and employee
ET	CRP2. Apply appropriate academic and technical skills
E	CRP3. Attend to personal health and financial well-being
ETA	CRP4. Communicate clearly and effectively with reason
E	CRP5. Consider the environmental, social and economic impacts of decisions
E T	CRP6. Demonstrate creativity and innovation
E	CRP7. Employ valid and reliable research strategies
E T A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals
E	CRP11. Use technology to enhance productivity
E	CRP12. Work productively in teams while using cultural global competence

Student Learning Goals/Objectives:

Students will know….	***Students will….***
• ***how to apply properties of operations as strategies to add and subtract*** • ***use commutative property of addition to solve problems.*** • ***relationship between addition/subtraction*** • ***the rules that apply to subtraction*** • ***rounding whole numbers to nearest 10 and 100*** • ***adding and subtracting within 1,000 by using an algorithm or strategy based on place value***	• ***successfully solve addition/subtraction problems using grade-appropriate strategies and tools to represent and explain their rationale and thinking*** • ***solve multi-step problems with success using the appropriate strategies and algorithms***
Key Vocabulary and Terms:	
• ***Base Ten*** • ***Multi-digit*** • ***Rounding*** • ***Estimation*** • ***Addends*** • ***Sum*** • ***Difference*** • ***Place Value*** • ***Commutative Property***	
Assessment Evidence:	
Performance Tasks: Quick Look Cards Mental Math and Fluency Slate Number Grids Multiplication Charts Counters	**Other Assessment Measures*:*** ***Summative*** • Quizzes • Unit Tests • Diagnostic Assessments ***Formative*** • Entry/ Exit Slips • Progress Monitoring • Classwork/ Homework

	• Guided Practice • Open Response Assessments • Math Boxes ***Include Benchmarks***
*Instructional Strategies and Activities (add rows as needed)*D* **Title**	***Consider how will the design will:*** **Description with Modifications, number of days, etc.**
4.	
5.	
6.	
Resources:	
Everyday Mathematics 4, Volumes 1 and 2, Brainpop Jr. Engage NY Eureka Math STAR Renaissance Flocabulary *Five Silly Fisherman* by Mark A. Edwards *12 Ways to Get to # 11* by Eve Merriam Coolmath.com Abcya.com Aaamath.com Mathplayground.com	
Suggested Time Frame:	18 days

**D* – Indicates differentiation at the Lesson Level (Identify Modifications for ELL, Gifted and Talented, Basic Skills, Special Education)

Content Area:	Math – 3rd Grade	Grade(s) 3rd
Unit Plan Title:	Unit 3: Numbers and Operations - Fractions	

Overview/Rationale

Students develop an understanding of fractions, beginning with unit fractions. Visual fraction models, including the introductory unit fraction, are used to represent parts of a whole. Students understand that the size of a fractional part is relative to the size of the whole. 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.

Standard(s) Number and Description

3.NF Number and 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. a. Represent a fraction 1/b on a number line diagram by defining the interval from 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. b. Represent a fraction a/b on a number line diagram by marking off a lengths 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. a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3).Explain why the fractions are equivalent, e.g., by using a visual fraction model. c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram. d. 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

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Technology Standard(s) Number and Description

8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems

8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/or pictures
8.1.5.A.3 Use a graphic organizer to organize information about problem or issue
8.1.5. A.4 Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.
8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities
8.1.2. C.1 Engage in a variety of develop mentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media.

Interdisciplinary Standard(s) Number and Description

NJSLSA.SL1. *Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively*
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NJSLSA.SL4. *Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience*
NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations

Enduring Understandings:

Students will understand that…
Fractions allow for quantities to be expressed with greater precision than with just whole numbers

Essential Questions :

- How do we show a part of something?
- How can you represent and locate fractions on a number line?
- How can I use a fractional number line to compare and order fractions?
- What does a fraction represent?
- How can visual fraction models help me find equivalent fractions?

21st Century Connections

Check all that apply. 21st Century Interdisciplinary Themes		21st Century Skills	
X	**Global Awareness**	**E T A**	**Critical Thinking and Problem Solving**
	Environmental Literacy	**E T A**	**Creativity and Innovation**

	Health Literacy
	Civic Literacy
X	Financial, Economic , Business and Entrepreneurial Literacy

E T	Communication and Collaboration
E	Flexibility and Adaptability
E	Initiative and Self-Direction
E	Social and Cross-Cultural Skills
E T A	Productivity and Accountability
E	Leadership and Responsibility
E T A	Informational Literacy Skills
E	Media Literacy Skills
E	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.*

E	CRP1. Act as a responsible and contributing citizen and employee
ET	CRP2. Apply appropriate academic and technical skills
E	CRP3. Attend to personal health and financial well-being
ETA	CRP4. Communicate clearly and effectively with reason
E	CRP5. Consider the environmental, social and economic impacts of decisions
E T	CRP6. Demonstrate creativity and innovation
E	CRP7. Employ valid and reliable research strategies
E T A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals

	E	**CRP11. Use technology to enhance productivity**
	E	**CRP12. Work productively in teams while using cultural global competence**

Student Learning Goals/Objectives:

Students will know…..	***Students will….***
• *fractions represent equal parts* • *what the numerator and denominator tells about the fraction* • *that the intervals on a number line are equal parts* • *how to recognize and generate simple and equivalent fractions* • *that two fractions are equivalent if they are the same size or the same point on a number line* • *how to express whole numbers as fractions* • *use reasoning about fraction size to compare*	• Plot fractions on a number line • Accurately compare fractions • Explain what makes fractions equivalent • Write fractions based on a visual representation

Key Vocabulary and Terms:

- ***Numerator***
- ***Denominator***
- ***Fraction***
- ***Whole/part***
- ***Equivalent***
- ***Compare***
- ***Fraction Number Line***

Assessment Evidence:

Performance Tasks:	**Other Assessment Measures*:***
Quick Look Cards Mental Math and Fluency Slate Number Grids Multiplication Charts	***Summative*** • ***Quizzes*** • ***Unit Tests*** • ***Diagnostic Assessments***

Counters	***Formative*** • ***Entry/ Exit Slips*** • ***Progress Monitoring*** • ***Classwork/ Homework*** • ***Guided Practice*** • ***Open Response Assessments*** • ***Math Boxes*** ****Include Benchmarks***

Instructional Strategies and Activities (add rows as needed) **D* **Title**	***Consider how will the design will:*** **Description with Modifications, number of days, etc.**
7.	
8.	
9.	

Resources:
Everyday Mathematics 4, Volumes 1 and 2, Brainpop Jr. Engage NY Eureka Math STAR Renaissance Flocabulary Fraction Top-It Fraction Bingo *The Hershey's Milk Chocolate Fraction Book* by Jerry Pallota *Whole-y Cow* by Taryn Souder

The Doorbell Rang by Pat Hutchins Coolmath.com Abcya.com Fraction Circles Aaamath.com Mathplayground.com	
Suggested Time Frame:	40 days

**D* – Indicates differentiation at the Lesson Level (Identify Modifications for ELL, Gifted and Talented, Basic Skills, Special Education)

Curriculum Map- 3rd Grade Mathematics

Grade 3		Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
3. OA – Operations & Algebraic Thinking							
A. Represent and solve problems involving multiplication and division.							
3.0A.1	Interpret products of whole numbers, e.g., interpret 5 x 7 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.	✔					
3.0A.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 equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be*	✔					
3.0A.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	✔					
3.0A.4	Determine the unknown whole number in a multiplication or 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 = ?*	✔					
B. Understand properties of multiplication and the relationship between multiplication and division.							
3.0A.5	Apply properties of operations as strategies to multiply and divide.[2] *Examples:* *f 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 8x 7 as8x (5 + 2) = (8 x 5) + (8x 2) =40+ 16= 56. (Distributive property.)*	✔					

3.0A.6	Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*	✔					
C. Multiply and divide within 100.							
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.	✔					
D. Solve problems involving the four operations, and identify and explain patterns in arithmetic							
3.0A.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.						
3.0A.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.*						
3. NBT - Number & Operations in Base Ten							
A. Use place value understanding and properties of operations to perform multi-digit arithmetic.							
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 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.		✔				
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.		✔				
3. NF – Number & Operations — Fractions							
A. Develop understanding of fractions as numbers.							

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 (a-b)	Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Represent a fraction 1/b on a number line diagram by defining the interval from 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. b. Represent a fraction a/b on a number line diagram by marking off a lengths 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.			✔			
B. Develop understanding of fractions as numbers - continued.							
3.NF.3 (a-d)	Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model. c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram. d. 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.			✔			
3. MD - Measurement and Data							

A. Solve problems involving measurement and estimation of intervals of time liquid volumes, and masses of objects.							
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 OW Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.[2]						
B. Represent and interpret data.							
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.*						
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, or quarters.						
C. Geometric measurement: understand concepts of area and relate area to multiplication and to addition.							
3.MD.5 (a-b)	Recognize area as an attribute of plane figures and understand concepts of area measurement. a. 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. b. A plane figure which can be covered without gaps or overlaps by n unit squares 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 (a-d)	Relate area to the operations of multiplication and addition. a. 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. b. 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. c. 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. d. 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.						
D. Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.							
3.MD.8	Solve real world and mathematical problems involving perimeters of polygons, including finding the 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.						
3. G - Geometry							
A. Reason with shapes and their attributes.							
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.						
3.G.2	Partition shapes into parts with 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 1/4 of the area of the shape.*						

4th GRADE MATH CURRICULUM

Middle Township Public Schools
216 S. Main Street
Cape May Court House, NJ 08210

Table of Contents

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Introduction

This document serves to meet all requirements for curriculum as per the Middle Township Board of Education and the New Jersey Department of Education and will serve as a guide for lesson planning. Units within the curricular framework for mathematics are designed to be taught in the order in which they are presented. There is a logical and developmentally appropriate progression of standards, with strong consideration given to Major, Supporting, and Additional content standards presented since most concepts build upon each other. Within Supporting and Additional clusters of mathematics content standards are based on the New Jersey Student Learning Standards. Suggested Mathematical Practice Standards are listed in each unit to be imbedded regularly in daily math instruction.

Course Description

The principles for school mathematics address the overarching themes of equity, curriculum, teaching, learning, assessment and technology. (NCTM, 2000)

Equity: Excellence in mathematics education requires equity – high expectations, worthwhile opportunities, accommodation for differences, resources, and strong support for all students.

Curriculum: A coherent curriculum effectively organizes standards and mathematical ideas, focuses on important mathematics, and is well articulated within and across grades.

Teaching: Effective standards-aligned mathematics instruction is a complex endeavor that requires understanding what students know and need to learn, and then challenging and supporting them to learn it well. Effective teaching requires continually seeking improvement.

Learning: Conceptual understanding is an important component of proficiency. Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge. Learning with understanding is essential to enable students to solve the new kinds of problems they will inevitably face in the future.

Assessment: Standards-aligned assessment, a routine part of ongoing classroom activity, should enhance students' learning and inform instructional decisions.

Technology: Technology, not to be used as a replacement for basic understandings and intuitions, is an essential tool in teaching and learning mathematics; it influences the mathematics that is taught, supports visualization, facilitates organizing and analyzing data, and offers efficient computation.

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.

Pacing Guide

Recommended Fourth Grade Mathematics Pacing Guide			
First Marking Period	**Days 1- 45**		
	September 18 days	**October 20 Days**	**November 18 days**
	Unit One: Place Value, Addition and Subtraction	Unit Two: Multiplication and Division	
Second Marking Period	**Days 46- 90**		
	November (Continued) 18 days	**December 15 days**	**January 20 days**
	Unit Two: Continued		Unit Three: Fractions and Decimals
Third Marking Period	**Days 91- 135**		
	February 18 days	**March 21 days**	**April 16 days**
	Unit Three: Continued		Unit Four: Measurement
Fourth Marking Period	**Days 136-180**		
	April (Continued) 16 days	**May 22 days**	**June 12 days**
	Unit Four: Continued	Unit Five: Geometry	

Pacing Guide

UNIT TITLE	ENDURING UNDERSTANDINGS	NJSLS	TIMEFRAME
4- Place Value, Addition, and Subtraction	•As digits progress from right to left, their individual value increases ten times. •Place value is based on groups of ten and the value of a number is determined by the place of its digits. •A number can be written using its name, standard, or expanded form. •Rounding numbers can be used when estimating answers to real-world problems. •Place value understanding and properties of operations are necessary to solve multi-digit arithmetic. •The standard algorithm for addition and subtraction relies on adding or subtracting like base-ten units.	**4.NBT.1** **4.NBT.2** **4.NBT.3** **4.NBT.4**	**15-20 days**
5- Multiplication and Division	• Multiplication and division are inverse operations. •A whole number is a multiple of each of its factors. •Understanding place value and properties of operations is necessary to perform multi-digit multiplication and division. •There are three different structures for multiplication and division problems: area/array, equal groups, and comparison, and the unknown quantity in multiplication and division situations is represented in three ways: unknown products, group size unknown, and number of groups unknown. •Some division situations will produce a remainder, but the remainder should always be less than the divisor. If the remainder is greater than the divisor that means at least one more can be given to each group or at least one more group of the given size may be created. When using division to solve word problems, how the remainder is interpreted depends on the problem situation.	**4.OA.A.1** **4. OA.A.2** **4.OA.A.3** **4.OA.B** **4.OA.B.4** **4.OA.C.5** **4.NBT.B.5** **4.NBT.B.6**	**50 days**
6- Fractions and Decimals	• Use comparing, ordering, and equivalent fractions to extend understanding of fractions. • Fractions can be represented visually and in written form. •Comparisons are only valid when the two fractions refer to the same whole. • Fractions and mixed numbers are composed of unit fractions and can be decomposed as a sum of unit fractions. • Improper fractions and mixed numbers express the same value. • Using students' previous knowledge of the properties of whole numbers in addition and subtraction will aid in teaching of addition and	**4.4.NF.A.1** **4.4.NF.A.2** **4.4.NF.B.3a** **4.4.NF.B.3b** **4.4.NF.B.3c** **4.4.NF.B.3d** **4.4.NF.B.4a** **4.4.NF.B.4b**	**60 days**

	subtraction of fractions. • Addition and subtraction of fractions involves joining and separating parts referring to the same whole. • Multiplying a fraction by a whole number is a logical step after multiplication of whole numbers. • A product of a fraction times a whole number can be written as a multiple of a unit fraction. • Decimal notation is another way to represent a fraction. • Fractions with denominators of 10 can be expressed as an equivalent fraction with a denominator of 100. • Fractions with denominators of 10 and 100 may be expressed when using decimal notation. • When comparing two decimals to hundredths, the comparisons are only valid if they refer to the same whole.	**4.4. NF.B.4c** **4.4. NF.C.5** **4.4. NF.C.6** **4.4. NF.C.7**	
7- Measurement	• Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. • Represent and interpret data. • Geometric measurement: understand concepts of angle and measure angles.	**MA.4.4.MD.A.1** **MA.4.4.MD.A.2.** **MA.4.4.MD.A.3** **MA.4.4.MD.B** **MA.4.4.MD.B.4** **MA.4.4.MD.C** **MA.4.4.MD.C.5** **MA.4.4.MD.C.5a.** **MA.4.4.MD.C.5b** **MA.4.4.MD.C.6** **MA.4.4.MD.C.7**	**15-20 days**
8- Geometry	• Line segments and rays are sets of points that describe parts of lines, shapes and solids. • Angles are formed by two intersecting lines or by rays with a common endpoint and are classified by shape. • Angles can be classified by the fraction of the circle cut off by its rays. • Polygons can be described and classified by their sides and angles. • The best way to measure an angle is to use a mathematical tool called a protractor.	**MA.4.4.G.A** **MA.4.4.G.A.1** **MA.4.4.G.A.2** **MA.4.4.G.A.3** **MA.4.4.MD.C.5** **MA.4.4.MD.C.5a**	**14-16 days**

	The angle is measured by noting where the second ray intersects the arc of the protractor.	**MA.4.4.MD.C.5b** **MA.4.4.MD.C.6** **MA.4.4.MD.C.7**	

Content Area:	Math	Grade(s) 4
Unit Plan Title:	Unit One: Place Value, Addition and Subtraction	

Overview/Rationale

In this unit students extend their understanding of the base ten systems. They work with multi-digit numbers to practice comparing, ordering, rounding, and writing numbers in expanded form. They begin on fluency with addition and subtraction of multi-digit whole numbers using the standard algorithm.

Standard(s)Number and Description

4.NBT.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.
4.NBT.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.
4.NBT.3 Use place value understanding to round multi-digit whole numbers to any place.
4.NBT.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Math Practice Standards Number and Description

MP1 Make sense of problems and persevere in solving them. Make sense of your problem. Reflect on your thinking as you solve your problem. Keep trying when your problem is hard. Check whether your answer makes sense. Solve problems in more than one way. Compare the strategies you and others use.
MP2 Reason abstractly and quantitatively. Create mathematical representations using numbers, words, pictures, symbols, gestures, tables, graphs and concrete objects. Make sense of the representations you and others use. Make connections between representations.
MP3 Construct viable argument and critique the reasoning of others. Make mathematical conjectures and arguments.
MP4 Model with mathematics real-world situations using graphs, drawings, tables, symbols, numbers, diagram, and other representations. Use mathematical models to solve problems and answer questions.
MP5 Use appropriate tools strategically. Choose appropriate tools. Use tools effectively and make sense of your results.
MP6 Attend to precision. Explain your mathematical thinking clearly and precisely. Use an appropriate level of precision for your problem. Use clear labels, units, and mathematical language. Think about accuracy and efficiency when you count, measure, and calculate.
MP7 Look for and make use of structure. Look for mathematical structures such as categories, patterns, and properties. Use structures to solve problems and answer questions.

Technology Standard(s)Number and Description

TECH.8.1.5 - [Standard] - All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

TECH.8.1.5.B - [Strand] - Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.5.C - [Strand] - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.5.E - [Strand] - Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.5.F - [Strand] - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
TECH.8.2.5.E - [Strand] - Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

Interdisciplinary Standard(s)Number and Description

LA.4.RI.4.7 - [Progress Indicator] - Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.
LA.4.W.4.2 - [Progress Indicator] - Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
LA.4.W.4.2.D - Use precise language and domain-specific vocabulary to inform about or explain the topic.
LA.4.W.4.4 - [Progress Indicator] - Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
LA.4.SL.4.1 - [Progress Indicator] - 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.
SCI.3-4.5.1.4.B - [Strand] - Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.
SCI.3-4.5.1.4.D - [Strand] - The growth of scientific knowledge involves critique and communication, which are social practices that are governed by a core set of values and norms.

Enduring Understandings: The focus of this unit is to provide students time to develop and practice efficient addition and subtraction of multi-digit whole numbers while developing place value concepts.

- As digits progress from right to left, their individual value increases ten times.
- Place value is based on groups of ten and the value of a number is determined by the place of its digits.
- A number can be written using its name, standard, or expanded form.
- Rounding numbers can be used when estimating answers to real-world problems.
- Place value understanding and properties of operations are necessary to solve multi-digit arithmetic.
- The standard algorithm for addition and subtraction relies on adding or subtracting like base-ten units.

Students will understand that…

They can generalize place value understanding for multi-digit whole numbers.
Use place value understanding and properties of operations of addition and subtraction to perform multi-digit arithmetic.

Essential Questions :

How does using the concept of place value help us to understand the relationship of multi-digit whole numbers?
How does understanding place value help us solve multi-digit addition and subtraction problems using the standard algorithm?
How does the concept of place value help us to understand the relationship of multi-digit whole numbers?
How does the value of a digit change within a number?
How can place value understanding help us with comparing, ordering, and rounding whole numbers?
How can the value of digits be used to compare two numbers?
In what ways can numbers be composed and decomposed?
How are greater numbers read and written?
How can my understanding of place value explain the process of addition and subtraction?
How are addition and subtraction related to one another?
How does understanding place value help us solve multi-digit addition and subtraction problems, and how can rounding be used to estimate answers to problems?
What are standard procedures for adding and subtracting numbers?

21st Century Connections:

Check all that apply.

21st Century Interdisciplinary Themes

X	**Global Awareness**
	Environmental Literacy
	Health Literacy
	Civic Literacy
X	**Financial, Economic , Business and Entrepreneurial Literacy**

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, and/or **A**-Assessed in this unit by marking **E, T, A** in the box before the appropriate skill*

21st Century Skills

E T A	**Critical Thinking and Problem Solving**
E T A	**Creativity and Innovation**
E T	**Communication and Collaboration**
E	**Flexibility and Adaptability**
E	**Initiative and Self-Direction**
E	**Social and Cross-Cultural Skills**
ETA	**Productivity and Accountability**
E	**Leadership and Responsibility**
E T A	**Informational Literacy Skills**

E	**Media Literacy Skills**
E	**Information, Communication, and Technology (ICT) Literacy**

Career Ready Practices:

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.*

E	**CRP1. Act as a responsible and contributing citizen and employee**
E T A	**CRP2. Apply appropriate academic and technical skills**
E	**CRP3. Attend to personal health and financial well-being**
E T A	**CRP4. Communicate clearly and effectively with reason**
E	**CRP5. Consider the environmental, social and economic impacts of decisions**
E T A	**CRP6. Demonstrate creativity and innovation**
E	**CRP7. Employ valid and reliable research strategies**
E T A	**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them**
E	**CRP9. Model integrity, ethical leadership, and effective management**
	CRP10. Plan education and career paths aligned to personal goals
E	**CRP11. Use technology to enhance productivity**
E	**CRP12. Work productively in teams while using cultural global competence**

Student Learning Goals/Objectives:

Students will know….	***Students will be able to (do)…***
1. To analyze and demonstrate the quantitative relationship between places of a multi-digit whole number up to one million when moving from right to left. 2. To practice reading and writing multi-digit whole numbers using base-ten numerals, number names, and expanded form. 3. To apply place value understanding to round multi-digit whole numbers to any place.	1. For example, students will demonstrate using base ten blocks that 700/ 70 = 10 by applying concepts of place value and division. 2. Compare two multi-digit numbers based

4. To complete adding and subtracting multi-digit whole numbers accurately using the standard algorithm.	on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. 3. Show rounding of stated number to a specified place using white boards. 4. Solve addition and/or subtraction of multi-digit numbers using the U.S. traditional method with grid paper or white boards as needed.

Key Vocabulary and Terms:

- =, <, > (equal to, less than, greater than)
- Addend (e.g., in 4 + 5, the numbers 4 and 5 are the addends)
- Algorithm (a step-by-step procedure to solve a particular type of problem)
- Difference (answer to a subtraction problem)
- Digit (any of the numbers 0 to 9; e.g., What is the value of the digit in the tens place?)
- Expanded form (e.g., 100 + 30 + 5 = 135)
- Number line (a line marked with numbers at evenly spaced intervals)
- Number sentence (e.g., 4 + 3 = 7)
- Place value (the numerical value that a digit has by virtue of its position in a number)
- Rounding (approximating the value of a given number)
- Standard form (a number written in the format 135)
- Sum (answer to an addition problem)
- Word form (e.g., one hundred thirty-five)

Assessment Evidence:

***Performance Tasks*:**	**Other Assessment Measures*:***
Number grid puzzles (show correct sequential order of numbers) Place value charts (correctly place digit) Comparing numbers (<, >, =) Number line comparisons	Summative • Quizzes • Unit Test • Diagnostic Assessments

Base-ten blocks Estimation strategies (rounding and front end estimation) Solving word problems https://prc.parcconline.org/assessments/parcc-released-items http://www.insidemathematics.org/performance-assessment-tasks http://ccssmathactivities.com/performance-tasks-grade-4/ http://www.ccsstoolbox.com/ (PARCC Prototype Tasks)	Formative • Slate Assessments • Entry/Exit Slips • Progress Monitoring • Classwork/ Homework • Guided Practice • Open Response Assessments

Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)

Instructional Strategies and Activities (add rows as needed) *D **Title**	***Consider how will the design will:*** **Description with Modifications, number of days, etc.**
1. Place Value Flip Book or Chart	Students make a flip book or chart to show place value up to millions place. 1-2 Days *D Teacher models and helps label the place value chart. • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
2. Using the U.S. traditional method for addition	Using slates, whiteboards, or grid paper students will solve multi-digit addition problems. 1-2 Days *D On graph paper, draw vertical lines to correctly align the digits to solve problems. • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers

	• Breaking down the task
3. Using the U.S. traditional method for subtraction	Using slates, whiteboards, or grid paper students will solve multi-digit subtraction problems with regrouping. 3-5 Days *D On graph paper, draw vertical lines to correctly align the digits to solve problems. Use base ten blocks to model regrouping. • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
4. Rounding multi-digit numbers	Using various number lines, students find half way point, then plot a number greater than or less than the half way number. 2-3 Days *D – Students use place value flip book previously created to build a number and flip the pages to identify the higher or lower numbers. • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
Resources:	
District Approved Textbook, http://eurekamathhelp.piqua.org/student-math-resources/fourth-grade-resources https://www.engageny.org/resource/grade-4-mathematics http://www.insidemathematics.org/assets/problems-of-the-month/miles%20of%20tiles.pdf	
Suggested Time Frame(Days):	15-20 days

*D– Indicates differentiation at the Lesson Level (Identify Modifications for ELL, Gifted and Talented, Basic Skills, Special Education)

Content Area:	**Math**	**Grade(s) 4**
Unit Plan Title:	**Unit Two: Multiplication and Division**	

Overview/Rationale

Students begin their work in Grade 4 by revisiting their work with multiplication and division through 100 from Grade 3. They develop an understanding of multiplicative comparisons, distinguishing it from additive comparisons. They continue their study of the base-ten system, and compare, order, and round base-ten numbers. They multiply and divide multi-digit numbers, and illustrate and explain calculations using equations, arrays, and area models. They solve word problems involving adding, subtracting, multiplying, and dividing whole numbers.

Standard(s) Number and Description

4.OA.A.1 *- [Standard] - 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.*

4. OA.A.2 *- [Standard] - 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.*

4.OA.A.3 *- [Standard] - 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.*

4. OA.B *- Gain familiarity with factors and multiples.*

4. OA.B.4 - [Standard] - 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.

4. OA.C.5 *- [Standard] - 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.*

4. NBT.B.5 *- [Standard] - 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.*

4.NBT.B.6 *- [Standard] - 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.*

Math Practice Standards Number and Description

MP1 Make sense of problems and persevere in solving them. Make sense of your problem. Reflect on your thinking as you solve your problem. Keep trying when your problem is hard. Check whether your answer makes sense. Solve problems in more than one way. Compare the strategies you and others use.
MP2 Reason abstractly and quantitatively. Create mathematical representations using numbers, words, pictures, symbols, gestures, tables, graphs and concrete objects. Make sense of the representations you and others use. Make connections between representations.
MP3 Construct viable argument and critique the reasoning of others. Make mathematical conjectures and arguments.
MP4 Model with mathematics Model real-world situations using graphs, drawings, tables, symbols, numbers, diagram, and other representations. Use mathematical models to solve problems and answer questions.
MP5 Use appropriate tools strategically. Choose appropriate tools. Use tools effectively and make sense of your results.
MP6 Attend to precision. Explain your mathematical thinking clearly and precisely. Use an appropriate level of precision for your problem. Use clear labels, units, and mathematical language. Think about accuracy and efficiency when you count measure and calculate.
MP7 Look for and make use of structure. Look for mathematical structures such as categories, patterns, and properties. Use structures to solve problems and answer questions.
MP8 Look for and express regularity in repeated reasoning. Create and justify rules, shortcuts, and generalizations.

Technology Standard(s) Number and Description

TECH.8.1.5 - [Standard] - All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.5.B - [Strand] - Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.5.C - [Strand] - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.5.E - [Strand] - Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.5.F - [Strand] - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
TECH.8.2.5.E - [Strand] - Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

Interdisciplinary Standard(s) Number and Description

LA.4.RI.4.7 - [Progress Indicator] - Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.
LA.4.W.4.2 - [Progress Indicator] - Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
LA.4.W.4.2.D - Use precise language and domain-specific vocabulary to inform about or explain the topic.
LA.4.W.4.4 - [Progress Indicator] - Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
LA.4.SL.4.1 - [Progress Indicator] - 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.
SCI.3-4.5.1.4.B - [Strand] - Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.
SCI.3-4.5.1.4.D - [Strand] - The growth of scientific knowledge involves critique and communication, which are social practices that are governed by a core set of values and norms.

Enduring Understandings: The focus of this unit is the understanding of place value when solving multi-digit arithmetic with multiplication and division.

- Multiplication and division are inverse operations.
- A whole number is a multiple of each of its factors.
- Understanding place value and properties of operations is necessary to perform multi-digit multiplication and division.
- There are three different structures for multiplication and division problems: area/array, equal groups, and comparison, and the unknown quantity in multiplication and division situations is represented in three ways: unknown products, group size unknown, and number of groups unknown.
- Some division situations will produce a remainder, but the remainder should always be less than the divisor. If the remainder is greater than the divisor that means at least one more can be given to each group or at least one more group of the given size may be created. When using division to solve word problems, how the remainder is interpreted depends on the problem situation.

Students will understand that…

They can apply the basic principles of multi-digit multiplication by focusing on extending multiplication skills.

They can utilize the relationship between multiplication and division by developing a method for dividing whole numbers and solving division word problems.

Essential Questions :

How can patterns and properties be used to find some multiplication facts?
How are multiplication and division related?
How can unknown multiplication facts be found by breaking them apart into known facts?
How can unknown division facts be found by thinking about related multiplication facts?
What are efficient methods for finding products and quotients and how can place value properties aid computation?
How do I determine the factors of a number?
What is the difference between a prime and composite number?
How are factors and multiples related?
How can my understanding of place value explain the process of multiplication?
How can products be estimated?
What real-life situations require the use of multiplication and division?
How are dividends, divisors, quotients, and remainders related?
How can the remainder affect the answer in a division word problem?

21st Century Connections:

Check all that apply.

21st Century Interdisciplinary Themes

X	**Global Awareness**
	Environmental Literacy
	Health Literacy
	Civic Literacy
X	**Financial, Economic , Business and Entrepreneurial Literacy**

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, and/or **A**-Assessed in this unit by marking **E, T, A** in the box before the appropriate skill*

21st Century Skills

E T A	**Critical Thinking and Problem Solving**
E T A	**Creativity and Innovation**
E T	**Communication and Collaboration**
E	**Flexibility and Adaptability**
E T	**Initiative and Self-Direction**
E	**Social and Cross-Cultural Skills**
E T A	**Productivity and Accountability**
E T	**Leadership and Responsibility**
E T A	**Informational Literacy Skills**

E	**Media Literacy Skills**
E	**Information, Communication, and Technology (ICT) Literacy**

Career Ready Practices:

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.*

E	**CRP1. Act as a responsible and contributing citizen and employee**
E T A	**CRP2. Apply appropriate academic and technical skills**
E	**CRP3. Attend to personal health and financial well-being**
E T A	**CRP4. Communicate clearly and effectively with reason**
E	**CRP5. Consider the environmental, social and economic impacts of decisions**
E T A	**CRP6. Demonstrate creativity and innovation**
E T	**CRP7. Employ valid and reliable research strategies**
E T A	**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them**
E	**CRP9. Model integrity, ethical leadership, and effective management**
	CRP10. Plan education and career paths aligned to personal goals
E	**CRP11. Use technology to enhance productivity**
E	**CRP12. Work productively in teams while using cultural global competence**

Student Learning Goals/Objectives:

Students will know….	***Students will be able to (do)…***
1. To write multiplication equations from multiplicative comparisons given in words and describe a multiplication equation in words. 2. To multiply or divide to solve word problems involving	1. For example 35 is 5 times as many as 7 and 7 times as many as 5. 2. Illustrate and use mathematical language to explain the calculations using equations, rectangular arrays and area models. 3. Show the factors for a whole number using interactive games and/

multiplicative comparisons. 3. To locate all factors for a whole number up to 100 and determine whether it is a multiple of a given 1 digit whole number. 4. To compose equations from information supplied in word problems with multiplication and division using letters to represent unknowns. 5. To utilize strategies to multiply multi-digit number and explain the answer using equations, rectangular arrays, and area models up to 4 digits by 1 digit or two digits by two digits. 6. To utilize strategies to divide multi-digit dividends by one digit divisors and explain the answer using equations, rectangular arrays, and area models.	or working in partners on white boards. 4. Solve multiplication and division problems using the traditional method with grid paper or white boards as needed.
Key Vocabulary and Terms:	
Algorithm (a step by step procedure to solve a particular type of problem) Divisor (the number by which another number is divided) Quotient (the result of division) Arrays (a set of numbers or objects that follow a specific pattern) Factors (numbers that can be multiplied together to get a product) Product (the result of multiplication) Prime number (having whole number factors of only one and itself) Composite number (Having three or more whole number factors) Equation (a statement that the values of two mathematical expressions are equal using the = sign) Rectangular array (an arrangement of a set of objects into rows and column) Multiples (product of a given number and any other whole number)	
Assessment Evidence:	
Performance Tasks: Solving word problems	**Other Assessment Measures:** Summative

Base ten blocks Timed multiplication facts quiz Multiplication number grid Algorithms for multiplication and division https://prc.parcconline.org/assessments/parcc-released-items http://www.insidemathematics.org/performance-assessment-tasks http://ccssmathactivities.com/performance-tasks-grade-4/ http://www.ccsstoolbox.com/	Quizzes Unit Test Diagnostic Assessments Formative Slate Assessments Entry/Exit Slips Progress Monitoring Class work/ Homework Guided Practice Open Response Assessments

Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)	
*Instructional Strategies and Activities (add rows as needed) *D* **Title**	***Consider how will the design will:*** **Description with Modifications, number of days, etc.**
10. Using the U.S traditional method for multiplication	Using slates, whiteboards, or grid paper students will solve basic multiplication facts and multi-digit multiplication problems ***D** On graph paper, align the digits to solve the problems. 25 Days • Providing step by step prompts • Repeated practice • Individual/ Small Group/ Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers • Breaking down the task
11. Using the U.S. traditional method for division	Using slates, whiteboards, or grid paper students will solve division problems using one digit divisors and up to four digit dividends. ***D** On graph paper, align the digits to solve the problems. Students are taught a mnemonic device to assist in remembering the steps. (**D**oes **M**cDonalds **S**ell **C**heese **B**urgers) 25 Days

	• Providing step by step prompts • Repeated practice • Individual/ Small Group/ Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers • Breaking down the task
12. Multiplication/ Division Games	Students practice multiplication and division facts using game cards, dice, and base ten cubes. ***D** Pair students into heterogeneous groups. (Games-Number Top It, Multiplication Baseball, Factor Captor, Division Arrays, Beat the Calculator) Use periodically throughout multiplication and division unit: • Repeated practice • Providing step by step directions • Breaking down the task • Modeling • Peer Tutoring • Individual/ Small Group/ Whole Class Instruction
Resources:	
District Approved Textbook, http://eurekamathhelp.piqua.org/student-math-resources/fourth-grade-resources https://www.engageny.org/resource/grade-4-mathematics http://www.insidemathematics.org/assets/problems-of-the-month/miles%20of%20tiles.pdf	
Suggested Time Frame(Days):	50 Days

**D*– Indicates differentiation at the Lesson Level (Identify Modifications for ELL, Gifted and Talented, Basic Skills, Special Education)

Content Area:	Math	Grade(s) 4
Unit Plan Title:	Unit Three: Fractions and Decimals	

Overview/Rationale

Students build on their Grade 3 work with unit fractions as they explore fraction equivalence and extend this understanding to mixed numbers. This leads to the comparison of fractions and mixed numbers and the representation of both in a variety of models. They extend their understanding of fractions to decimals, comparing and ordering decimals using the same methods as for comparing fractions. Students apply what they know to be true for whole number operations to the new concepts of fraction, decimal and mixed number operations. They solve word problems involving addition, subtraction and multiplication of fractions, decimals, and mixed numbers.

Standard(s)Number and Description

4.4.NF.A.1 - [Standard] - 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.
4.4.NF.A.2 - [Standard] - 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.
4.4.NF.B.3a - Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
4.4.NF.B.3b - 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.
4.4.NF.B.3c - 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.
4.4.NF.B.3d - 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.
4.4.NF.B.4a - Understand a fraction a/b as a multiple of 1/b.
4.4.NF.B.4b - Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number.
4.4. NF.B.4c - 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.
4.4. NF.C.5 - [Standard] - 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.
4.4. NF.C.6 - [Standard] - Use decimal notation for fractions with denominators 10 or 100.
4.4. NF.C.7 - [Standard] - 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.

Math Practice Standards Number and Description

MP1 Make sense of problems and persevere in solving them. Make sense of your problem. Reflect on your thinking as you solve your problem. Keep trying when your problem is hard. Check whether your answer makes sense. Solve problems in more than one way. Compare the strategies you and others use.
MP2 Reason abstractly and quantitatively. Create mathematical representations using numbers, words, pictures, symbols, gestures, tables, graphs and concrete objects. Make sense of the representations you and others use. Make connections between representations.
MP3 Construct viable argument and critique the reasoning of others. Make mathematical conjectures and arguments.
MP4 Model with mathematics Model real-world situations using graphs, drawings, tables, symbols, numbers, diagram, and other representations. Use mathematical models to solve problems and answer questions.
MP5 Use appropriate tools strategically. Choose appropriate tools. Use tools effectively and make sense of your results.
MP6 Attend to precision. Explain your mathematical thinking clearly and precisely. Use an appropriate level of precision for your problem. Use clear labels, units, and mathematical language. Think about accuracy and efficiency when you count measure and calculate.
MP7 Look for and make use of structure. Look for mathematical structures such as categories, patterns, and properties. Use structures to solve problems and answer questions.
MP8 Look for and express regularity in repeated reasoning. Create and justify rules, shortcuts, and generalizations.

Technology Standard(s)Number and Description

TECH.8.1.5 - [Standard] - All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.5.B - [Strand] - Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.5.C - [Strand] - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.5.E - [Strand] - Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.5.F - [Strand] - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
TECH.8.2.5.E - [Strand] - Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

Interdisciplinary Standard(s)Number and Description

LA.4.RI.4.7 - [Progress Indicator] - Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.
LA.4.W.4.2 - [Progress Indicator] - Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
LA.4.W.4.2.D - Use precise language and domain-specific vocabulary to inform about or explain the topic.
LA.4.W.4.4 - [Progress Indicator] - Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

LA.4.SL.4.1 - [Progress Indicator] - 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.
SCI.3-4.5.1.4.B - [Strand] - Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.
SCI.3-4.5.1.4.D - [Strand] - The growth of scientific knowledge involves critique and communication, which are social practices that are governed by a core set of values and norms.

Enduring Understandings:

The focus of this unit is on understanding and ordering fractions and their equivalence; adding, subtracting, and multiplying fractions and mixed numbers; solving word problems with fractions, and understanding how fractions and decimal notation compare.

- Use comparing, ordering, and equivalent fractions to extend understanding of fractions.
- Fractions can be represented visually and in written form.
- Comparisons are only valid when the two fractions refer to the same whole.
- Fractions and mixed numbers are composed of unit fractions and can be decomposed as a sum of unit fractions.
- Improper fractions and mixed numbers express the same value.
- Using students' previous knowledge of the properties of whole numbers in addition and subtraction will aid in teaching of addition and subtraction of fractions.
- Addition and subtraction of fractions involves joining and separating parts referring to the same whole.
- Multiplying a fraction by a whole number is a logical step after multiplication of whole numbers.
- A product of a fraction times a whole number can be written as a multiple of a unit fraction.
- Decimal notation is another way to represent a fraction.
- Fractions with denominators of 10 can be expressed as an equivalent fraction with a denominator of 100.
- Fractions with denominators of 10 and 100 may be expressed when using decimal notation.
- When comparing two decimals to hundredths, the comparisons are only valid if they refer to the same whole.

Students will understand that…

They can utilize the relationship between fractions and/or decimals, to find the equivalence, order, and their comparison.
They can identify the whole in fractions and apply to adding and subtracting fractions and mixed numbers.
They can formulize their understanding of multiplying a fraction by a whole number and use this knowledge to solve problems in real-world scenarios.

Essential Questions :

- How do finding equivalent fractions help us compare?

- How are fractions used in problem-solving situations?
- How are fractions composed, decomposed, compared and represented?
- Why is it important to identify, label, and compare fractions as representations of equal parts of a whole or of a set?
- How can the same fractional amount be named in different ways using symbols?
- How can fractions be compared and ordered?
- Why does the numerator change, but the denominator stay the same when adding and subtracting fractions with like denominators?
- What does it mean to add and subtract fractions and mixed numbers with like denominators?
- What is a standard procedure for adding and subtracting mixed numbers with like denominators?
- How can fractions and mixed numbers be added and subtracted on a number line?
- How/why does the whole number become smaller when you multiply a whole number by a fraction?
- How can multiplying a whole number by a fraction be displayed as repeated addition (as a multiple of a unit fraction)?
- How can a fraction be represented by a decimal?
- How can visual models be used to help with understanding decimals?
- How can visual models be used to determine and compare equivalent fractions and decimals?
- How would we compare and order decimals through hundredths?
- How is decimal numeration related to whole number numeration?

21st Century Connections

Check all that apply.

21st Century Interdisciplinary Themes

X	**Global Awareness**
	Environmental Literacy
	Health Literacy
	Civic Literacy
X	**Financial, Economic , Business and Entrepreneurial Literacy**

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, and/or **A**-Assessed in this unit by marking **E, T, A** in the box before the appropriate skill*

21st Century Skills

E T A	**Critical Thinking and Problem Solving**
E T A	**Creativity and Innovation**
E T	**Communication and Collaboration**
E T	**Flexibility and Adaptability**
E T	**Initiative and Self-Direction**
E T	**Social and Cross-Cultural Skills**
E T A	**Productivity and Accountability**
E T	**Leadership and Responsibility**

E T A	**Informational Literacy Skills**
E	**Media Literacy Skills**
E	**Information, Communication, and Technology (ICT) Literacy**

Career Ready Practices:

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.*

E	**CRP1. Act as a responsible and contributing citizen and employee**
E T A	**CRP2. Apply appropriate academic and technical skills**
E	**CRP3. Attend to personal health and financial well-being**
E T A	**CRP4. Communicate clearly and effectively with reason**
E	**CRP5. Consider the environmental, social and economic impacts of decisions**
E T A	**CRP6. Demonstrate creativity and innovation**
E	**CRP7. Employ valid and reliable research strategies**
E T A	**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them**
E	**CRP9. Model integrity, ethical leadership, and effective management**
	CRP10. Plan education and career paths aligned to personal goals
	CRP11. Use technology to enhance productivity
E	**CRP12. Work productively in teams while using cultural global competence**

Student Learning Goals/Objectives:

Students will know….	***Students will be able to (do)…***
1. To explain why a fraction is equivalent to another fraction. 2. To compare two fractions with different numerators and denominators, and record the results of comparisons with symbols >, =, or < and justify the conclusions.	1. For example a fraction a/b is equivalent to a fraction (n*a)/ (n*b) by using visual fraction models. 2. Create common denominators or numerators, or by comparing to a benchmark fraction such as ½.

3. To understand addition and subtraction of fractions is joining and separating parts referring to the same whole. 4. To decompose a fraction into a sum of fractions with the same denominator in more than one way. 5. To add and subtract mixed numbers with like denominators. 6. To understand a fraction a/b as a multiple of 1/b. 7. To understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. 8. To 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. 9. To use decimal notation for fractions with denominators 10 or 100. 10. To 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 <.	3. Justify decompositions by using a visual fraction model: for example 3/8 =1/8 +1/8+1/8, 3/8 =1/8 +2/8 4. For example replace each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction. 5. Use a visual fraction model to represent 5/4 as the product 5 times ¼ recording the conclusion by the equation 5/4 = 5*1/4. 6. Use a visual fraction model to express 3* (2/5) as 6 * (1/5) recognizing this product as 6/5. 7. Express 3/10 as 30/100 and add 3/10 + 4/100 =34/100 8. Rewrite 0.62 as 62/100.

Key Vocabulary and Terms:

- Benchmark (standard or reference point by which something is measured)
- Common denominator (when two or more fractions have the same denominator)
- Denominator (e.g., the 5 in $\frac{3}{5}$ names the fractional unit as fifths)
- Fraction greater than 1 (a fraction with a numerator that is greater than the denominator)
- Mixed number (number made up of a whole number and a fraction)
- Numerator (e.g., the 3 in $\frac{3}{5}$ indicates 3 fractional units are selected
- =, <, > (equal to, less than, greater than)
- Compose (change a smaller unit for an equivalent of a larger unit, e.g., 2 fourths = 1 half, 10 ones = 1 ten; combining 2 or more numbers, e.g., 1 fourth + 1 fourth = 2 fourths, 2 + 2 + 1 = 5)
- Decompose (change a larger unit for an equivalent of a smaller unit, e.g., 1 half = 2 fourths, 1 ten = 10 ones; partition a number into 2 or more parts, e.g., 2 fourths = 1 fourth + 1 fourth, 5 = 2 + 2 + 1)
- Equivalent fractions (fractions that name the same size or amount)
- Unit fraction (fractions with numerator 1)

- Tenths (a place value unit such that 10 tenths equals 1 one)
- Hundredths (A place value unit such that 100 hundredths equals 1 one)
- Whole (an entire object, collection of objects, or quantity being considered in a problem situation, 100%.

Assessment Evidence:

Performance Tasks:	**Other Assessment Measures*:***
Base Ten blocks Fraction Circles Comparing decimals, fractions (<,>, or =) Hundred Grids Make fraction strips Number line comparisons with fractions and decimals https://prc.parcconline.org/assessments/parcc-released-items http://www.insidemathematics.org/performance-assessment-tasks http://ccssmathactivities.com/performance-tasks-grade-4/ http://www.ccsstoolbox.com/ (PARCC Prototype Tasks)	Summative • Quizzes • Unit Test • Diagnostic Assessments Formative • Slate Assessments • Entry/Exit Slips • Progress Monitoring • Class work/ Homework • Guided Practice • Open Response Assessments

Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)

*Instructional Strategies and Activities (add rows as needed) *D* **Title**	***Consider how will the design will:*** **Description with Modifications, number of days, etc.**
13. Using fractions and/or decimals to show equivalency, comparison, and order.	Using fraction strips, number lines, fraction circles, and base ten blocks, students will solve problems to determine fraction and/or decimal equivalency, comparison, and order. *D Using base-10 blocks and hundred grid for hands –on instruction. 30 Days • Providing step by step prompts • Repeated practice • Individual/ Small Group/ Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers • Breaking down the task

14. Using addition and subtraction of fractions, mixed numbers, and decimals.	Using slates, whiteboards, or grid paper, students will solve addition and subtraction problems with fractions, mixed numbers, and decimals. *D On graph paper, align the whole numbers and fractions to solve the problems. Use fraction circles and/or draw pictures to model the problem. 20 Days • Providing step by step prompts • Repeated practice • Individual/ Small Group/ Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers • Breaking down the task
15. Using multiplication of a fraction and a whole number.	Using slates, whiteboards, or grid paper, students will solve multiplication of a fraction and a whole number. *D Use skip counting by a unit fraction, and/or using a number line to find multiples of unit fractions. 10 Days • Providing step by step prompts • Repeated practice • Individual/ Small Group/ Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers • Breaking down the task
Resources:	
District Approved Textbook, http://eurekamathhelp.piqua.org/student-math-resources/fourth-grade-resources https://www.engageny.org/resource/grade-4-mathematics http://www.insidemathematics.org/assets/problems-of-the-month/miles%20of%20tiles.pdf	
Suggested Time Frame	60 Days

Content Area:	**Math**	**Grade(s) 4th Grade**
Unit Plan Title:	**Unit 4 Measurement**	

Overview/Rationale
In this unit students build a conceptual understanding of the relative sizes of units of measure within a single system of measurement. Students will combine competencies from different domains to solve measurement problems using the four operations. Measurement is included in this unit to provide a context for problem solving.
Standard(s) Number and Description
MA.4.4.MD.A.1 - [Standard] - Know relative sizes of measurement units within one system of units including km, m, cm, mm; 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. **MA.4.4.MD.A.2 - [Standard]** - Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. **MA.4.4.MD.A.3 - [Standard]** - Apply the area and perimeter formulas for rectangles in real world and mathematical problems. MA.4.4.MD.B - Represent and interpret data. **MA.4.4.MD.B.4 - [Standard]** - 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. **MA.4.4.MD.C** - Geometric measurement: understand concepts of angle and measure angles**.** **MA.4.4.MD.C.5 - [Standard] -** Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: **MA.4.4.MD.C.5a** - 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. **MA.4.4.MD.C.5b** - An angle that turns through n one-degree angles is said to have an angle measure of n degrees. **MA.4.4.MD.C.6 - [Standard] -** Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. **MA.4.4.MD.C.7 - [Standard]** - 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.
Math Practice Standards Number and Description
MP.1 Make sense of problems and persevere in solving them. Students use place value knowledge to convert larger units to smaller units before adding and subtracting. They fluently add and subtract metric units of length, weight, and capacity using the standard algorithm. Tape diagrams and number lines help students conceptualize a problem before it is solved and are used to assess the reasonableness of an answer. **MP.**7 Look for and make use of structure. Students use knowledge of place value and mixed units to find patterns when converting from a larger unit to a smaller unit. They recognize that 1 thousand equals 1,000 ones and relate that to 1 kilometer equals 1,000 meters. Using this pattern, they might

extend thinking to convert smaller to larger units when making a conversion chart.
MP.8 Look for and express regularity in repeated reasoning. Students find that metric unit conversions share a relationship on the place value chart. For example, 1,000 ones equals 1 thousand, 1,000 g equals 1 kg, 1,000 mL equals 1 L, and 1,000 m equals 1 km. Knowing and using these conversions and similarities allows for quick and easy conversion and calculation**.**

Technology Standard(s) Number and Description

TECH.8.1.5 - [Standard] - All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.5.B - [Strand] - Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.5.C - [Strand] - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.5.E - [Strand] - Students apply digital tools to gather, evaluate, and use information**.**
TECH.8.1.5.F - [Strand] - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
TECH.8.2.5.E - [Strand] - Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

Interdisciplinary Standard(s) Number and Description

LA.4.RI.4.7 - [Progress Indicator] - Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.
LA.4.W.4.2 - [Progress Indicator] - Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
LA.4.W.4.2.D - Use precise language and domain-specific vocabulary to inform about or explain the topic.
LA.4.W.4.4 - [Progress Indicator] - Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
LA.4.SL.4.1 - [Progress Indicator] - 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.
SCI.3-4.5.1.4.B - [Strand] - Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.
SCI.3-4.5.1.4.D - [Strand] - The growth of scientific knowledge involves critique and communication, which are social practices that are governed by a core set of values and norms.

Enduring Understandings:

Students will understand in order to…

• Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
• Represent and interpret data.
• Geometric measurement: understand concepts of angle and measure angles.

Essential Questions :

- What are customary units of length?
- What are metric units?
- How can I change large measurement units into smaller measurement units?
- How can I use diagram to represent an answer to a measurement word problem?
- How is time measured?
- How can I measure perimeter?
- How can I measure area?
- How can we use various strategies to solve a word problem?
- How do we correctly select which unit of measurement to use?

21st Century Connections

Check all that apply.

21st Century Interdisciplinary Themes

X	**Global Awareness**
	Environmental Literacy
	Health Literacy
	Civic Literacy
	Financial, Economic , Business and Entrepreneurial Literacy

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, and/or **A**-Assessed in this unit by marking **E, T, A** in the box before the appropriate skill*

21st Century Skills

ETA	**Critical Thinking and Problem Solving**
ETA	**Creativity and Innovation**
ETA	**Communication and Collaboration**
E	**Flexibility and Adaptability**
ET	**Initiative and Self-Direction**
E	**Social and Cross-Cultural Skills**
ETA	**Productivity and Accountability**
ET	**Leadership and Responsibility**
ETA	**Informational Literacy Skills**

E	**Media Literacy Skills**
E	**Information, Communication, and Technology (ICT) Literacy**

Career Ready Practices:

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.*

E	**CRP1. Act as a responsible and contributing citizen and employee**
E	**CRP2. Apply appropriate academic and technical skills**
	CRP3. Attend to personal health and financial well-being
ETA	**CRP4. Communicate clearly and effectively with reason**
	CRP5. Consider the environmental, social and economic impacts of decisions
ET	**CRP6. Demonstrate creativity and innovation**
E	**CRP7. Employ valid and reliable research strategies**
ETA	**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them**
	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals
	CRP11. Use technology to enhance productivity
E	**CRP12. Work productively in teams while using cultural global competence**

Student Learning Goals/Objectives:

Students will know….	***Students will be able to (do)…***
• Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. • Represent and interpret data. • Geometric measurement: understand concepts of angle and	- Know relative sizes of measurement units within one system of units including km, m, cm, mm; 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. - Use the four operations to solve word problems involving distances,

measure angles.	intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. - Apply the area and perimeter formulas for rectangles in real world and mathematical problems. - Represent and interpret data. - 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. - Understand geometric measurement using concepts of angle and measure angles. - Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: - 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. - An angle that turns through one-degree angles is said to have an angle measure of n degrees. - Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. - 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.

Key Vocabulary and Terms:

=, <, > (equal to, less than, greater than)
Algorithm (a step-by-step procedure to solve a particular type of problem)
Capacity (the maximum amount that something can contain)
Distance (the length of the line segment joining two points)
Equivalent (equal)
Kilogram (kg), gram (g) (units of measure for mass)
Larger or smaller unit (used in a comparison of units)
Length (the measurement of something from end to end)
Liter (L), milliliter (ml) (unit of measure for liquid volume)
Measurement (dimensions, quantity, or capacity as determined by comparison with a standard)
Meter (m), centimeter (cm) (units of measure for length)
Mixed units (e.g., 2 tens 4 ones, 2 kilometers 34 meters)
Simplifying strategy (a mental math or recorded method for making a problem easier to solve)
Table (used to represent data
Times as much as (e.g., 1 hundred is 10 times as much as 1 ten)
Units of Time: sec., min., hr.
Weight (the measurement of how heavy something is)

Assessment Evidence:

Performance Tasks:	**Other Assessment Measures*:***
Gallon Man Who's the Tallest? https://www.illustrativemathematics.org/content-standards/tasks/1931 Solving word problems Liquid Volume Containers "Judy Clocks"	Summative • Quizzes • Unit Test • Diagnostic Assessments Formative • Slate Assessments

Incorporate actual performance assessments as well with rubrics. Some websites have ideas if not currently used: https://prc.parcconline.org/assessments/parcc-released-items http://www.insidemathematics.org/performance-assessment-tasks http://ccssmathactivities.com/performance-tasks-grade-4/ http://www.ccsstoolbox.com/ (PARCC Prototype Tasks)	• Entry/Exit Slips • Progress Monitoring • Classwork/ Homework • Guided Practice • Open Response Assessments ***Include Benchmarks***
Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)	
Instructional Strategies and Activities (add rows as needed) **Title**	***Consider how will the design will:*** **Description with Modifications, number of days, etc.**
16. Capacity	*D Teacher models and helps with • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
17. Linear	*D Teacher models and helps with • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers

18. Weight	*D Teacher models and helps with • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
19. Time	*D Teacher models and helps with • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
Resources:	
District Approved Textbook, http://eurekamathhelp.piqua.org/student-math-resources/fourth-grade-resources https://www.engageny.org/resource/grade-4-mathematics http://www.insidemathematics.org/assets/problems-of-the-month/miles%20of%20tiles.pdf	
Suggested Time Frame	15-20 days

**D* – Indicates differentiation at the Lesson Level (Identify Modifications for ELL, Gifted and Talented, Basic Skills, Special Education)

Content Area:	**Math**	**Grade(s) 4th**
Unit Plan Title:	**Unit 5 - Geometry**	
Overview/Rationale		
Students will learn that lines, angles and shapes can be analyzed, described, and classified based on their properties, such as having parallel sides, perpendicular sides, particular angles measures, and line symmetry. Students will be able to identify, estimate, draw and measure		

angles in whole-number degrees using a protractor. Students will be able to construct lines of symmetry for a two-dimensional figures.

Standard(s) Number and Description

MA.4.4.G.A - Draw and identify lines and angles, and classify shapes by properties of their lines and angles.
MA.4.4.G.A.1 - [Standard] - Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
MA.4.4.G.A.2 - [Standard] - 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.
MA.4.4.G.A.3 - [Standard] - 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.
MA.4.4.MD.C.5 - [Standard] - Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:
MA.4.4.MD.C.5a - 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.
MA.4.4.MD.C.5b - An angle that turns through n one-degree angles is said to have an angle measure of n degrees.
MA.4.4.MD.C.6 - [Standard] - Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
MA.4.4.MD.C.7 - [Standard] - 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.

Math Practice Standards Number and Description

MP1 Make sense of problems and persevere in solving them. Make sense of your problem. Reflect on your thinking as you solve your problem. Keep trying when your problem is hard. Check whether your answer makes sense. Solve problems in more than one way. Compare the strategies you and others use.
MP2 Reason abstractly and quantitatively. Create mathematical representations using numbers, words, pictures, symbols, gestures, tables, graphs and concrete objects. Make sense of the representations you and others use. Make connections between representations.
MP3 Construct viable argument and critique the reasoning of others. Make mathematical conjectures and arguments.
MP4 Model with mathematics Model real-world situations using graphs, drawings, tables, symbols, numbers, diagram, and other representations. Use mathematical models to solve problems and answer questions.
MP5 Use appropriate tools strategically. Choose appropriate tools. Use tools effectively and make sense of your results.
MP6 Attend to precision. Explain your mathematical thinking clearly and precisely. Use an appropriate level of precision for your problem. Use clear labels, units, and mathematical language. Think about accuracy and efficiency when you count measure and calculate.
MP7 Look for and make use of structure. Look for mathematical structures such as categories, patterns, and properties. Use structures to solve problems and answer questions.

MP8 Create and justify rules, shortcuts, generalizations.

Technology Standard(s) Number and Description

TECH.8.1.5 - [Standard] - All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.5.B - [Strand] - Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.5.C - [Strand] - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.5.E - [Strand] - Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.5.F - [Strand] - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
TECH.8.2.5.E - [Strand] - Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

Interdisciplinary Standard(s) Number and Description

LA.4.RI.4.7 - [Progress Indicator] - Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.
LA.4.W.4.2 - [Progress Indicator] - Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
LA.4.W.4.2.D - Use precise language and domain-specific vocabulary to inform about or explain the topic.
LA.4.W.4.4 - [Progress Indicator] - Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
LA.4.SL.4.1 - [Progress Indicator] - 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.
SCI.3-4.5.1.4.B - [Strand] - Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.
SCI.3-4.5.1.4.D - [Strand] - The growth of scientific knowledge involves critique and communication, which are social practices that are governed by a

Enduring Understandings:

Students will understand that…

- Line segments and rays are sets of points that describe parts of lines, shapes and solids.
- Angles are formed by two intersecting lines or by rays with a common endpoint and are classified by shape.

- Angles can be classified by the fraction of the circle cut off by its rays.
- Polygons can be described and classified by their sides and angles.
- The best way to measure an angle is to use a mathematical tool called a protractor. The angle is measured by noting where the second ray intersects the arc of the protractor.

Essential Questions :

- How can lines, angles, and shapes be described, analyzed, and classified?
- How are angles measured?
- How can spatial relationships be described by careful use of geometric language?
- How do geometric relationships help us to solve problems and/or make sense of phenomena?
- How can geometric measurements be used to solve problems?

21st Century Connections

Check all that apply.

21st Century Interdisciplinary Themes

X	**Global Awareness**
	Environmental Literacy
	Health Literacy
	Civic Literacy
	Financial, Economic , Business and Entrepreneurial Literacy

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, and/or **A**-Assessed in this unit by marking **E, T, A** in the box before the appropriate skill*

21st Century Skills

ETA	**Critical Thinking and Problem Solving**
ETA	**Creativity and Innovation**
E	**Communication and Collaboration**
ET	**Flexibility and Adaptability**
ET	**Initiative and Self-Direction**
E	**Social and Cross-Cultural Skills**
ETA	**Productivity and Accountability**
ET	**Leadership and Responsibility**
ETA	**Informational Literacy Skills**
E	**Media Literacy Skills**
E	**Information, Communication, and Technology (ICT) Literacy**

Career Ready Practices:	
*Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.*	
E	**CRP1. Act as a responsible and contributing citizen and employee**
E	**CRP2. Apply appropriate academic and technical skills**
	CRP3. Attend to personal health and financial well-being
ETA	**CRP4. Communicate clearly and effectively with reason**
ET	**CRP5. Consider the environmental, social and economic impacts of decisions**
E	**CRP6. Demonstrate creativity and innovation**
ETA	**CRP7. Employ valid and reliable research strategies**
	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals
	CRP11. Use technology to enhance productivity
E	**CRP12. Work productively in teams while using cultural global competence**

Student Learning Goals/Objectives:

Students will know….	***Students will be able to (do)…***
•Line segments and rays are sets of points that describe parts of lines, shapes and solids. •Angles are formed by two intersecting lines or by rays with a common endpoint and are classified by shape. •Angles can be classified by the fraction of the circle cut off by its rays. •Polygons can be described and classified by their sides and angles. •The best way to measure an angle is to use a mathematical tool called a protractor. The angle is measured by noting where the second	- Draw and identify lines and angles, and classify shapes by properties of their lines and angles. - Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. - 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.

ray intersects the arc of the protractor.	- 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. - Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: - 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. - An angle that turns through n one-degree angles is said to have an angle measure of n degrees. - Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. - 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.
Key Vocabulary and Terms:	
point, line, parallel lines, intersecting lines, perpendicular lines, line segment, ray, angle, right angle, acute angle, obtuse angle, straight angle, degree, angle measure, protractor, polygon, side, vertex, triangle, quadrilateral, pentagon, hexagon, octagon, equilateral triangle, right triangle, rhombus, trapezoid, parallelogram, rectangle, square, symmetric, line of symmetry	
Assessment Evidence:	
Performance Tasks: • **Clock angles** • **Quilt patterns**	**Other Assessment Measures*:*** *Summative* • *Quizzes*

• **Sorting quadrilaterals** • **Polygon capture** • **Tangrams** • **Fraction circle comparisons**	• *Unit Test* • *Diagnostic Assessments* *Formative* • *Slate Assessments* • *Entry/Exit Slips* • *Progress Monitoring* • *Classwork/ Homework* • *Guided Practice* • *Open Response Assessments* **Include Benchmarks*

Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)	
Instructional Strategies and Activities (add rows as needed) **D* **Title**	***Consider how will the design will:*** **Description with Modifications, number of days, etc.**
20. Identify polygons and their attributes	*D Teacher models and helps with • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
21. Identify and Measure Angles	*D Teacher models and helps with • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling

	• Graphic Organizers
22. Construct lines of geometry for 2 dimensional figures	*D Teacher models and helps with • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
23. Identify Symmetry in polygons	*D Teacher models and helps with • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
Resources:	
District Approved Textbook, http://eurekamathhelp.piqua.org/student-math-resources/fourth-grade-resources https://www.engageny.org/resource/grade-4-mathematics http://www.insidemathematics.org/assets/problems-of-the-month/miles%20of%20tiles.pdf	
Suggested Time Frame	14-16 days

**D* – Indicates differentiation at the Lesson Level (Identify Modifications for ELL, Gifted and Talented, Basic Skills, Special Education)

Curriculum Map- 4th Grade Mathematics

Grade 4		Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
4. OA - Operations & Algebraic Thinking						
E. Use the four operations with whole numbers to solve problems.						
4.0A.1	Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 x 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.		✔			
4.0A.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.		✔			
4.0A.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.		✔			
F. Gain familiarity with factors and multiples.						
4.0A.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.		✔			
G. Generate and analyze patterns.						
4.0A.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.*		✔			
4. NBT - Number & Operations in Base Ten						
A. Generalize place value understanding for multi-digit whole numbers.						

4.NBT.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.*	✔				
4.NBT.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.	✔				
4.NBT.3	Use place value understanding to round multi-digit whole numbers to any place.	✔				
B.	**Use place value understanding and properties of operations to perform multi-digit arithmetic**					
4.NBT.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm.	✔				
4.NBT.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.		✔			
4.NBT.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.		✔			
4. NF - Number & Operations — Fractions						
E.	**Extend understanding of fraction equivalence and ordering.**					
4.NF.1	Explain why a fraction *a/ b* is equivalent to a fraction *(n x a)/(n x 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.			✔		

4.NF.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 e, and justify the conclusions, e.g., by using a visual fraction model.			✔		
F.	**Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.**					
4.NF.3	Understand a fraction alb with a > 1 as a sum of fractions 1/b. 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.			✔		
4.NF.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 x (1/4), recording the conclusion by the equation 5/4 = 5 x (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 x (2/5) as 6 x (1/5),			✔		

	recognizing this product as 6/5. (In general, n x (a/b) = (n x 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?					
G. Understand decimal notation for fractions, and compare decimal fractions.						
4.NF.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.*			✔		
4.NF.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.*			✔		
4.NF.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.			✔		
4. MD - Measurement and Data						
B. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.						
4.MD.1	Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; Ib, oz.; I, 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), ...*				✔	

4.MD.2	Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.				✔	
4.MD.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.*				✔	
C. Represent and interpret data.						
4.MD.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.				✔	
D. Geometric measurement: understand concepts of angle and measure angles.						
4.MD.5	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.				✔	✔
E. Geometric measurement: understand concepts of angle and measure angles.						

4.MD.6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.				✔	✔
4.MD.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.				✔	✔
4. G - Geometry						
A.	**Draw and identify lines and angles, and classify shapes by properties of their lines and angles.**					
4.G.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.					✔
4.G.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.					✔
4.G.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.					✔

5th GRADE MATH CURRICULUM

Middle Township Public Schools
216 S. Main Street
Cape May Court House, NJ 08210

Table of Contents

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Introduction

This document serves to meet all requirements for curriculum as per the Middle Township Board of Education and the New Jersey Department of Education and will serve as a guide for lesson planning. Units within the curricular framework for mathematics are designed to be taught in the order in which they are presented. There is a logical and developmentally appropriate progression of standards, with strong consideration given to Major, Supporting, and Additional content standards presented since most concepts build upon each other. Within Supporting and Additional clusters of mathematics content standards are based on the New Jersey Student Learning Standards. Suggested Mathematical Practice Standards are listed in each unit to be imbedded regularly in daily math instruction.

Course Description

The principles for school mathematics address the overarching themes of equity, curriculum, teaching, learning, assessment and technology. (NCTM, 2000)

Equity: Excellence in mathematics education requires equity – high expectations, worthwhile opportunities, accommodation for differences, resources, and strong support for all students.

Curriculum: A coherent curriculum effectively organizes standards and mathematical ideas, focuses on important mathematics, and is well articulated within and across grades.

Teaching: Effective standards-aligned mathematics instruction is a complex endeavor that requires understanding what students know and need to learn, and then challenging and supporting them to learn it well. Effective teaching requires continually seeking improvement.

Learning: Conceptual understanding is an important component of proficiency. Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge. Learning with understanding is essential to enable students to solve the new kinds of problems they will inevitably face in the future.

Assessment: Standards-aligned assessment, a routine part of ongoing classroom activity, should enhance students' learning and inform instructional decisions.

Technology: Technology, not to be used as a replacement for basic understandings and intuitions, is an essential tool in teaching and learning mathematics; it influences the mathematics that is taught, supports visualization, facilitates organizing and analyzing data, and offers efficient computation.

In Grade 5, instructional time should focus on three critical areas: (1) developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions); (2) extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations; and (3) developing understanding of volume.

Pacing Guide

Recommended Fifth Grade Mathematics Pacing Guide					
First Marking Period	**Days 1- 45**				
	September 18 days		**October 20 Days**		**November 18 days**
	Unit One: Place Values and Decimals		Unit Two: Multi-Digit Whole Numbers and Numerical Operations		
Second Marking Period	**Days 46- 90**				
	November (Continued) 18 days		**December 15 days**		**January 20 days**
	Unit Two: Continued	Unit Three: Addition and Subtraction of Fractions			Unit Four: Multiplication and Division of Fractions and Decimals
Third Marking Period	**Days 91- 135**				
	February 18 days		**March 21 days**		**April 16 days**
	Unit Four: Continued		Unit Five: Addition and Multiplication with Area and Volume		
Fourth Marking Period	**Days 136-180**				
	April (Continued) 16 days		**May 22 days**		**June 12 days**
	Unit Five: Continued	Unit Six- Problem Solving with the Coordinate Plane			

Pacing Guide

UNIT TITLE	ENDURING UNDERSTANDINGS	NJSLS	TIMEFRAME
9- Place Values and Decimals	• The number system is based on a well-defined system. • Every numerical operation has an inverse. • Computational fluency requires efficient, accurate and flexible methods for computing. • Rational numbers can be represented in multiple ways. • In a multi-digit number, a number in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. • Multiplying by a power of 10 shifts the digits of a whole number or decimal that many places to the left. The exponent not only indicates how many places the decimal is moving, but also that you are multiplying or making the number 10 times greater, three times, when you multiply 10	**MA.5.5.NBT.A.1** **MA.5.5.NBT.A.2** **MA.5.5.NBT.A.3a** **MA.5.5.NBT.A.3b** **MA.5.5.NBT.A.4** **MA.5.5.NBT.B.7** **MA.5.5.MD.A.1**	**15-20 days**
10- Multi-Digit Whole Numbers and Numerical Operations	• The number system is based on a well-defined system. • Every numerical operation has an inverse. • Computational fluency requires efficient, accurate and flexible methods for computing. • Rational numbers can be represented in multiple ways. • In a multi-digit number, a number in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. • Multiplying by a power of 10 shifts the digits of a whole number or decimal that many places to the left. The exponent not only indicates how many places the decimal is moving, but also that you are multiplying or making the number 10 times greater, three times, when you multiply 10.	**MA.5.5.OA.A.1** **MA.5.5.OA.A.2** **MA.5.5.NBT.A.1** **MA.5.5.NBT.A.2** **MA.5.5.NBT.B.5** **MA.5.5.NBT.B.6** **MA.5.5.NBT.B.7** **MA.5.5.MD.A.1**	
11- Addition and Subtraction of Fractions	• Fractions can be used to aid in explaining real world problems. • Benchmark fractions and other strategies aid in estimating the reasonableness of results with operations of fractions. • The use of area models, fraction strips, and number lines are effective	**MA.5.5.NF.A.1** **MA.5.5.NF.A.2**	**20-25 days**

	strategies to model sums and differences. • Equivalent fractions are critical when adding and subtracting fractions with unlike denominators. • Fractions are division models. • Use your knowledge of fractions and equivalence to develop algorithms for adding and subtracting.		
12- Multiplication and Division of Fractions and Decimals	• Benchmark fractions and other strategies aid in estimating the reasonableness of results with operations of fractions. • The use of area models, fraction strips, and number lines are effective strategies to model products and quotients. • Fractions are division models. • Multiplication can be interpreted as scaling/resizing. • Use your knowledge of fractions and equivalence to develop algorithms for multiplying and dividing.	**MA.5.5.OA.A.1** **MA.5.5.OA.A.2** **MA.5.5.NBT.B.7** **MA.5.5.NF.B.3** **MA.5.5.NF.B.4a** **MA.5.5.NF.B.5a** **MA.5.5.NF.B.5b** **MA.5.5.NF.B.6** **MA.5.5.NF.B.7a** **MA.5.5.NF.B.7b** **MA.5.5.NF.B.7c** **MA.5.5.MD.A.1** **MA.5.5.MD.B.2**	**30-35 days**
13- Addition and Multiplication with Area and Volume	• Area is an attribute of two-dimensional space and is measured in square units. • Multiple rectangles can have the same area. • Area can be found by adding the square units or by multiplying the two dimensions. • Volume is an attribute of three-dimensional space and is measured in cubic units. • Multiple rectangular prisms can have the same volume. • Volume can be found by repeatedly adding the area of the base or by multiplying all three dimensions. • Two-dimensional shapes can be described and classified by their properties. • Two-dimensional shapes are composed of various parts that are described with precise vocabulary.	**5.NF.B.4** **5.NF.B.4b** **5.MD.C.3a** **5.MD.C.3b** **5.MD.C.4** **5.MD.C.5a** **5.MD.C.5b** **5.MD.C.5c** **5.G.B.3** **MA.5.5.G.B.4**	**20-25 days**

14- Problem Solving with the Coordinate Plane	• The coordinate plane can be used to model and compare numerical patterns. • On the coordinate plane, a point represents the two facets of information associated with an ordered pair. • Graphical representations can be used to make predications and interpretations about real world situations. • In a coordinate plane, the first number indicates how far to travel from the origin in the direction of the x-axis and the second number indicates how far to travel in the direction of the y-axis. • The coordinate plane can be used to model and compare numerical patterns.	**MA.5.5.OA.A.2** **MA.5.5.OA.B.3** **MA.5.5.G.A.1** **MA.5.5.G.A.2**	**25-30 days**

Content Area:	Math	Grade(s): 5th Grade
Unit Plan Title:	Unit 1: Place Value and Decimals	

Overview/Rationale

In this unit, students build on their work from previous grade levels to refine their strategies for multiplication and division in order to reach fluency in multiplication by the end of the year. Students continue to develop more sophistication for division to become flexible and efficient with the standard algorithm in Grade 6. Students begin to find quotients with two-digit divisors early in the year to build strategies for accurate computation. Students will understand that in base-10, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

Standard(s) Number and Description

MA.5.5.NBT.A.1 - [*Standard*] - Recognize that in a multi--digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
MA.5.5.NBT.A.2 - [*Standard*] - Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
MA.5.5.NBT.A.3a - Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).
MA.5.5.NBT.A.3b - Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
MA.5.5.NBT.A.4 - [*Standard*] - Use place value understanding to round decimals to any place.
MA.5.5.NBT.B.7 - [*Standard*] - Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
MA.5.5.MD.A.1 - [*Standard*] - Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Math Practice Standards Number and Description

MP 1 Make sense of problems and persevere in solving them
MP 6 Attend to precision
MP 8 Look for and express regularity in repeated reasoning

Technology Standard(s) Number and Description

TECH.8.1.5 - [Standard] - All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

TECH.8.1.5.B - [Strand] - Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.5.C - [Strand] - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.5.E - [Strand] - Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.5.F - [Strand] - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
TECH.8.2.5.E - [Strand] - Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

Interdisciplinary Standard(s) Number and Description

LA.5.W.5.2.E - Provide a conclusion related to the information of explanation presented.
LA.5.SL.5.4 - [*Progress Indicator*] - Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
LA.5.SL.5.5 - [*Progress Indicator*] - Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
3-5-ETS1-1 - [*Performance Expectation*] - Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
3-5-ETS1-2 - [*Performance Expectation*] - Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
3-5-ETS1-3 - [*Performance Expectation*] - Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Enduring Understandings:

Students will understand that…
• The number system is based on a well-defined system.
• Every numerical operation has an inverse.
• Computational fluency requires efficient, accurate and flexible methods for computing.
• Rational numbers can be represented in multiple ways.
• In a multi-digit number, a number in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
• Multiplying by a power of 10 shifts the digits of a whole number or decimal that many places to the left. The exponent not only indicates how many places the decimal is moving, but also that you are multiplying or making the number 10 times greater, three times, when you multiply 10

Essential Questions :

- How does understanding the structure of the number system help you solve problems?
- How can you use the inverse of a numerical operation to help you compute an answer?
- Which mathematical skills are necessary to be fluent in computation?
- How can you represent rational numbers in multiple ways?
- What occurs when numbers are multiplied, divided, or ordered by 10 or powers of 10?
- What are the standard procedures for estimating and finding products?
- What are the standard procedures for estimating and finding quotients?

21st Century Connections

Check all that apply. **21st Century Interdisciplinary Themes**		*Indicate whether these skills are **E**-Encouraged, **T**-Taught, and/or **A**-Assessed in this unit by marking **E, T, A** in the box before the appropriate skill.* **21st Century Skills**	
X	**Global Awareness**	**ETA**	**Critical Thinking and Problem Solving**
	Environmental Literacy	**ETA**	**Creativity and Innovation**
	Health Literacy	**ETA**	**Communication and Collaboration**
	Civic Literacy	**E**	**Flexibility and Adaptability**
	Financial, Economic , Business and Entrepreneurial Literacy	**ET**	**Initiative and Self-Direction**
		E	**Social and Cross-Cultural Skills**
		ETA	**Productivity and Accountability**
		ET	**Leadership and Responsibility**
		ETA	**Informational Literacy Skills**
		E	**Media Literacy Skills**
		E	**Information, Communication, and Technology (ICT) Literacy**

Career Ready Practices:

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.*

E	**CRP1. Act as a responsible and contributing citizen and employee**
E	**CRP2. Apply appropriate academic and technical skills**
	CRP3. Attend to personal health and financial well-being
ETA	**CRP4. Communicate clearly and effectively with reason**
	CRP5. Consider the environmental, social and economic impacts of decisions
E	**CRP6. Demonstrate creativity and innovation**
E	**CRP7. Employ valid and reliable research strategies**
ETA	**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them**
	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals
	CRP11. Use technology to enhance productivity
	CRP12. Work productively in teams while using cultural global competence

Student Learning Goals/Objectives:

Students will know….

- The number system is based on a well-defined system.
- Every numerical operation has an inverse.
- Computational fluency requires efficient, accurate and flexible methods for computing.
- Rational numbers can be represented in multiple ways.
- In a multi-digit number, a number in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
- Multiplying by a power of 10 shifts the digits of a whole number or decimal that many places to the left.
- The exponent not only indicates how many

Students will be able to (do)…

- Fluently multiply multi-digit numbers using the standard algorithm
- Use exponents to denote powers of 10
- Divide a multi-digit dividend by a two-digit divisor

places the decimal is moving, but also that you are multiplying or making the number 10 times greater, three times, when you multiply 10	

Key Vocabulary and Terms:

- Area model
- Base
- Dividend
- Divisor
- Quotient
- Efficient
- Expanded form
- Exponent
- Exponential notation
- Powers of 10
- Relation symbol
- Standard notation
- Remainder
- US Traditional multiplication

Assessment Evidence:

Performance Tasks:	**Other Assessment Measures**
• One Million Taps • Pendulums • https://www.illustrativemathematics.org/content-standards/tasks/1931	Summative • Quizzes • Unit Test • Diagnostic Assessments Formative • Slate Assessments • Entry/Exit Slips • Progress Monitoring • Classwork/ Homework

	• Guided Practice • Open Response Assessments
Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)	
Instructional Strategies and Activities (add rows as needed) **Title*	***Consider how will the design will: (WHERETO – Understanding By Design –Wiggins and McTighe)*** **W** = Help the students know Where the unit is going and What is expected? Help the teacher know Where the students are coming from (prior knowledge and interests)? **H**= Hook all students and Hold their interest? **E**= Equip students, help the Experience the key ideas and Explore the issue? **R**=Provide opportunities to Rethink and Revise their understandings and work? **E**=Allow students to Evaluate their work and its implications? **T**=be Tailored (personalized to the different needs, interests and abilities of learners? **O**=be Organized to maximize initial and sustained engagement as well as effective learning? **Description with Modifications, number of days, etc.**
24. Exponents and Powers of 10	Using base ten manipulatives, students will use exponents to denote powers of 10 (3 days) *D~ • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
25. Division	Using grip paper, students will divide numbers with a two-digit divisor *D~ Use arrays and counters • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections

	• Modeling • Graphic Organizers
26. Pendulums	Using stopwatch, ruler, and string, students will investigate the effect of pendulum length on pendulum swing time. *D~ review plotting points and examine pendulums • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
27. Resources:	• District Approved Textbook • https://www.illustrativemathematics.org/content-standards/tasks/1931
• Suggested Time Frame: 15-20 days	

**D* – Indicates differentiation at the Lesson Level (Identify Modifications for ELL, Gifted and Talented, Basic Skills, Special Education)

Content Area:	Math	Grade(s): 5th
Unit Plan Title:	Unit Two: Multi-Digit Whole Numbers and Numerical Operations	

Overview/Rationale

In this unit, students expand their previous understanding of place value to include decimal numbers. Understanding of the place value system will allow students to grasp and deepen the concepts of multiplication and division. Grade 5 is the last grade that the NBT domain appears in the Student Learning Standards.

Standard(s) Number and Description

MA.5.5.OA.A.1 - [*Standard*] - Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
MA.5.5.OA.A.2 - [*Standard*] - Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.
MA.5.5.NBT.A.1 - [*Standard*] - Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
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MA.5.5.NBT.B.5 - [*Standard*] - Fluently multiply multi-digit whole numbers using the standard algorithm.
MA.5.5.NBT.B.6 - [*Standard*] - Find whole-number quotients of whole numbers with up to four-digit dividends and two-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.
MA.5.5.NBT.B.7 - [*Standard*] - Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
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MP1- Make sense of problems and persevere in solving them
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• How can you use the inverse of a numerical operation to help you compute an answer?
• Which mathematical skills are necessary to be fluent in computation?

- How can you represent rational numbers in multiple ways?
- What occurs when decimals are multiplied, divided, or ordered by 10 or powers of 10?
- What are the standard procedures for estimating and finding products involving decimals?
- What are the standard procedures for estimating and finding quotients involving decimals?

21st Century Connections

Check all that apply. 21st Century Interdisciplinary Themes		*Indicate whether these skills are **E**-Encouraged, **T**-Taught, and/or **A**-Assessed in this unit by marking **E, T, A** in the box before the appropriate skill.* 21st Century Skills	
X	Global Awareness	ETA	Critical Thinking and Problem Solving
	Environmental Literacy	ETA	Creativity and Innovation
	Health Literacy	ETA	Communication and Collaboration
	Civic Literacy	E	Flexibility and Adaptability
	Financial, Economic , Business and Entrepreneurial Literacy	ET	Initiative and Self-Direction
		E	Social and Cross-Cultural Skills
		ETA	Productivity and Accountability
		ET	Leadership and Responsibility
		ETA	Informational Literacy Skills
		E	Media Literacy Skills
		E	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.*

	E	CRP1. Act as a responsible and contributing citizen and employee
	E	CRP2. Apply appropriate academic and technical skills

	CRP3. Attend to personal health and financial well-being
ETA	**CRP4. Communicate clearly and effectively with reason**
	CRP5. Consider the environmental, social and economic impacts of decisions
E	**CRP6. Demonstrate creativity and innovation**
E	**CRP7. Employ valid and reliable research strategies**
ETA	**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them**
	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals
E	**CRP11. Use technology to enhance productivity**
E	**CRP12. Work productively in teams while using cultural global competence**

Student Learning Goals/Objectives:

Students will know….	***Students will be able to (do)…***
• The number system is based on a well-defined system. • Every numerical operation has an inverse. • Computational fluency requires efficient, accurate and flexible methods for computing. • Rational numbers can be represented in multiple ways. • In a multi-digit number, a number in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. • Multiplying by a power of 10 shifts the digits of a whole number or decimal that many places to the left. The exponent not only indicates how many places the decimal is moving, but also that you are multiplying or making the number 10 times greater, three times, when you multiply 10	• Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols • Write simple expressions that record calculations with numbers, and interpret them without evaluating them • Recognize that a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. • Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. • Fluently multiply multi-digit whole numbers using the standard algorithm

	• Find whole number quotients of whole numbers with up to four digit dividends and two digit divisors. • Add, subtract, multiply and divide decimals to hundredths.
Key Vocabulary and Terms:	
• Parentheses • Expression • Dividend • Divisor • Quotient • Powers of ten • Hundredth • Place value • Algorithm • Exponent • Order of operations • Evaluate	
Assessment Evidence:	
Performance Tasks: *(Through what authentic performance tasks will students demonstrate the desired understandings? By what criteria will performances of understanding be judged?)*	**Other Assessment Measures*:*** *(Through what other evidence (E.g. quizzes, tests, academic prompts, observations, homework, journals, etc.) will students demonstrate achievement of the desired results? How will students reflect upon and self- assess their learning?)* ***Include Benchmarks*** Summative • Quizzes • Unit Test • Diagnostic Assessments Formative • Slate Assessments

	• Entry/Exit Slips • Progress Monitoring • Classwork/ Homework • Guided Practice • Open Response Assessments
Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)	
Instructional Strategies and Activities (add rows as needed) **D* **Title**	***Consider how will the design will: (WHERETO – Understanding By Design –Wiggins and McTighe)*** **W** = Help the students know Where the unit is going and What is expected? Help the teacher know Where the students are coming from (prior knowledge and interests)? **H**= Hook all students and Hold their interest? **E**= Equip students, help the Experience the key ideas and Explore the issue? **R**=Provide opportunities to Rethink and Revise their understandings and work? **E**=Allow students to Evaluate their work and its implications? **T**=be Tailored (personalized to the different needs, interests and abilities of learners? **O**=be Organized to maximize initial and sustained engagement as well as effective learning? **Description with Modifications, number of days, etc.**
28. Order of Operations	Students will use parentheses, brackets, and braces in numerical expressions, and evaluate expressions with these symbols (3-5 days) *D~ review PEMDAS • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers

29. Patterns with Zeros with Powers of 10	Students will explain patterns in the number of zeros when multiplying or dividing by powers of 10 (5-7 days) *D~ review place value, use chart for locations • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
30. Multiply Whole Numbers	Students will multiply multi-digit numbers using the traditional method (7-8 days) *D~ review partial-products multiplication, use arrays and area models • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
31. Divide with Whole Numbers	Students will divide multi-digit numbers (5-7 days) *D~ review using counters and arrays, and division steps • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers

32. Decimals to the Hundredths	Students will add, subtract, multiply, and divide decimals to the hundredths (10-12 days) *D~ review multiplication and estimation • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
Resources:	
• District Approved Textbook • https://www.illustrativemathematics.org/ • www.greatminds.org	
Suggested Time Frame:	30-35 days

**D* – Indicates differentiation at the Lesson Level (Identify Modifications for ELL, Gifted and Talented, Basic Skills, Special Education)

Content Area:	Math	Grade(s): 5th Grade
Unit Plan Title:	Unit Three: Addition and Subtraction of Fractions	

Overview/Rationale

In this unit, students will use what they've learned in Grades 3 and 4 about equivalency in terms of visual models and benchmarks to extend understanding of adding and subtracting fractions, including mixed numbers. They reason about size of fractions to make sense of their answers- e.g. they understand that the sum of ½ and 2/3 will be greater than 1.
It is important to note that in some cases it may not be necessary to find least common denominator to add fractions with unlike denominators. Students should be encouraged to use their conceptual understanding of fractions rather than just using the algorithm for adding fractions.

Standard(s) Number and Description

MA.5.5.NF.A.1 - [*Standard*] - Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.
MA.5.5.NF.A.2 - [*Standard*] - Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

Math Practice Standards Number and Description

MP5- Use appropriate tools strategically
MP8- Look for and express regularity in repeated reasoning

Technology Standard(s) Number and Description

TECH.8.1.5 - [Standard] - All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.5.B - [Strand] - Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.5.C - [Strand] - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.5.E - [Strand] - Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.5.F - [Strand] - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
TECH.8.2.5.E - [Strand] - Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

Interdisciplinary Standard(s) Number and Description

LA.5.W.5.2.E - Provide a conclusion related to the information of explanation presented.
LA.5.SL.5.4 - [*Progress Indicator*] - Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

LA.5.SL.5.5 - [*Progress Indicator*] - Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
3-5-ETS1-1 - [*Performance Expectation*] - Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
3-5-ETS1-2 - [*Performance Expectation*] - Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
3-5-ETS1-3 - [*Performance Expectation*] - Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Enduring Understandings:

Students will understand that…
• Fractions can be used to aid in explaining real world problems.
• Benchmark fractions and other strategies aid in estimating the reasonableness of results with operations of fractions.
• The use of area models, fraction strips, and number lines are effective strategies to model sums and differences.
• Equivalent fractions are critical when adding and subtracting fractions with unlike denominators.
• Fractions are division models.
• Use your knowledge of fractions and equivalence to develop algorithms for adding and subtracting.

Essential Questions :

• How is computation with rational numbers similar or different to whole number computation?
• What does it mean to add and subtract fractions with unlike denominators?
• How do you add and subtract fractional parts with like and unlike denominators?
• What does it mean to add and subtract mixed numbers?
• What is a standard procedure for adding and subtracting?

21st Century Connections:

Check all that apply. **21st Century Interdisciplinary Themes**		*Indicate whether these skills are **E**-Encouraged, **T**-Taught, and/or **A**-Assessed in this unit by marking **E, T, A** in the box before the appropriate skill.* **21st Century Skills**	
X	**Global Awareness**	**ETA**	**Critical Thinking and Problem Solving**
	Environmental Literacy	**ETA**	**Creativity and Innovation**

	Health Literacy
	Civic Literacy
	Financial, Economic , Business and Entrepreneurial Literacy

ETA	Communication and Collaboration
ET	Flexibility and Adaptability
ET	Initiative and Self-Direction
E	Social and Cross-Cultural Skills
ETA	Productivity and Accountability
ET	Leadership and Responsibility
ETA	Informational Literacy Skills
E	Media Literacy Skills
E	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.*

E	CRP1. Act as a responsible and contributing citizen and employee
ET	CRP2. Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being
ETA	CRP4. Communicate clearly and effectively with reason
	CRP5. Consider the environmental, social and economic impacts of decisions
ET	CRP6. Demonstrate creativity and innovation
E	CRP7. Employ valid and reliable research strategies
ETA	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals

	E	**CRP11. Use technology to enhance productivity** **CRP12. Work productively in teams while using cultural global competence**

Student Learning Goals/Objectives:

Students will know….	***Students will be able to (do)…***
• Fractions can be used to aid in explaining real world problems. • Benchmark fractions and other strategies aid in estimating the reasonableness of results with operations of fractions. • The use of area models, fraction strips, and number lines are effective strategies to model sums and differences. • Equivalent fractions are critical when adding and subtracting fractions with unlike denominators. • Fractions are division models. • Use your knowledge of fractions and equivalence to develop algorithms for adding and subtracting.	• Add and subtract fractions with unlike denominators (including muxed numbers). • Solve word problems involving and subtraction of fractions. • Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of numbers.

Key Vocabulary and Terms:

- Numerator
- Denominator
- Benchmark fractions
- Vinculum
- Conjecture
- Mixed number
- Argument
- Dividend
- Equivalent fractions
- Quick common denominator

Assessment Evidence:

Performance Tasks: *(Through what authentic performance tasks will students demonstrate the desired understandings? By what criteria will performances of understanding be judged?)*	**Other Assessment Measures*:*** ****Include Benchmarks*** Summative • Quizzes • Unit Test • Diagnostic Assessments Formative • Slate Assessments • Entry/Exit Slips • Progress Monitoring • Classwork/ Homework • Guided Practice • Open Response Assessments
Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)	
Instructional Strategies and Activities (add rows as needed) **D* **Title**	***Consider how will the design will: (WHERETO – Understanding By Design –Wiggins and McTighe)*** **W** = Help the students know Where the unit is going and What is expected? Help the teacher know Where the students are coming from (prior knowledge and interests)? **H**= Hook all students and Hold their interest? **E**= Equip students, help the Experience the key ideas and Explore the issue? **R**=Provide opportunities to Rethink and Revise their understandings and work? **E**=Allow students to Evaluate their work and its implications? **T**=be Tailored (personalized to the different needs, interests and abilities of learners? **O**=be Organized to maximize initial and sustained engagement as well as effective learning? **Description with Modifications, number of days, etc.**
33. Add and Subtract Fractions	Students will add and subtract fractions with unlike denominators (6-8 days) *D~ review equivalent fractions • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction

	• Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
34. Solve Subtraction of Fraction Word Problems	Students will solve word problems involving fractions (4-6 days) *D~ review equivalent fractions • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
35. Benchmark Fractions	Students will use benchmark fractions and number sense to fractions to estimate (6-8 days) *D~ review unit fractions and fractions on a number line • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
Resources:	
• District Approved Textbook • https://www.illustrativemathematics.org/ • www.greatminds.org	
Suggested Time Frame:	20-25 days

Content Area:	Math	Grade(s): 5th Grade
Unit Plan Title:	Unit Four: Multiplication and Division of Fractions and Decimals	

Overview/Rationale

In previous grades, students have developed an understanding of fractions as numbers. IN 5th grade, students will develop an understanding of the connection between fractions and division. They will use this understanding to explore the relationship of multiplication and division when multiplying fractions.

Standard(s) Number and Description

MA.5.5.OA.A.1 - [*Standard*] - Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
MA.5.5.OA.A.2 - [*Standard*] - Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.
MA.5.5.NBT.B.7 - [*Standard*] - Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
MA.5.5.NF.B.3 - [*Standard*] - Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
MA.5.5.NF.B.4a - Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b.
MA.5.5.NF.B.5a - Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
MA.5.5.NF.B.5b - Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (n×a)/(n×b) to the effect of multiplying a/b by 1.
MA.5.5.NF.B.6 - [*Standard*] - Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
MA.5.5.NF.B.7a - Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.
MA.5.5.NF.B.7b - Interpret division of a whole number by a unit fraction, and compute such quotients.
MA.5.5.NF.B.7c - Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.
MA.5.5.MD.A.1 - [*Standard*] - Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.
MA.5.5.MD.B.2 - [*Standard*] - Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for

this grade to solve problems involving information presented in line plots.

Math Practice Standards Number and Description

MP3- Construct viable arguments and critique the reasoning of others
MP4- Model with mathematics

Technology Standard(s) Number and Description

TECH.8.1.5 - [Standard] - All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.5.B - [Strand] - Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.5.C - [Strand] - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.5.E - [Strand] - Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.5.F - [Strand] - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
TECH.8.2.5.E - [Strand] - Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

Interdisciplinary Standard(s) Number and Description

LA.5.W.5.2.E - Provide a conclusion related to the information of explanation presented.
LA.5.SL.5.4 - [*Progress Indicator*] - Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
LA.5.SL.5.5 - [*Progress Indicator*] - Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
3-5-ETS1-1 - [*Performance Expectation*] - Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
3-5-ETS1-2 - [*Performance Expectation*] - Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
3-5-ETS1-3 - [*Performance Expectation*] - Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Enduring Understandings:

Students will understand that…

- Benchmark fractions and other strategies aid in estimating the reasonableness of results with operations of fractions.
- The use of area models, fraction strips, and number lines are effective strategies to model products and quotients.
- Fractions are division models.
- Multiplication can be interpreted as scaling/resizing.
- Use your knowledge of fractions and equivalence to develop algorithms for multiplying and dividing.

Essential Questions :

- How is computation with fractional numbers similar or different to whole number computation?
- How do you use previous understandings of multiplication and division to multiply or divide fractions?
- How does multiplication and division of fractions help to solve real world problems?
- What does it mean to multiply a number by a fraction?
- What are the standard procedures for estimating and finding products and quotients of fractions and mixed numbers?

21st Century Connections :

Check all that apply. **21st Century Interdisciplinary Themes**		*Indicate whether these skills are **E**-Encouraged, **T**-Taught, and/or **A**-Assessed in this unit by marking **E, T, A** in the box before the appropriate skill.* **21st Century Skills**	
X	**Global Awareness**	**ETA**	**Critical Thinking and Problem Solving**
	Environmental Literacy	**ETA**	**Creativity and Innovation**
	Health Literacy	**ETA**	**Communication and Collaboration**
	Civic Literacy	**E**	**Flexibility and Adaptability**
	Financial, Economic , Business and Entrepreneurial Literacy	**ET**	**Initiative and Self-Direction**
		E	**Social and Cross-Cultural Skills**
		ETA	**Productivity and Accountability**
		E	**Leadership and Responsibility**

ET	**Informational Literacy Skills**
E	**Media Literacy Skills**
E	**Information, Communication, and Technology (ICT) Literacy**

Career Ready Practices:

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.*

E	**CRP1. Act as a responsible and contributing citizen and employee**
E	**CRP2. Apply appropriate academic and technical skills**
	CRP3. Attend to personal health and financial well-being
ETA	**CRP4. Communicate clearly and effectively with reason**
	CRP5. Consider the environmental, social and economic impacts of decisions
E	**CRP6. Demonstrate creativity and innovation**
E	**CRP7. Employ valid and reliable research strategies**
ETA	**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them**
	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals
	CRP11. Use technology to enhance productivity
	CRP12. Work productively in teams while using cultural global competence

Student Learning Goals/Objectives:

Students will know….	***Students will be able to (do)…***
• Benchmark fractions and other strategies aid in estimating the reasonableness of results with operations of fractions. • The use of area models, fraction strips, and number lines are	• Add, subtract, multiply, and divide decimals to the hundredths. • Interpret fractions as division of the numerator by the denominator. • Multiply a fraction or whole number by a fraction.

effective strategies to model products and quotients. • Fractions are division models. • Multiplication can be interpreted as scaling/resizing. • Use your knowledge of fractions and equivalence to develop algorithms for multiplying and dividing.	• Explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number • Explain why multiplying a given number by a fraction less than 1 results in a product less than the given number. • Apply and extend previous understanding of division to divide unit fractions by whole numbers and whole numbers by unit fractions.
Key Vocabulary and Terms:	
• Algorithm • Factor • Equivalent fraction • Unit fractions • Product • Quotient	
Assessment Evidence:	
Performance Tasks: *(Through what authentic performance tasks will students demonstrate the desired understandings? By what criteria will performances of understanding be judged?)*	**Other Assessment Measures*:*** ****Include Benchmarks*** Summative • Quizzes • Unit Test • Diagnostic Assessments Formative • Slate Assessments • Entry/Exit Slips • Progress Monitoring • Classwork/ Homework • Guided Practice • Open Response Assessments
Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)	

Instructional Strategies and Activities (add rows as needed) **Title**	***Consider how will the design will: (WHERETO – Understanding By Design –Wiggins and McTighe)*** **W** = Help the students know Where the unit is going and What is expected? Help the teacher know Where the students are coming from (prior knowledge and interests)? **H**= Hook all students and Hold their interest? **E**= Equip students, help the Experience the key ideas and Explore the issue? **R**=Provide opportunities to Rethink and Revise their understandings and work? **E**=Allow students to Evaluate their work and its implications? **T**=be Tailored (personalized to the different needs, interests and abilities of learners? **O**=be Organized to maximize initial and sustained engagement as well as effective learning? **Description with Modifications, number of days, etc.**
36. Decimals to the Hundredths	Students will multiply and divide with decimals to the hundredths (5-7 days) *D~ review multiplication and division strategies, use arrays and area models • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
37. Multiply with Fractions	Students will multiply a fraction or whole number by a fraction (8-10 days) *D~ review converting between improper fractions and mixed numbers • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
38. Compare Factors to Products	Students will explain the relationship between the factors and the products (8-10 days) *D~ review area models for multiplication

	• Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
39. Divide with Fractions	Students will divide unit fractions by whole numbers and whole numbers by unit fractions (6-8 days) *D~ review division using illustrations • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
Resources:	
• District Approved Textbook • https://www.illustrativemathematics.org/ • www.greatminds.org	
Suggested Time Frame	30-35 days

**D* – Indicates differentiation at the Lesson Level (Identify Modifications for ELL, Gifted and Talented, Basic Skills, Special Education)

Content Area:	Math	Grade(s): 5th
Unit Plan Title:	Unit Five: Addition and Multiplication with Area and Volume	

Overview/Rationale

In this unit, students expand their understanding of area by utilizing and counting whole and fractional unit squares. students expand their understanding of geometric measurement and spatial structuring to include volume as an attribute of three-dimensional space. In this unit, students develop this understanding using concrete models to discover strategies for finding area and volume, whereas in later units, students generalize this understanding in real-world problems and apply strategies and formulas. Area is addressed in two units (unit 1 and unit 7). Volume is addressed in two units (unit 1 and unit 6) because it is a major emphasis in Grade 5. The connection to multiplication and addition provides an opportunity for students to start the year off by applying the multiplication and addition strategies they learned in previous grades in a new, interesting context.

Standard(s) Number and Description

5.NF.B.4 - [*Standard*] - Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
5.NF.B.4b - Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
5.MD.C.3a - A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.
5.MD.C.3b - A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.
5.MD.C.4 - [*Standard*] - Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.
5.MD.C.5a - Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
5.MD.C.5b - Apply the formulas V = l × w × h and V = B × h for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems.
5.MD.C.5c - Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.
5.G.B.3 - [*Standard*] - Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.
MA.5.5.G.B.4 - [*Standard*] - Classify two-dimensional figures in a hierarchy based on properties.

Math Practice Standards Number and Description

MP3- Construct viable arguments and critique the reasoning of others
MP4- Model with mathematics

Technology Standard(s) Number and Description

TECH.8.2.5.C.7 - [*Cumulative Progress Indicator*] - Work with peers to redesign an existing product for a different purpose.
TECH.8.2.5.E.CS1 - [*Content Statement*] - Computational thinking and computer programming as tools used in design and engineering.

TECH.8.2.5.D.CS1 - [*Content Statement*] - Apply the design process.

Interdisciplinary Standard(s) Number and Description

LA.5.SL.5.4 - [*Progress Indicator*] - Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
LA.5.SL.5.5 - [*Progress Indicator*] - Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.

Enduring Understandings:

Students will understand that…

- Area is an attribute of two-dimensional space and is measured in square units.
- Multiple rectangles can have the same area.
- Area can be found by adding the square units or by multiplying the two dimensions.
- Volume is an attribute of three-dimensional space and is measured in cubic units.
- Multiple rectangular prisms can have the same volume.
- Volume can be found by repeatedly adding the area of the base or by multiplying all three dimensions.
- Two-dimensional shapes can be described and classified by their properties.
- Two-dimensional shapes are composed of various parts that are described with precise vocabulary.

Essential Questions :

- What is area and how is it used in real life?
- How do you determine the area of a rectangle?
- What does the area of a rectangle mean and how can it be found?
- What is volume and how is it used in real life?
- How do you determine the volume of a cube or rectangular prism?
- How can three-dimensional shapes be represented and analyzed?
- What does the volume of a rectangular prism mean and how can it be found?
- How does it relate to the area of a rectangle?
- How can we describe, classify, and name different shapes (polygons, triangles, and quadrilaterals)?
- Why is it important to use precise language and mathematical tools in the study of two-dimensional shapes?
- How can describing, classifying, and comparing properties of two-dimensional shapes be using in solving problems in our three-dimensional world?

21st Century Connections:

Check all that apply.

21st Century Interdisciplinary Themes

X	**Global Awareness**
X	**Environmental Literacy**
	Health Literacy
	Civic Literacy
	Financial, Economic , Business and Entrepreneurial Literacy

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, and/or **A**-Assessed in this unit by marking **E, T, A** in the box before the appropriate skill.*

21st Century Skills

ETA	**Critical Thinking and Problem Solving**
ETA	**Creativity and Innovation**
ET	**Communication and Collaboration**
E	**Flexibility and Adaptability**
E	**Initiative and Self-Direction**
E	**Social and Cross-Cultural Skills**
ETA	**Productivity and Accountability**
E	**Leadership and Responsibility**
ETA	**Informational Literacy Skills**
E	**Media Literacy Skills**
E	**Information, Communication, and Technology (ICT) Literacy**

Career Ready Practices:

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.*

E	**CRP1. Act as a responsible and contributing citizen and employee**
ETA	**CRP2. Apply appropriate academic and technical skills**
	CRP3. Attend to personal health and financial well-being
ETA	**CRP4. Communicate clearly and effectively with reason**
	CRP5. Consider the environmental, social and economic impacts of decisions

E	**CRP6. Demonstrate creativity and innovation**
E	**CRP7. Employ valid and reliable research strategies**
ET	**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them**
	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals
E	**CRP11. Use technology to enhance productivity**
E	**CRP12. Work productively in teams while using cultural global competence**

Student Learning Goals/Objectives:

Students will know….	***Students will be able to (do)…***
• Area is an attribute of two-dimensional space and is measured in square units • Multiple rectangles can have the same area • Area can be found by repeatedly adding the square units or multiplying the two-dimensions • Volume is an attribute of three-dimensional space and is measured in cubic units • Multiple rectangular prisms can have the same volume • Volume can be found by repeatedly adding the area of the base or by multiplying all three dimensions	• Explore strategies for finding area of rectangles with fractional side lengths • Informally compare volumes of three-dimensional units • Measure volume of rectangular prisms using non-standard units • Count the number of cubes it takes to fill a rectangular prism • Relate volume to multiplication and addition by iterating layers • Calculate the volume using two different formulas (V= l x w x h; V= B x h)

Key Vocabulary and Terms:

- 3-dimensional
- Unit squares
- Area
- Volume
- Unit cube
- Conjecture

- Argument

Assessment Evidence:

Performance Tasks	**Other Assessment Measures**
• Construct quilt model (area) • Construct rectangular prisms (volume) • Planning an athletic field • Planning an aquarium • Treasure hunt https://www.illustrativemathematics.org/content-standards/tasks/2190 http://www.insidemathematics.org/assets/common-core-math-tasks/how%20many%20cubes.pdf	Summative • Quizzes • Unit Test • Diagnostic Assessments Formative • Slate Assessments • Entry/Exit Slips • Progress Monitoring • Classwork/ Homework • Guided Practice • Open Response Assessments

Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)

Instructional Strategies and Activities (add rows as needed) *D **Title**	***Consider how will the design will: (WHERETO – Understanding By Design –Wiggins and McTighe)*** **W** = Help the students know Where the unit is going and What is expected? Help the teacher know Where the students are coming from (prior knowledge and interests)? **H**= Hook all students and Hold their interest? **E**= Equip students, help the Experience the key ideas and Explore the issue? **R**=Provide opportunities to Rethink and Revise their understandings and work? **E**=Allow students to Evaluate their work and its implications? **T**=be Tailored (personalized to the different needs, interests and abilities of learners? **O**=be Organized to maximize initial and sustained engagement as well as effective learning? **Description with Modifications, number of days, etc.**
40. Finding the Area of Rectangles	Using grid paper, students will find the area of rectangles (4-5 days) *D Model and show tiles/sticky notes to show the layout of area • Breaking down the task • Providing step-by-step prompts

	• Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
41. Finding the Volume of Rectangular Prisms	Use grid paper, centimeter cubes, and rectangular prism boxes, students will find the volume of rectangular prisms (8-10 days) *D~ Find different/concrete examples of rectangular prisms • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
42. Planning an Athletic Field	Using slates, calculators, dice, and counters, students will plan out an athletic field based on a given area. *D~ review unit conversions, observe examples of athletic fields • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
43. Planning an Aquarium	Using slates, calculators, rules, tape measures, milk containers, students will plan out an aquarium *D~ review length, area, and volume, show examples and experience • Breaking down the task • Providing step-by-step prompts

	• Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
Resources:	
http://www.insidemathematics.org/assets/common-core-math-tasks/how%20many%20cubes.pdf https://www.illustrativemathematics.org/content-standards/tasks/2190 https://www.engageny.org/resource/grade-5-mathematics District Approved Textbook	
Suggested Time Frame:	Approximately 20-25 days

**D* – Indicates differentiation at the Lesson Level (Identify Modifications for ELL, Gifted and Talented, Basic Skills, Special Education)

Content Area:	Math	Grade(s): 5th Grade
Unit Plan Title:	Unit Six: Problem Solving with the Coordinate Plane	

Overview/Rationale

In this unit, students are introduced to the coordinate plane, applying their knowledge of the number line to understand the relationship of the two dimensions of a point in the coordinate plane. Students connect their work with numerical patterns to form ordered pairs and graph these ordered pairs in the first quadrant of a coordinate plane. Students use this model to make sense of and explain the relationships within the numerical patterns they generate.

Standard(s) Number and Description

MA.5.5.OA.A.2 - [*Standard*] - Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.
MA.5.5.OA.B.3 - [*Standard*] - Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.
MA.5.5.G.A.1 - [*Standard*] - Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).
MA.5.5.G.A.2 - [*Standard*] - Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

Math Practice Standards Number and Description

MP2- Reason abstractly and quantitatively
MP7- Look for and make use of structure

Technology Standard(s) Number and Description

TECH.8.1.5 - [Standard] - All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.5.B - [Strand] - Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.5.C - [Strand] - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.5.E - [Strand] - Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.5.F - [Strand] - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
TECH.8.2.5.E - [Strand] - Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating

knowledge.

Interdisciplinary Standard(s) Number and Description

LA.5.W.5.2.E - Provide a conclusion related to the information of explanation presented.
LA.5.SL.5.4 - [*Progress Indicator*] - Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
LA.5.SL.5.5 - [*Progress Indicator*] - Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
3-5-ETS1-1 - [*Performance Expectation*] - Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
3-5-ETS1-2 - [*Performance Expectation*] - Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
3-5-ETS1-3 - [*Performance Expectation*] - Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Enduring Understandings:

Students will understand that…
• The coordinate plane can be used to model and compare numerical patterns.
• On the coordinate plane, a point represents the two facets of information associated with an ordered pair.
• Graphical representations can be used to make predications and interpretations about real world situations.
• In a coordinate plane, the first number indicates how far to travel from the origin in the direction of the x-axis and the second number indicates how far to travel in the direction of the y-axis.
• The coordinate plane can be used to model and compare numerical patterns.

Essential Questions :

• What is the purpose of a coordinate plane?
• How do you plot a point on a coordinate plane?
• How can graphing points on a coordinate plane help you predict and interpret a given situation?
• How can we show the relationship between sequences on a graph?
• How can graphing points on the coordinate plane help to solve real world and mathematical problems?

21st Century Connections:

Check all that apply.	*Indicate whether these skills are **E**-Encouraged, **T**-Taught, and/or **A**-Assessed in this unit by*

21st Century Interdisciplinary Themes		21st Century Skills	
		*marking **E, T, A** in the box before the appropriate skill.*	
X	Global Awareness	ETA	Critical Thinking and Problem Solving
	Environmental Literacy	ETA	Creativity and Innovation
	Health Literacy	ETA	Communication and Collaboration
	Civic Literacy	E	Flexibility and Adaptability
	Financial, Economic , Business and Entrepreneurial Literacy	ET	Initiative and Self-Direction
		E	Social and Cross-Cultural Skills
		ETA	Productivity and Accountability
		ET	Leadership and Responsibility
		ETA	Informational Literacy Skills
		E	Media Literacy Skills
		E	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.*

E	CRP1. Act as a responsible and contributing citizen and employee
E	CRP2. Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being
ETA	CRP4. Communicate clearly and effectively with reason
	CRP5. Consider the environmental, social and economic impacts of decisions
E	CRP6. Demonstrate creativity and innovation
E	CRP7. Employ valid and reliable research strategies

	ETA	**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them**
		CRP9. Model integrity, ethical leadership, and effective management
		CRP10. Plan education and career paths aligned to personal goals
	E	**CRP11. Use technology to enhance productivity**
	ET	**CRP12. Work productively in teams while using cultural global competence**

Student Learning Goals/Objectives:

Students will know….	***Students will be able to (do)…***
• The coordinate plane can be used to model and compare numerical patterns. • On the coordinate plane, a point represents the two facets of information associated with an ordered pair. • Graphical representations can be used to make predications and interpretations about real world situations. • In a coordinate plane, the first number indicates how far to travel from the origin in the direction of the x-axis and the second number indicates how far to travel in the direction of the y-axis. • The coordinate plane can be used to model and compare numerical patterns.	• Generate two numerical patterns using two given rules • Identify apparent relationships between corresponding terms • Form ordered pairs consisting of corresponding terms from two patterns, and graph the ordered pairs. • Graph points in the first quadrant of the coordinate plane

Key Vocabulary and Terms:

- Coordinate grid/plane
- Axis (x- and y- axis)
- Ordered pair
- Plot
- Origin

- Perpendicular
- Interpret
- Coordinate pair
- Intersect
- Extrapolate
- Interpolate
- Quadrant

Assessment Evidence:

Performance Tasks: *(Through what authentic performance tasks will students demonstrate the desired understandings? By what criteria will performances of understanding be judged?)*	**Other Assessment Measures*:*** ****Include Benchmarks*** Summative • Quizzes • Unit Test • Diagnostic Assessments Formative • Slate Assessments • Entry/Exit Slips • Progress Monitoring • Classwork/ Homework • Guided Practice • Open Response Assessments

Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)

Instructional Strategies and Activities (add rows as needed) **Title**	***Consider how will the design will: (WHERETO – Understanding By Design –Wiggins and McTighe)*** **W** = Help the students know Where the unit is going and What is expected? Help the teacher know Where the students are coming from (prior knowledge and interests)? **H**= Hook all students and Hold their interest? **E**= Equip students, help the Experience the key ideas and Explore the issue? **R**=Provide opportunities to Rethink and Revise their understandings and work? **E**=Allow students to Evaluate their work and its implications? **T**=be Tailored (personalized to the different needs, interests and abilities of learners? **O**=be Organized to maximize initial and sustained engagement as well as effective learning? **Description with Modifications, number of days, etc.**
44. Numerical Patterns with Rules	Students will generate patterns using given rules, and identify the relationships between corresponding terms (10-12 days) *D~ review in and out tables • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers
45. Graphing Points on a Coordinate Plane	Students will graph points on coordinate plane and interpret information from graph (10-12 days) *D~ review reading graphs and x and y axes. • Breaking down the task • Providing step-by-step prompts • Repeated practice • Individual/Small Group/Whole Class Instruction • Peer Tutoring • Meaningful Real Life Connections • Modeling • Graphic Organizers

46.	
Resources:	
• District Approved Textbook • https://www.illustrativemathematics.org/ • www.greatminds.org	
Suggested Time Frame:	25-30 days

**D* – Indicates differentiation at the Lesson Level (Identify Modifications for ELL, Gifted and Talented, Basic Skills, Special Education)

Curriculum Map- 5th Grade Mathematics

Grade 5		Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
5. OA - Operations & Algebraic Thinking							
H. Write and interpret numerical expressions.							
5.0A.1	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.		✔		✔		
5.0A.2	Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation "add 8 and 7, then multiply by 2" as 2 x (8 + 7). Recognize that 3 x (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product		✔		✔		✔
I. Analyze patterns and relationships.							
5.0A.3	Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.						✔
5. NBT – Number & Operations in Base Ten							
A. Understand the place value system.							
5.NBT.1	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	✔	✔				
5.NBT.2	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to	✔	✔				

	denote powers of 10.						
5.NBT.3 (a-b)	Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 x 100+4 x 10+7 x 1+3 x(1/10)+9 x (1/100) + 2 x (1/1000). b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	✔					
5.NBT.4	Use place value understanding to round decimals to any place.	✔					
B. Perform operations with multi-digit whole numbers and with decimals to hundredths.							
5.NBT.5	Fluently multiply multi-digit whole numbers using the standard algorithm.		✔				
5.NBT.6	Find whole-number quotients of whole numbers with up to four-digit dividends and two-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.		✔				
5.NBT.7	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	✔	✔		✔		
5. NF - Number & Operations — Fractions							
A. Use equivalent fractions as a strategy to add and subtract fractions.							
5.NF.1	Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*			✔			

5.NF.2	Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.			✔			
B. Apply and extend previous understandings of multiplication and division to multiply and divide fractions.							
5.NF.3	Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?				✔		
5.NF.4 (a-b)	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product (a/b) x q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a x q ÷ b. For example, use a visual fraction model to show (2/3) x 4 = 8/3, and create a story context for this equation. Do the same with (2/3) x (4/5) = 8/15. (In general, (a/b) x (c/d) = ac/bd.) b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as				✔	✔	

	rectangular areas.						
5.NF.5 (a-b)	Interpret multiplication as scaling (resizing), by: a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (n x a)/(n x b) to the effect of multiplying a/b by 1.				✔		
5.NF.6	Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.				✔		
5.NF.7 (a-c)	Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) x 4 = 1/3. b. Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 x (1/5) = 4. c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and				✔		

	equations to represent the problem. For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?						
5. MD – Measurement and Data							
A. Convert like measurement units within a given measurement system.							
5.MD.1	Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	✔	✔		✔		
B. Represent and interpret data.							
5.MD.2	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.				✔		
C. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.							
5.MD.3	Recognize volume as an attribute of solid figures and understand concepts of volume measurement. a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.					✔	
5.MD.4	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.					✔	
5.MD.5	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. a. Find the volume of a right rectangular prism with whole-					✔	

	number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. b. Apply the formulas V=l x w x h and V = b x h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems. c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.						
5. G - Geometry							
A. Graph points on the coordinate plane to solve real-world and mathematical problems.							
5.G.1	Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).						✔
5.G.2	Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.						✔
B. Classify two-dimensional figures into categories based on their properties.							
5.G.3	Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and					✔	

	squares are rectangles, so all squares have four right angles.						
5.G.4	Classify two-dimensional properties.					✔	