NEPTUNE CITY SCHOOL DISTRICT

Everyday Mathematics
Curriculum
Grade 4

NEPTUNE CITY SCHOOL DISTRICT
Office of the Chief School Administrator, Principal
210 West Sylvania Avenue
Neptune City, NJ 07753

The Neptune City School District is appreciative and proud to accept and align the curriculum of the Neptune Township School District to properly prepare the Neptune City students for successful integration into the Neptune Township High School Educational Program.

August 1, 2022 Document *

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SCHOOL DISTRICT MISSION STATEMENT

The Neptune City School District, in partnership with the parents and the community, will support and sustain an excellent system of learning, promote pride in diversity, and expect all students to achieve the New Jersey Student Learning Standards at all grade levels to become responsible and productive citizens.

NEPTUNE CITY SCHOOL DISTRICT

EVERYDAY MATHEMATICS
CURRICULUM
GRADE 4

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Curriculum

NEPTUNE TOWNSHIP SCHOOL DISTRICT

Everyday Mathematics
Grade 4

Acknowledgements

The Grade 4 Mathematics curriculum was revised for use by the Neptune Township Elementary Schools by the Curriculum Steering Committee, inclusive of Dawn Reinhardt, Department Chairperson, Heba Abdo, Ed.D., Supervisor of STEM, PE, and Health, and Sally A. Millaway, Ed.D., Director for Curriculum, Instruction and Assessment.

This curriculum represents the shift in instruction to the New Jersey Student Learning Standards for Mathematics and the increased rigor that those standards bring to the teaching and learning of mathematics. It is our hope that this curriculum will serve as a valuable resource for the staff members who teach this course and that they will continue to make recommendations for improvement to the document.

NEPTUNE TOWNSHIP SCHOOL DISTRICT

DISTRICT MISSION STATEMENT

The primary mission of the Neptune Township School District is to prepare students for a life-long learning process in a complex and diverse world. It is with high expectations that our schools foster:

• A strong foundation in academic and modern technologies.

• A positive and varied approach to teaching and learning.

• An emphasis on critical thinking skills and problem-solving techniques.

• A respect for and an appreciation of our world, its resources, and its people.

• A sense of responsibility, good citizenship, and accountability.

• An involvement by the parents and the community in the learning process.

Neptune Township School District

Educational Outcome Goals

The students in the Neptune Township schools will become life-long learners and will:

- Become fluent readers, writers, speakers, listeners, and viewers with comprehension and critical thinking skills.
- Acquire the mathematical skills, understandings, and attitudes that are needed to be successful in their careers and everyday life.
- Understand fundamental scientific principles, develop critical thinking skills, and demonstrate safe practices, skepticism, and open-mindedness when collecting, analyzing, and interpreting information.
- Become technologically literate.
- Demonstrate proficiency in all New Jersey Student Learning Standards (NJSLS).
- Develop the ability to understand their world and to have an appreciation for the heritage of America with a high degree of literacy in civics, history, economics and geography.
- Develop a respect for different cultures and demonstrate trustworthiness, responsibility, fairness, caring, and citizenship.
- Become culturally literate by being aware of the historical, societal, and multicultural aspects and implications of the arts.
- Demonstrate skills in decision-making, goal setting, and effective communication, with a focus on character development.
- Understand and practice the skills of family living, health, wellness and safety for their physical, mental, emotional, and social development.
- Develop consumer, family, and life skills necessary to be a functioning member of society.
- Develop the ability to be creative, inventive decision-makers with skills in communicating ideas, thoughts and feelings.
- Develop career awareness and essential technical and workplace readiness skills, which are significant to many aspects of life and work.

Everyday Math - Grade 4 - Daily Pacing Guide

Day	Unit & Lesson	Topic / Activity	NJSLS-M	Day	Unit & Lesson	Topic / Activity	NJSLS-M
1		Routines Overview		16		Flex Day - EDM Games and Centers	
2	1.1	Place Value in Whole Number	4.NBT.1, 4.NBT.2, 4.NBT.5	17	1.11	Points, Line Segments, Lines, and Rays	4.G.1
3	District Assess	Math Pre-Assessment		18	1.12	Sngles, Triangles, and Quadrilaterals	4.G.1, 4.G.2
4	1.2	Place Value Concepts	4.NBT.1, 4.NBT.2	19	1.13	Finding the Perimeters of Squares and Rectangles	4.NBT.4, 4.NBT.5, 4.MD.1, 4.MD.3, 4.G.2
5	1.3	Formal Procedures for Rounding	4.NBT.2, 4.NBT.3	20		Unit 1 Review	
6		Flex Day - EDM Games and Centers		21	1.14	Unit 1 Progress Check - Day 1	
7	1.4	Introduction to the Student Reference Book	4.NBT.1, 4.NBT.2, 4.NBT.3, 4.NBT.5	22		Flex Day - EDM Games and Centers	
8	1.5	Estimation Strategies	4.OA.3, 4.NBT.3, 4.NBT.4	23	1.14	Unit 1 Progress Check - Day 2	
9	1.6	Guide to Solving Number Stories	4.OA.3, 4.NBT.4	24	2.1	Square Number Patterns	4.OA.5, 4.NBT5
10	1.7	U.S. Traditional Addition	4.OA.3, 4.NBT.2, 4.NBT.4	25	2.2	The Area Formula for Rectangles	4.NBT.4, 4.NBT.5, 4.MD.3
11		Flex Day - EDM Games and Centers		26	2.3	Factors and Factor Pairs	4.OA.4, 4.NBT.5, 4.NBT.6
12	1.8	Open Response: Cracking the Muffin Code - Day 1	4.OA.5, 4.NBT.1	27		Flex Day - EDM Games and Centers	
13	1.8	Open Response: Cracking the Muffin Code - Day 2	4.OA.5, 4.NBT.1	28	2.4	Multiples	4.OA.4, 4.OA.5, 4.NBT.5, 4.NBT.6
14	1.9	U.S. Traditional Subtraction	4.OA.3, 4.NBT.2, 4.NBT.4	29	2.5	Prime and Composite Numbers	4.OA.4, 4.NBT.5, 4.NBT.6
15	1.10.	U.S. Customary Units of Length	4.NBT.3, 4.NBT.4, 4.NBT.5, 4MD.1, 4.MD.2	30	2.6	Open Response: Little and Big - Day 1	4.OA.1, 4.OA.2, 4.OA.5

Day	Unit & Lesson	Topic / Activity	NJSLS-M	Day	Unit & Lesson	Topic / Activity	NJSLS-M
31	2.6	Open Response: Little and Big - Day 2	4.OA.1, 4.OA.2, 4.OA.5	46	3.2	Fraction Circles and Equivalence	4.OA.4, 4.OA.5, 4.NF.1
32		Flex Day - EDM Games and Centers		47	3.3	Number Lines and Equivalence	4.NF.1, 4.NF.2
33	2.7	Units of Time	4.NBT.4, 4.NBT.5, 4.MD.1, 4.MD.2	48		Flex Day - EDM Games and Centers	
34	2.8	Multiplicative Comparisons	4.OA.1, 4.OA.2, 4.NBT.5	49	3.4	An Equivalent Fractions Rule	4.OA.4, 4.OA.5, 4.NF.1
35	2.9	Multiplicative Comparison Number Stories	4.OA.1, 4.OA.2, 4.NBT.4, 4.NBT.5	50	3.5	Open Response: Veggie Pizzas - Day 1	4.NF.2
36	2.10.	Classifying Triangles	4.G.2	51	3.5	Open Response: Veggie Pizzas - Day 2	4.NF.2
37		Flex Day - EDM Games and Centers		52	3.6	Comparing Fractions	4.NF.1, 4.NF.2
38	2.11	Classifying Quadrilaterals	4.G.1, 4.G.2	53		Flex Day - EDM Games and Centers	
39	2.12	Finding Line Symmetry	4.G.3	54	3.7	Comparing and Ordering Fractions	4.NF.2
40	2.13	Finding the Pattern	4.OA.5, 4.NBT.4, 4.NBT.5	55	3.8	Modeling Tenths with Fraction Circles	4.NF.1, 4.NF.3, 4.NF.3b, 4.NF.6, 4.NF.7, 4.MD.2
41		Unit 2 Review		56	3.9	Modeling Decimals with Base-10 Blocks	4.NF.6
42	2.14	Unit 2 Progress Check - Day 1		57	3.10.	Tenths and Hundredths	4.NF.5, 4.NF.6, 4.NF.7
43		Flex Day - EDM Games and Centers		58		Flex Day - EDM Games and Centers	
44	2.14	Unit 2 Progress Check - Day 2		59	3.11	Tenths and Hundredths of a Meter	4.NF.6, 4.NF.7, 4.MD.1
45	3.1	Equal Sharing and Equivalence	4.NF.1, 4.NF.2, 4.MD.2	60	3.12	Tenths of a Centimeter	4.OA.2, 4.NF.6, 4.NF.7, 4.MD.1, 4.MD.2

Day	Unit & Lesson	Topic / Activity	NJSLS-M	Day	Unit & Lesson	Topic / Activity	NJSLS-M
61	3.13	Comparing Decimals	4.NF.6, 4.NF.7, 4.MD.2	76	4.8	Money Number Stories	4.NBT.2, 4.NBT.4, 4.NBT.5, 4.MD.1, 4.MD.2
62		Unit 3 Review		77	4.9	Partial-Products Multiplication	4.NBT.2, 4.NBT.4, 4.NBT.5,
63	3.14	Unit 3 Progress Check - Day 1		78	4.10.	Multiplication Wrestling	4.NBT.2, 4.NBT.4, 4.NBT.5
64		Flex Day - EDM Games and Centers		79		Flex Day - EDM Games and Centers	
65	3.14	Unit 3 Progress Check - Day 2		80	4.11	Area Models for Rectangles and Rectilinear Figures	4.NBT.4, 4.NBT.5, 4.MD.3, 4.G.2
66	4.1	Extended Multiplication Facts	4.OA.2, 4.NBT.1, 4.NBT.5	81	4.12	Multistep Multiplication Number Stories	4.OA.3, 4.NBT.3, 4.NBT.4, 4.NBT.5
67	4.2	Making Reasonable Estimtes for Products	4.OA.3, 4.NBT.3, 4.NBT.4, 4.NBT.5	82	4.13	Lattice Multiplication	4.NBT.5
68	4.3	Partitioning Rectangles	4.NBT.2, 4.NBT.4, 4.NBT.5, 4.MD.3	83		Unit 4 Review	
69		Flex Day - EDM Games and Centers		84	4.14	Unit 4 Progress Check - Day 1	
70	4.4	Converting Liquid Measures	4.NBT.4, 4.NBT.5, 4.NBT.6, 4.MB.1, 4.MD2	85		Flex Day - EDM Games and Centers	
71	4.5	Open Response: Walking Away with a Million Dollars - Day 1	4.NBT.1, 4.NBT.5	86	4.14	Unit 4 Progress Check - Day 2	
72	4.5	Open Response: Walking Away with a Million Dollars - Day 2	4.NBT.1, 4.NBT.5	87	5.1	Fraction Decomposition	4.NBT2, 4.NBT4, 4.NBT5
73	4.6	Introducing Partial-Products Multiplication	4.NBT.2, 4.NBT.4, 4.NBT.5, 4.MD.3	88	5.2	The Whole For Fractions	4NBT5, 4NBT5
74		Flex Day - EDM Games and Centers		89	5.3	Adding Fractions	4.NBT.4, 4.NBT.5 ,4.NF.1
75	4.7	Metric Units of Mass	4.NBT.4, 4.NBT.5, 4.NBT.6, 4.MD.1, 4.MD.2	90	5.4	Adding Mixed Numbers	4.NF.3.a, 4.NF.3.b, 4.NF.3.c, 4.NF.3.d

Day	Unit & Lesson	Topic / Activity	NJSLS-M	Day	Unit & Lesson	Topic / Activity	NJSLS-M
91	90		Flex Day - EDM Games and	106	5.14.	Unit 5 Review	
92	District Assess	Math Midyear Assessment		107	5.14.	Unit 5 Progress Check-Day 1	
93	District Assess	Math Midyear Assessment		108	5.14.	Unit 5 Progress Check-Day 2	
94	5.5	Adding Tenths and Hundredths	4.NF.3.a, 4.NF.5, 4.NF.6	109		Flex Day - EDM Games and Centers	
95	5.6	Open Response Queen Arlene's Dilemma (Day 1)	4.NF.3.a , 4.NF.3.b, 4.OA.1	110	6.1	Extended Division Facts	4.NBT.1, 4.NBT.5, 4.NBT.6
96	5.6	Open Response Queen Arlene's Dilemma (Day 2)	4.NF.3.a, 4.NF.3.b, 4.NF.3.d	111	6.2	Area: Finding Missing Side Lengths	4.MD.3, 4.NBT.4, 4.NBT.5, 4.NBT.6
97	5.7	Subtracting Fractions	4.NF.3.a, 4.NF.3.b, 4.NF.3.d	112	6.3	Strategies for Division	4.NBT.6, 4.OA.4
98		Flex Day - EDM Games and Centers		113	6.4	Partial-Quotients Division, Part 1	4.MD.3, 4.MD.3, 4.NBT.4, 4.NBT.5, 4.NBT.5
99	5.8	Subtracting Mixed Numbers	4.NF.3.a, 4.NF.3.b, 4.NF.3.c, 4.NF.3.d	114		Flex Day - EDM Games and Centers	
100	5.9	Line Plots	4.MD.4	115	6.5	Open Response Fruit Baskets (Day 1)	4.NBT.6, 4.OA.3
101	5.10.	Rotations and Iterating Angles	4.G.1, 4.MD.5.a, 4.MD.5.b	116	6.5	Fruit Baskets (Day 2)	4.NBT.6, 4.OA.3
102	5.11.	Unit Iteration for Angles	4.G.1, 4.MD.5.a, 4.MD.5.b	117	6.6	Customary Units of Weight	4.NBT.5
103		Flex Day - EDM Games and Centers		118	6.7	Partial-Quotients Division, Part 2	4.NBT.2, 4.NBT.3, 4.NBT.6, 4.OA.4
104	5.12.	Creating Symmetric Figures	4.G.3	119		Flex Day - EDM Games and Centers	
105	5.13.	More Multistep Multiplication Number Stories	4.NBT.3, 4.NBT.4, 4.NBT.5, 4.OA.3	120	6.8	Expressing and Interpreting Remainders	4.NBT.6 , 4.OA.3

Day	Unit & Lesson	Topic / Activity	NJSLS-M	Day	Unit & Lesson	Topic / Activity	NJSLS-M
121	6.9	Measuring Angles	4.MD.5.a, 4.MD.5.b, 4.MD.6	136	NJSLSA-M	**NJSLSA-M Review Day 1**	
122	6.10.	Using a Half-Circle Protractor	4.G.1, 4.MD.5, 4.MD.5.b, 4.MD.5.c	137	NJSLSA-M Review	**NJSLSA-M Review Day 2**	
123	6.11.	Angle Measures as Additive	4.MD.5.b , 4.MD.6 , 4.MD.7 , 4.NBT.4	138	NJSLSA-M	**NJSLSA-M Testing**	
124		Flex Day - EDM Games and Centers		139	NJSLSA-M	**NJSLSA-M Testing**	
125	6.12.	Number Stories with Fractions and Mixed Numbers	4.MD.2, 4.NF.3.a, 4.NF.3.b, 4.NF.3.c, 4.NF.3.d	140	NJSLSA-M	**NJSLSA-M Testing**	
126	6.13.	Extending Understandings of Whole Number Multiplication	4.NBT.5, 4.NF.4.b, 4.NF.4.c	141	NJSLSA-M	**NJSLSA-M Testing**	
127		Unit 6 Review		142	NJSLSA-M	**NJSLSA-M Testing**	
128	6.14.	Unit 6 Progress Check- Day 1		143	7.5	Multiplying Mixed Numbers by Whole Numbers	4.MD.1, 4.MD.2, 4.NF.4.b, 4.NF.4.c
129	6.14.	Unit 6 Progress Check- Day 2		144	7.6	Open Response Three-Fruit Salad (Day 1)	4.NF.3.a, 4.NF.4.b, 4.NF.4.c
130		Flex Day - EDM Games and Centers		145	7.6	Open Response Three-Fruit Salad (Day 2)	4.NF.4.c
131	7.1	Converting Liquid Measures: U.S. Customary Units	4.MD.1, 4.MD.2, 4.NBT.4, 4.NBT.5, 4.NBT.6	146	7.7	Multistep Division Number Stories	4.NBT.4, 4.NBT.6, 4.OA.3
132	7.2	Exploring Fraction Multiplication Situations	4.MD.1, 4.MD.2, 4.NF.2	147		Flex Day - EDM Games and Centers	
133	7.3	A Fraction as a Multiple of a Unit Fraction	4.NF.4.a, 4.NF.4.b, 4.NF.4.c	148	7.8	Division Measurement Number Stories	4.MD.1, 4.MD.2, 4.NBT.5, 4.NBT.6
134	7.4	Multiplying Fractions by Whole Numbers	4.NF.4.a, 4.NF.4.b, 4.NF.4.c	149	7.9	Generating and Identifying Patterns	4.MD.3, 4.NBT.6, 4.OA.5
135		Flex Day - EDM Games and Centers		150	7.10.	Solving Multistep Fraction Number Stories	4.MD.1, 4.MD.2, 4.NF.2, 4.NF.4.c

Day	Unit & Lesson	Topic / Activity	NJSLS-M	Day	Unit & Lesson	Topic / Activity	NJSLS-M
151	7.11.	Weights of State Birds	4.MD.1, 4.MD.2, 4.NF.3.c, 4.NF.3.d, 4.NF.4.b, 4.NF.4.c	166	8.7	More Decimal Number Stories	4.NF.5, 4.NF.6
152	7.12.	Decimal Number Stories	4.NF.3.a, 4.NF.3.c, 4.NF.3.d, 4.NF.4.b, 4.NF.4.c, 4.NF.6	167	8.8	Areas of Rectangles with Fractional Side Lengths	4.G.1, 4.G.3, 4.MD.2, 4.MD.3, 4.NBT.2, 4.NF.2, 4.NF.3.a, 4.NF.3.c, 4.NF.3.d, 4.NF.4.b, 4.NF.4.c, 4.NF.5, 4.NF.6, 4.OA.3
153		Flex Day - EDM Games and Centers		168	8.9	More Fraction Multiplication Number Stories	4.NF.2
154	7.13.	Displaying Insect Data	4.MD.4, 4.NF.3.a, 4.NF.3.c	169	8.10.	Fractions and Liquid Measures	4.MD.1, 4.MD.2, 4.NBT.2, 4.NBT.3 , 4.NBT.4, 4.NBT.5, 4.NBT.6, 4.NF.2
155		Unit 7 Review		170		Flex Day-EDM Games and Centers	4.NF.3.a, 4.NF.3.c, 4.NF.3.d, 4.NF.4.b, 4.NF.4.c, 4.OA.3
156	7.14.	Unit 7 Progress Check-Day 1		171	8.11.	Fractions and Measurement	4.MD.1, 4.MD.2, 4.MD.5.a, 4.MD.5.b, 4.MD.6, 4.MD.7, 4.NBT.4,
157	7.14	Unit 7 Progress Check-Day 2		172	8.12.	Applying Understandings of Place Value and Operations	4.NBT.4
158	8.1	Extending Multistep Number Stories	4.NBT.4, 4.NBT.5, 4.NBT.6	173	8.13	Many Names for Numbers	4.NBT.4, 4.NBT.5, 4.NBT.6, 4.NF.1, 4.NF.5, 4.NF.5
159	8.2	Real-Life Angle Measures as Additive	4.MD.6, 4.MD.7, 4.NBT.4	174		Unit 8 Review	
160		Flex Day - EDM Games and Centers		175	8.14	Unit 8 Progress Check-Day 1	
161	8.3	8-3 Open Response Pattern-Block Angles (Day 1)	4.MD.7	176	8.14.	Unit 8 Progress Check-Day 2	
162	8.4	Extending Line Symmetry	4.G.3	177	District Assess	**Math Final Exam**	
163	8.5	Line Plots: 1/2, 1/4, and 1/8 Inches	4.MD.4	178		Flex Day-EDM Games and Centers	
164	8.6	Fractions and Perimeter	4.MD.2, 4.MD.3	179		Flex Day-EDM Games and Centers	
165		Flex Day - EDM Games and Centers		180		**Last Day of School**	

Unit Plan Title	Place Value; Multi-digit Addition and Subtraction
Suggested Time Frame	20 days including flex days

Stage 1: Desired Results

Overview / Rationale

In this unit, students explore place value concepts for multi-digit whole numbers. They use U.S. traditional addition and subtraction to add and subtract multi-digit whole numbers. Student learning will focus on four clusters of the NJ Student Learning Standards for Math (NJSLS-M), Operations and Algebraic Thinking, Number and Operations in Base Ten, Measurement and Data, and Geometry.

Standards

4.OA.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.

4.NBT.1 - Recognize that in a multi-digit whole number; a digit in the one place represents ten times what it represents in the place to its right.

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.

4.MD.1 -Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr., min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.

4.MD.3 - Apply the area and perimeter formulas for rectangles in real world and mathematical problems.

4.G.1 - Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

Technology Integration
__X__ **8.1 Educational Technology:** All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
- Student Websites - Teacher Websites - SMART board
____**8.2 Technology Integration, Engineering, Design and Computational Thinking – Programming** All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

INTEGRATED SOCIAL AND EMOTIONAL LEARNING COMPETENCIES
The following social and emotional competencies are integrated in this curriculum document:

Self-Awareness
_____Recognize one's own feelings and thoughts
_____Recognize the impact of one's feelings and thoughts on one's own behavior
_____Recognize one's personal traits, strengths and limitations
_____Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management
__x__Understand and practice strategies for managing one's own emotions, thoughts and behaviors
__x__Recognize the skills needed to establish and achieve personal and educational goals
__x__Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness
__x__Recognize and identify the thoughts, feelings, and perspectives of others
_____Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
_____Demonstrate an understanding of the need for mutual respect when viewpoints differ
_____Demonstrate an awareness of the expectations for social interactions in a variety of setting

Responsible Decision Making
__x__Develop, implement and model effective problem solving and critical thinking skills
_____Identify the consequences associated with one's action in order to make constructive choices
_____Evaluate personal, ethical, safety and civic impact of decisions

Relationship Skills
_____Establish and maintain healthy relationships
__x___Utilize positive communication and social skills to interact effectively with others
_____Identify ways to resist inappropriate social pressure
_____Demonstrate the ability to present and resolve interpersonal conflicts in constructive ways
_____Identify who, when, where, or how to seek help for oneself or others when needed

In this unit plan, the following 21st Century Life and Careers skills are addressed:				
Check ALL that apply – **21st Century Themes**			**Indicate whether these skills are:** ● **E – encouraged** ● **T – taught** ● **A – assessed** **Career Ready Practices**	
9.1	**Personal Financial Literacy**		E	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		TA	CRP2. Apply appropriate academic and technical skills.
X	Money Management			CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management		ET A	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing			CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer			CRP6. Demonstrate creativity and innovation.
X	Civic Financial Responsibility			CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		ET A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	**Career Awareness, Exploration, and Preparation**			CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		E	CRP11. Use technology to enhance productivity.
	Career Preparation			CRP12. Work productively in teams while using cultural global competence.

Interdisciplinary Connections

Other standards covered:

RI.4.3 - Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

RI.4.4 - Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a *grade 4 topic or subject area*.

RI.4.7 - 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.

SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly

Essential Questions	**Enduring Understandings**
● What is the importance of place value? ● What makes a computational strategy both effective and efficient? ● How do operations affect numbers? ● What are properties of polygons? ● When should an estimate be given in place of an exact answer?	***Students will understand that…*** ● Determining the best solution; an exact answer or an estimate. ● Solving number stories using different operations and strategies. ● Use of U.S Customary units of measurement for different purposes.
Student Learning Targets / Objectives	
Students will know...	***Students will be able to…***
• Place value in whole numbers through hundred-thousands • How to record numbers in expanded form • Compare number through the hundred-thousands • Procedures for rounding numbers through hundred-thousands • Different ways to estimate • How to solve multistep addition and subtraction numbers stories • U.S. traditional addition • How to use place value structures to solve code based problems • U.S. traditional subtraction • Conversions between yards, feet, inches • Properties of points, line segments, lines and rays • Properties of angles, triangles, and quadrilaterals • The formula for finding the perimeter of a rectangle.	• Make sense of addition and subtraction multistep number stories and estimate to generate a reasonable answer to a problem before solving • Recognize the relationship between the value of a place (under 1,000) that is ten times as large as the value of another place • Read and identify places in numbers using a tool • Use place value to read numbers in expanded form • Compare and order multi-digit whole numbers by the two largest places in the number through hundred-thousands • Round numbers through the millions to the two largest places • Apply U.S. traditional addition and subtraction to 3-digit + 3-digit and 3-digit - 3 digit problems • Explain the relationship between and convert from yards to feet and feet to inches • Have a strategy to determine the perimeter • Draw and label points, lines, line segments, and rays with help from the Student Reference Book • Correctly identify right angles.

Stage 2: Acceptable Evidence

Assessments	
Formative Assessments: ● Assessment Check-In ● Mental Math and Fluency ● Exit Slips/Slate Assessments ● Informal Observations ● Math Journal ● Home Links ● EDM Games ● Self-Assessment ● Questioning	**Summative Assessments:** ● Beginning of the Year Assessment ● Unit Progress Check ● Open Response ● Quizzes ● Tests ● Student Work Products

Stage 3: Learning Experiences

Lesson 1-1 Place Value in Whole Numbers

Standards: 4.NBT.1, 4.NBT.2, 4.NBT.5

Warm Up / Mental Math and Fluency: Solve addition problems

Focus:

- **Math Message** - Write the largest and smallest numbers possible.
- **Exploring Place Value** - Students are introduced to place value in the ten- and hundred-thousand and explore relationships between values
- **Reading and Writing Big Numbers** - Read and write numbers and identify values through the hundred-thousand place

Practice:

- **Game: Addition Top-It** (Advanced Version) - Practice multi-digit addition
- **Math Boxes** 1-1: MJ1 page 3
- **Home Link** 1-1: Family Letter introduces Everyday Mathematics & Unit 1

Assessment: Observe students working on MJ1 page 2. Expect most to be able to identify values of digits

Differentiation Options:

- **Readiness:** Using a place value tools; students work with a Compact Place-Value Flip Book
- **Enrichment:** Solving number grid puzzles to further explore the base-10 value system
- **Extra Practice:** Building paper place value models to practice understanding place value in large numbers up to 10,000
- **Activity Card(s):** 1
- **ELL Support**: Use “think aloud” to familiarize students with terms digit and value. Show numbers with digits and base-10 blocks

Lesson 1-2 Place-Value Concepts

Standards: 4.NBT.1, 4.NBT.2

Warm Up / Mental Math and Fluency: Solve subtraction problems

Focus:
- **Math Message**: Compare large numbers
- **Writing Numbers in Expanded Form**: Explore writing numbers in expanded form
- **Comparing and Ordering Numbers**: Examine the values of digits to compare and order large numbers
- **Game**: **Number Top-It**: Compare numbers through the hundred thousands

Practice:
- **Game: Subtraction Top-It** (Advanced Version): Practice multi-digit subtraction
- **Math Boxes** 1-2: MJ1 page 6
- **Home Link** 1-2: Compare numbers in the hundred-thousands

Assessment: Observe students completing MJ1 page 4. Expect most students to be able to correctly solve problems 1-4.

Differentiation Options:
- **Readiness**: Building, expanding and comparing numbers by building with base-10 blocks and then write the numbers in expanded form
- **Enrichment**: Apply understanding of place-value concepts by collecting large numbers
- **Extra Practice:** Practice place-value concepts by using number cards to create 6-digit numbers
- **Activity Cards:** 2-3
- **ELL Support**: Relate the meaning of *expand* to the idea of "stretching out." Incorporate visuals. Use numbers written in standard form as well as base-10 blocks to show how numbers get stretched out or expanded

Lesson 1-3 Formal Procedures for Rounding

Standards: 4.NBT.2, 4.NBT.3

Warm Up / Mental Math and Fluency: Identify the values of digits

Focus:
- **Math Message:** Make sense of rounding procedures
- **Exploring Rounding Procedures:** Learn procedures for rounding numbers
- **Rounding to the Nearest 10,000**: Apply rounding procedures to numbers in the thousands and ten-thousands
- **Game - Spin-and-Round:** Practice rounding number through the hundred-thousands

Practice:
- **Game - Addition Top-It** (Advanced Version): - Practice multi-digit addition
- **Math Boxes** 1-3: MJ1 page 8
- **Home Link** 1-3: Use data to practice rounding numbers through the hundred-thousand's place

Assessment: Observe students completing MJ1 page 7. Expect most to be able to accurately round numbers to the largest place in problems 4, 5a-c, and 6a-c.

Differentiation Options:
- **Readiness:** Finding the halfway point on number lines for experience locating numbers on a number line
- **Enrichment:** Rounding data on a bar graph to practice visually rounding numbers
- **Extra Practice:** Rounding whole numbers by rounding to the given place on MM page 14 and explain rounding procedures
- **ELL Support:** Provide visual support for understanding of rounding by using number line and gestures to model

Lesson 1-4 Introduction to the *Student Reference Book*

Standards: 4.NBT.1, 4.NBT.2, 4.NBT.3, 4.NBT.5

Warm Up / Mental Math and Fluency: Write the values of digits

Focus:
- **Math Message:** Explore the *Student Reference Book (SRB)*
- **Investigating the *Student Reference Book:*** Explore sections of the *SRB*
- **Extending Place Value:** Read about and compare populations
- **Game - Fishing for Digits:** Identify and express the values of digits in whole numbers

Practice:
- **Game - Subtraction Top-It** (Advanced Version): Practice multi-digit subtraction
- **Math Boxes** 1-4: MJ1 page 10, Place Value Flip Book
- **Home Link** 1-4: Compare and order data

Assessment: Check In - MJ1 page 9; Expect students to correctly identify numbers and values of digits through the hundred-thousands in problems 1 and 3.

Differentiation Options:
- **Readiness:** Comparing and rounding numbers by showing 6-digit numbers on Place-Value Flip Books and recording results on MM page 16
- **Enrichment:** Exploring Big Numbers in mentor text How Much is a Million?
- **Extra Practice:** Ordering U.S. cities by population to practice ordering large numbers less than 500,000. Record work and discuss strategies
- **Activity Cards:** 4-5
- **ELL Support:** Familiarize students with terms associated with table of contents. Using *SRB* find keywords in table of contents

Lesson 1-5 Estimation Strategies

Standards: 4.OA.3, 4.NBT.3, 4.NBT.4

Warm Up / Mental Math and Fluency: Answer questions about the values of digits

Focus:
- **Math Message**: Estimate a solution to a multistep number story
- **Identifying Reasons for Everything:** Consider reasons for estimating
- **Exploring Different Ways to Estimate:** Consider rounding, front-end estimation, and close-to estimation
- **Practicing Estimating:** Estimate solutions to multistep addition and subtraction number stories

Practice:
- **Game - Number Top-It:** Compare numbers through the hundred thousands
- **Math Boxes** 1-5: MJ1 page 12
- **Home Link** 1-5: Estimate solutions to multistep number stories and explain their estimation strategy

Assessment: MJ1 page 11; Most students should be able to choose one of the strategies and arrive at a reasonable estimate.

Differentiation Options:
- **Readiness:** Rounding with base-10 blocks to help students with estimation and rounding
- **Enrichment:** Planning a balanced meal by reading weekly grocery store advertisements and using given budget to plan meal
- **Extra Practice:** Estimating in everyday life by reading mentor text *Betcha!* Estimating and discussing methods and using similar tasks.
- **Activity Cards:** 6-7
- **ELL Support:** Show pictures to familiarize students with some of the vocabulary in number stories for the lesson. Pair non-native English speakers with native speakers for completing journal pages.

Lesson 1-6 Guide to Solving Number Stories

Standards: 4.OA.3, 4.NBT.4

Warm Up / Mental Math and Fluency: Estimate sums

Focus:
- **Math Message:** Solve a multistep number story
- **Using the Guide to Solve Number Stories:** Review and apply an approach that can be used to solve a number story
- **Solving Multistep Number Stories:** Solve addition and subtraction number stories

Practice:
- **Game: Spin-and-Round:** Practice rounding through hundred-thousands place
- **Math Boxes** 1-6: MJ1 page 15
- **Home Link** 1-6: Solve multistep number stories

Assessment: Check In - MJ1 pages 13-14; This is the first exposure to this content in Grade 4. Expect students to successfully solve problem 2 on page 13.

Differentiation Options:
- **Readiness:** Reviewing situation diagrams to model number stories and solve then record number model representing the steps
- **Enrichment:** Writing multistep number stories to explore strategies for solving number stories. Students will write number stories for partner to solve
- **Extra Practice:** Solving number stories; estimate, solve and record number models
- **Activity Cards**: 8
- **ELL Support:** Prior to lesson work through the Guide to Solving Number Stories using simple problems, gestures, and visuals.

Lesson 1-7 U.S. Traditional Addition

Standards: 4.OA.3, 4.NBT.2, 4.NBT.4

Warm Up / Mental Math and Fluency: Solve addition problems

Focus:
- **Math Message:** Solve addition problems
- **Reviewing Addition Strategies:** Share strategies for solving addition problems
- **Introducing U.S. Traditional Addition:** Introduction to U.S. traditional addition
- **Comparing Addition Strategies**: Compare partial-sums addition, column addition, and U.S. traditional addition

Practice:
- **Math Boxes** 1-7: MJ1 page 18
- **Home Link** 1-7: Solve addition problems using U.S. traditional addition

Differentiation Options:
- **Readiness:** Reviewing column addition using base-10 blocks to model each step
- **Enrichment:** Solving number tile addition problems to further explore estimation and computation
- **Extra Practice:** Adding it up; for more practice with U.S traditional addition partners for addends with number cards then solve. Use calculator to check answers.
- **Activity Cards:** 9
- **ELL Support:** Use Total Physical Response protocols along with base-10 blocks to introduce the term *trade* and provide oral practice using term,

Lesson 1-8 (2-day lesson) Cracking the Muffin Code

Standards: 4.OA.5, 4.NBT.1

Warm Up / Mental Math and Fluency: Provide the next number in a sequence

Focus:
- **Math Message:** Group bagels into boxes of 25, 5, and 1
- **Discussing Grouping by 25s, 5s, and 1s:** Discuss what it means to group bagels into boxes of 25, 5, and 1
- **Solving the Open Response Problem:** Use mathematical patterns and structures to decipher codes based on place-value systems

Focus:
- **Setting Expectations:** Review the open response problem and discuss what a good response might include. Establish guidelines for discussing others' work respectfully
- **Reengaging in the Problem:** Analyze others' work, compare coding systems, and think about how they are like our base-10 place-value system
- **Revising Work:** Revise answers and explanations

Practice:
- **Math Boxes** 1-8: MJ1 page 20
- **Home Link** 1-8: Students solve problems using groups of 10

Assessment: Open Response; collect and review students' revised work. Expect students to improve their work based on the class discussion

Differentiation Options:
- **Adjusting the activity:** For students who wrote complete and correct explanations on Day 1, provide question of needing larger box
- **ELL Support:** Prior to lesson use role-play activities in conjunction with Total Physical Response commands, models, or drawings to introduce students to context of packing muffins into boxes at a bakery. Use commands or questions to be sure students know the problem contexts.

Lesson 1-9 U.S. Traditional Subtraction

Standards: 4.OA.3, 4.NBT.2, 4.NBT.4

Warm Up / Mental Math and Fluency: Use the counting-up strategy to solve subtraction problems

Focus:

- **Math Message:** Solve subtraction problems
- **Reviewing Subtraction Strategies:** Share strategies for solving subtraction problems
- **Introducing U.S. Traditional Subtraction:** Introduction to U.S. traditional subtraction
- **Comparing Subtraction Strategies:** Comparing counting-up, trade-first, and U.S. traditional subtraction strategies

Practice:

- **Math Boxes** 1-9: MJ1 page 23
- **Home Link** 1-9: Solve subtraction problems using U.S. traditional subtraction

Assessment: MJ1 page 21. Observe students as they work on page 21. Expect most students to attempt to use U.S traditional subtraction for all the journal problems on the page, and solve problems 1 and 2 correctly.

Differentiation Options:

- **Readiness**: Reviewing trade-first to provide experience with multi-digit subtraction
- **Enrichment**: Solving the number tile subtraction problems to further explore estimation and computation
- **Extra Practice:** Finding the difference to practice with U.S. traditional subtraction **using number cards.**
- **Activity Cards:** 10
- **ELL Support:** Demonstrate the meaning of columns on a grid using gestures to show up and down as you say the term. Have students trace with fingers. Show examples.

Lesson 1-10 U.S. Customary Units of Length

Standards: 4.NBT.3, 4.NBT.4, 4.NBT.5, 4MD.1, 4.MD.2

Warm Up / Mental Math and Fluency: Estimate differences

Focus:
- **Math Message:** Convert yards to feet and feet to inches
- **Measuring Length ins U.S Customary Units:** Examine measurement scales and convert from larger to smaller units
- **Converting Yards, Feet, and Inches:** Convert U.S. customary measures of length
- **Solving U.S Customary Length Number Stories:** Solve number stories involving units of length

Practice:
- **Games - Spin-and-Round:** Practice rounding numbers through the hundred thousands
- **Math Boxes** 1-10: Preview for Unit 2 - MJ1 page 26
- **Home Link** 1-10: Convert U.S. customary units of length

Assessment: MJ1 page 24; Observe students solving problems 1-4. Expect them to be able to convert yards to feet and feet to inches when given the relationships

Differentiation Options:
- **Readiness:** Finding personal references for inches, feet, and yards for experience in estimating lengths. Record personal references.
- **Enrichment:** Converting measures of migratory bird data to further explore converting measure of U.S customary units of length
- **Extra Practice:** Converting measure of length to practice converting measures to other units. Teacher created conversion problems
- **Activity Cards:** 11
- **ELL Support:** Preview terms *yard, foot*, and *inch* by displaying a yardstick, ruler, and one inch piece of paper. Have students identify by pointing to the units

Lesson 1-11 Points, Line Segments, Lines, and Rays

Standards: 4.G.1

Warm Up / Mental Math and Fluency: Write numbers in standard form

Focus:
- **Math Message:** List places where geometry can be found
- **Identifying Points, Line Segments, Lines, and Rays:** Look for classroom geometric shapes and patterns and identify parallel lines, line segments, and rays in figures
- **Identifying Parallel Lines, Line Segments, and Rays in Figures:** Identify parallel lines, line segments, and rays in figures

Practice:
- **Game - Number Top-It:** Compare numbers through the hundred-thousands
- **Math Boxes** 1-11: MJ1 page 28
- **Home Link** 1-11: Identify line segments, lines, and rays

Assessment: MJ1 page 27; Expect most students to be able to correctly draw and label line segments, lines, and rays in problems 1a, 2a, and 3a

Differentiation Options:
- **Readiness**: Modeling line segments for experience using a concrete model to work with the characteristics of line segments, students make line segments on a geoboard.
- **Enrichment:** Solving a collinear-points puzzle to further explore characteristics of lines, students solve puzzles involving collinear points.
- **Extra Practice:** Game: Geometry Concentration (Part 1) - practice with the names and definitions of geometric figures by matching cards
- **Activity Cards:** 12
- **ELL Support:** Use visuals and labels to help students learn geometry terms. Prepare displays of illustrated terms: *points, line* segment, endpoints, *line*, ray, and *parallel lines*. Give each student his or her own set of illustrated terms as well. Say each term, point to it, and have students find it in their set and touch it.

Lesson 1-12 Angles, Triangles, and Quadrilaterals

Standards: 4.G.1, 4.G.2

Warm Up / Mental Math and Fluency: Round numbers

Focus:
- Math Message: Make a geometric shape or design.
- Building Angles: Build and identify right, obtuse, and acute angles.
- Building Triangles and Quadrilaterals: Construct right triangles and quadrilaterals.
- Drawing and Naming Angles: Practice drawing and naming angles.

Practice:
- **Games - Addition Top-It** (Advanced Version): Practice multi-digit addition.
- **Math Boxes** 1-12: MJ1 page 30
- **Home Link** 1-12: Students draw and describe properties of angles, right triangles, and quadrilaterals

Assessment: MJ1 page 29; Expect most students to be able to correctly identify the angle as a right angle in Problem 5a. Have students who struggle trace with their finger a variety of right angles, including some found in real objects. Do not expect students to be able to distinguish between obtuse and acute angles.

Differentiation Options:
- **Readiness:** Sorting pattern blocks to explore properties of quadrilaterals
- **Enrichment:** Solving a polygon puzzle to further explore the properties of rectangles, triangles, and squares
- **Extra Practice Game: Geometry Concentration** (Part 2) - Practice with names and definitions of geometric figures by matching cards
- **Activity Cards**: 13
- **ELL Support**: Use visuals and labels to help students learn geometry vocabulary. Prepare displays to illustrate the following terms: *angle, vertex, right angle, acute angle,* and *obtuse angle*. Give individual students their own set of displays as well. As you say a term and point to the illustration, have them find the same one in their sets and touch it.

Lesson 1-13 Finding Perimeters of Squares and Rectangles

Standards: 4.NBT.4, 4.NBT.5, 4.MD.1, 4.MD.3, 4.G.2

Warm Up / Mental Math and Fluency:: Write numbers in standard notation

Focus:
- **Math Message:** Find the perimeter of a square
- **Developing Formulas for the Perimeter of Rectangles:** Learn formulas for finding a rectangle's perimeter
- **Finding Perimeters of Objects:** Select and measure the perimeters of objects
- **Solving Perimeter Problems:** Apply perimeter formulas

Practice:
- **Games - Fishing for Digits:** Identify and express values of digits
- **Math Boxes** 1-13: MJ1 page 31
- **Home Link** 1-13: Find perimeters of objects

Assessment: MJ1 page 33; Observe students completing page33. Expect most to have a strategy for finding the perimeters of the rectangles.

Differentiation Options:
- **Readiness:** Investigating Perimeters on a Geoboard; For experience working with perimeters using a concrete model, students construct rectangles and squares of a given perimeter on a geoboard and record side lengths
- **Enrichment:** Investigating Pattern-Block Perimeters to further explore perimeter concepts by creating polygons with as many different perimeters as possible
- **Extra Practice:** For practice with perimeter concepts, students construct as many rectangles as possible with a perimeter of 24 centimeters. Have them draw and label their shapes
- **Activity Cards:** 14-15
- **ELL Support**: Prior to the lesson, display a 2-foot × 1-foot rectangle with labeled side lengths. Trace the outside of the shape with your finger as you say: *This is the* perimeter *of the rectangle.* Repeat the gesture, adding the lengths of the sides as you trace them. Repeat with other rectangles, including rectangular objects. Use tape to create a rectangle on the floor. As students walk along the shape, say: *You are walking along the perimeter.* As students complete the journal pages, encourage them to use the word *perimeter* when appropriate.

Lesson 1-14 (2-day lesson) Unit 1 Progress Check
Standards: 4.OA.3, 4.NBT.2, 4.NBT.3, 4.NBT.4, 4.NBT.5, 4,.MD.1, 4.MD.3, 4.G.1 **Warm Up / Self-Assessment:** complete the Self-Assessment. **Assessment:** ● **Unit 1 Assessment:** These items reflect mastery expectations to this point ● **Unit 1 Challenge** (Optional): Students may demonstrate progress beyond expectations ● **Solving the Open Response Problem:** Make sense of and describe two strategies for solving the same multi-digit subtraction problem ● **Discussing the Problem:** The class discusses students' explanations **Look Ahead:** ● **Math Boxes** 1-14: Preview for Unit 2 - MJ1 page 34 ● **Home Link** 1-14: Students take home the Family Letter that introduces Unit 2 **Differentiation Options:** Adjusting the Assessment - See TE for adjustments to the assessment

Student Resources	
Print	Student Math Journal Volume 1 Student Reference Book
Print/Online	Activity Cards EM Games Online
Online	● http://www.abcya.com ● http://www.coolmath-games.com/

Teacher Resources	
Print	Teacher's Lesson Guide Volume 1
Print/Online	Spiral Tracker Math Masters Assessment Handbook
Literature Link	How Much is a Million? (optional)
Online	● eToolkit ● ePresentations ● http://www.internet4classrooms.com/common_core/fourth_4th_grade_math_mathematics.htm ● http://www.mathblaster.com/teachers/math-worksheets/place-value ● https://www.ixl.com/math/grade-4

Unit Plan Title	Multiplication and Geometry
Suggested Time Frame	20 days including flex days

Stage 1: Desired Results

Overview / Rationale

In this unit, students explore various application for multiplication. They classify shapes by properties and develop formulas for finding the area of a rectangle. Student learning will focus on three clusters of the NJ Student Learning Standards for Math (NJSLS-M), Operations and Algebraic Thinking, Number and Operations in Base Ten, and Geometry.

Standards

4.OA.1 - Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

4.OA.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.OA.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.

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.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.

Technology Integration
__X__ **8.1 Educational Technology:** All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
- Student Websites - Teacher Websites - SMART board
____ **8.2 Technology Integration, Engineering, Design and Computational Thinking – Programming** All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

INTEGRATED SOCIAL AND EMOTIONAL LEARNING COMPETENCIES
The following social and emotional competencies are integrated in this curriculum document:

Self-Awareness
_____Recognize one's own feelings and thoughts
_____Recognize the impact of one's feelings and thoughts on one's own behavior
_____Recognize one's personal traits, strengths and limitations
_____Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management
__x__Understand and practice strategies for managing one's own emotions, thoughts and behaviors
__x__Recognize the skills needed to establish and achieve personal and educational goals
__x__Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness
__x__Recognize and identify the thoughts, feelings, and perspectives of others
_____Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
_____Demonstrate an understanding of the need for mutual respect when viewpoints differ
_____Demonstrate an awareness of the expectations for social interactions in a variety of setting

Responsible Decision Making
__x__Develop, implement and model effective problem solving and critical thinking skills
_____Identify the consequences associated with one's action in order to make constructive choices
_____Evaluate personal, ethical, safety and civic impact of decisions

Relationship Skills
_____Establish and maintain healthy relationships
__x__Utilize positive communication and social skills to interact effectively with others
_____Identify ways to resist inappropriate social pressure
_____Demonstrate the ability to present and resolve interpersonal conflicts in constructive ways
_____Identify who, when, where, or how to seek help for oneself or others when needed

In this unit plan, the following 21st Century Life and Careers skills are addressed:				
Check ALL that apply – **21st Century Themes**			**Indicate whether these skills are:** ● **E – encouraged** ● **T – taught** ● **A – assessed** **Career Ready Practices**	
9.1	**Personal Financial Literacy**		E	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		TA	CRP2. Apply appropriate academic and technical skills.
X	Money Management			CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management		ETA	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing			CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer			CRP6. Demonstrate creativity and innovation.
X	Civic Financial Responsibility			CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		ETA	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	**Career Awareness, Exploration, and Preparation**			CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		E	CRP11. Use technology to enhance productivity.
	Career Preparation			CRP12. Work productively in teams while using cultural global competence.

Interdisciplinary Connections

Other standards covered:

RI.4.3 - Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

RI.4.4 - Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a *grade 4 topic or subject area*.

RI.4.7 - 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.

SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly

Essential Questions:	**Enduring Understandings:**
● Why is it important to identify patterns in numbers? ● How do operations affect numbers? ● How does multiplication help in solving number stories?	***Students will understand that…*** ● Show that multiplication is repeated addition. ● Use properties of polygons to classify. ● Analyze patterns in mathematical situations. ● Use various operations and strategies to solve number stories.
Knowledge:	**Skills:**
Students will know… ● Square number patterns ● The formula for the area of a rectangle ● Factors and factor pairs ● That a whole number is a multiple of each of its factors ● Prime and composite numbers ● Units of times ● Conversions for units of time ● Multiplicative comparisons using equations and number stories ● Properties of triangles ● Properties of quadrilaterals ● Explore line symmetry ● "What's My Rule?" patterns	**Students will be able to…** ● Recognize multiplicative comparison situations ● Identify a number story as additive or multiplicative and explain how they know ● Identify more than one factor pair for composite numbers less than 40 ● Write multiples of a 1-digit whole number ● Identify prime and composite numbers less than 40 ● Use U.S traditional addition and subtraction algorithms to solve 4-digit + 4-digit and 4-digit - 4-digit problems ● Use fact extensions to multiply by a multiple of 10 ● Identify properties of line segments and angles within quadrilaterals and identify right angles within triangles ● Identify one line of symmetry in 2-dimensional symmetric figures

Stage 2: Acceptable Evidence

Assessments	
Formative Assessments: ● Assessment Check-In ● Mental Math and Fluency ● Exit Slips/Slate Assessments ● Informal Observations ● Math Journal ● Home Links ● EDM Games ● Self-Assessment ● Questioning	**Summative Assessments:** ● Beginning of the Year Assessment ● Unit Progress Check ● Open Response ● Quizzes ● Tests ● Student Work Products

Stage 3: Learning Experiences

Lesson 2-1 Square Number Patterns

Standards: 4.OA.5, 4.NBT.5

Warm Up / Mental Math and Fluency: Practice multiplication facts and extended facts

Focus:

- **Math Message:** Make rectangular arrays with counters
- **Finding Arrays:** Share rectangular arrays, review square numbers, and look for patterns in square arrays
- **Finding Other Square Numbers:** Find square numbers through 100 and look for patterns

Practice:

- **Games - Subtraction Target Practice:** Practice place-value and subtraction skills
- **Math Boxes 2-1:** MJ1 page 36
- **Home Link 2-1:** Explore patterns in square numbers and record equations for arrays

Assessment: MJ1 page 35; Observe students working on page 35. Expect them to use multiplication to generate a square number pattern in Problems 1 and 2.

Differentiation Options:

- **Readiness:** To explore factoring numbers using a concrete model, students build arrays and find the total number of centimeter cubes for each array
- **Enrichment:** To extend work with arrays and patterns, students explore patterns in square arrays when the factors are changed by 1.Students cut out square arrays from grid paper and change the arrays into the new rectangle.
- **Extra Practice**: For practice identifying and continuing patterns, students work with triangular numbers. Given the first four triangular numbers, 1, 3, 6, and 10, students identify patterns and use them to find the next three triangular numbers.
- **Activity Cards:** 16-17
- **ELL Support:** Use everyday objects like egg cartons to illustrate rectangular arrays and practice using the terms *row, column,* and *number of objects in rows and columns* in a real-world context. Accept nonverbal and one-word responses, and allow students to use number cards, if necessary.

Lesson 2-2 The Area Formula for Rectangles

Standards: 4.NBT.4, 4.NBT.5, 4.MD.3

Warm Up / Mental Math and Fluency: practice multiplication facts and extended facts

Focus:

- **Math Message:** Find the area and perimeter of a rectangle
- **Finding Area and Perimeter:** Connect multiplication equations to finding the number of square units in a rectangle
- **Connecting to the Area Formula**: Develop a formula for the area of a rectangle.
- **Game - Rugs and Fences:** Practice finding the perimeters and areas of rectangles

Practice:

- **Game - Spin-and-Round:** Practice rounding large numbers
- **Math Boxes** 2-2: MJ1 page 38
- Home Link 2-2: Find the areas of rectangles

Assessment: Rugs and Fences; Expect most students to have an appropriate strategy for finding the area of rectangles while playing Rugs and Fences.

Differentiation Options:

- **Readiness:** For experience finding the area of a rectangle using a concrete model, students build rectangles with square pattern blocks. Encourage students to discuss patterns as they fill in the table
- **Enrichment:** To apply their understanding of perimeter and area to irregular figures, students work with partners to divide rectangles and compare the relationship between perimeter and area
- **Extra Practice**: For practice understanding the concept of area and using the area formula, students make as many different rectangles as they can with an area of 36 square units.
- **Activity Cards:** 18
- **ELL Support:** Explain that *area* is the amount of space, or surface, inside a closed boundary. Draw and display a shape on a square centimeter grid. Use gestures to show that the shape covers the whole area. Model finding the area by counting the number of squares the shape covers. Write numbers in each square unit as you count. Draw other rectangles on the grid and ask students to show the area using gestures and/or words.

Lesson 2-3 Factors and Factor Pairs

Standards: 4.OA.4, 4.NBT.5, 4.NBT.6

Warm Up / Mental Math and Fluency: Practice multiplication facts and extended facts

Focus:

- **Math Message:** Create arrays and write equations
- **Reviewing Factors and Products**: Review the meaning of factors and products and find factor pairs
- **Finding Factor Pairs**: Use equations and knowledge of multiplication and division to find factor pairs for given numbers
- **Game - Factor Captor:** Apply strategies for finding factors of numbers

Practice:

- **Game - Fishing for Digits:** Identify and express the values of digits in whole numbers
- **Math Boxes** 2-3: MJ1 page 40
- **Home Link** 2-3: Record equations and factor pairs

Assessment: Factor Captor; Observe students playing Factor Captor. Expect most to correctly find at least two factors for the 2-digit number.

Differentiation Options:

- **Readiness:** For experience using concrete representations to find factor pairs, students build arrays with centimeter cubes.
- **Enrichment:** To extend the concept of factors to larger numbers, students use the 1–110 Grid to play *Factor Captor.*
- **Extra Practice:** For practice identifying factors and products, students play *Factor Bingo.*
- **ELL Support:** Prior to the lesson, practice the terms *factor* and *product* by displaying a multiplication problem. Write $2 * 3$ and say: *Multiply 2 times 3*. Point to the numbers one at a time and say: *2 is a factor and 3 is a factor*. Then write the answer, 6, and say: *6 is the product of 2 times 3*. Repeat with other simple multiplication problems. Provide practice identifying the factors and the product by using prompts

Lesson 2-4 Multiples

Standards: 4.OA.4, 4.OA.5, 4.NBT.5, 4.NBT.6

Warm Up / Mental Math and Fluency: Practice multiplication facts and extended facts

Focus:

- **Math Message:** Solve a number story involving multiples
- **Finding Multiples**: List multiples of whole numbers
- **Exploring Factors and Multiples:** Explore the relationship between factors and multiples
- **Game - Buzz and Bizz-Buzz:** Practice naming multiples

Practice:

- **Identifying Place Value in Whole Numbers:** Review place value through the hundred-thousands
- Games: Multiples Bingo
- **Math Boxes** 2-4: MJ1 page 43
- **Home Link** 2-4: Practice finding multiples

Assessment: MJ1 page 41; This is the first exposure to the term multiple and to identifying multiples of numbers other than 10. Expect students to be able to find the multiples in Problems 1–4

Differentiation Options:

- **Readiness:** For experience using concrete representations to find factor pairs, students revisit the Readiness activity from Lesson 2-3.
- **Enrichment:** To extend their work with factors and multiples, students solve real-world number stories in which they must determine all factors of a number or a common multiple of two factors.
- **Extra Practice**: To practice identifying multiples, students play a variation of the game *Bingo!* with multiples. After writing specified numbers on a blank bingo card, students turn over number cards and look for a space on their bingo card showing a multiple of the number on the number card.
- **Activity Cards:** 19
- **ELL Support:** Students may confuse the terms *multiply* and *multiple*. Use teacher modeling to help them understand that the term *multiply* is a verb referring to an action, while *multiple* is a noun referring to a number. As you write $2 * 3$ on the board, say: *I multiply 2 by 3. The product is 6. 6 is a multiple of 2 and 3.* Repeat with a few more problems. Then use show-me requests for additional problems

Lesson 2-5 Prime and Composite Numbers

Standards: 4.OA.4, 4.NBT.5, 4.NBT.6

Warm Up / Mental Math and Fluency: Practice multiplication facts and extended facts

Focus:

- **Math Message:** List factor pairs for numbers
- **Defining Prime and Composite Numbers:** Learn definitions of prime and composite numbers
- **Classifying Prime and Composite Numbers**: Classify prime and composite numbers and list factors
- **Developing a Strategy for Factor Captor**: Use knowledge of number relationships to strategize the best moves for a high score.

Practice:

- **Game - Factor Bingo**: Identify factors of numbers to score a bingo
- **Math Boxes** 2-5: MJ1 page 46
- **Home Link** 2-5: List factors and identify prime and composite numbers

Assessment: Expect most students to be able to identify many, but not all, factors of a number in the 1–39 range.

Differentiation Options:

- **Readiness:** For experience constructing rectangular arrays, students use centimeter cubes to build as many arrays as they can for the numbers 18 and 24.
- **Enrichment:** To further investigate prime numbers, students explore Goldbach's Conjecture.
- **Extra Practice:** To gain additional practice classifying numbers as prime or composite, students work with the Sieve of Eratosthenes, an ancient algorithm for finding all prime numbers up to any given limit. Students mark all the multiples of each prime number and find that all numbers left unmarked are the prime numbers less than 100.
- **Activity Cards:** 20-21
- **ELL Support:** To reinforce the concept of factor pairs, display the number 8 and show the *factors* of 8 (1, 2, 4, 8), using gestures as you talk. Now show the *factor pairs* for 8 (2 and 4; 1 and 8), emphasizing that a factor pair for 8 is any two whole numbers that have a *product* of 8 when multiplied together. Have students find the factors and factor pairs for 10 and 12. Use gestures along with words as you display the written numbers to help students connect the words with the pairs of numbers.

Lesson 2-6 (2 day lesson) Little and Big

Standards: 4.OA.1, 4.OA.2, 4.OA.5

Warm Up / Mental Math and Fluency: Identify the place value of digits in a given number

Focus:

- **Math Message:** Decide whether suggested rules for a "What's My Rule?" table are correct and make arguments supporting their decisions
- **Making Conjectures and Arguments**: Use the terms conjecture and argument in a discussion of the "What's My Rule?" table
- **Solving the Open Response Problem**: Based on information in the problem, students make predictions, or conjectures, about the comparative heights of two dogs, and then make arguments to justify their answers

Focus:

- **Setting Expectations:** Review the open response problem and discuss what a good argument might include. They also review how to discuss others' work respectfully.
- **Reengaging in the Problem:** Analyze others' predictions and arguments and think about how multiplication can be used to solve the problem
- **Revising Work:** Revise their predictions and arguments based on what they learned in the reengagement discussion

Practice:

- **Math Boxes** 2-6: MJ1 page 78
- **Home Link** 2-6: Solve number stories involving multiplication

Assessment: Open Response; Collect and review students' revised work. Expect them to improve their arguments based on the class discussion.

Differentiation Options:

- **Adjusting the Activity:** Have students who made satisfactory arguments complete an additional problem
- **ELL Support:** Prior to lesson preview the Math Message by doing some "What's My Rule?" problems involving simple relationships. Use pictures and demonstrations to preview vocabulary

Lesson 2-7 Units of Time

Standards: 4.NBT.4, 4.NBT.5, 4.MD.1, 4.MD.2

Warm Up / Mental Math and Fluency: Identify the values of digits

Focus:

- **Math Message**: Convert larger units of time to smaller units of time
- **Converting Hours, Minutes, and Seconds**: Use a measurement scale to discuss the relationships between hours, minutes, and seconds
- **Solving Time Number Stories:** Solve number stories involving units of time

Practice:

- **Drawing Lines, Line Segments, Rays, and Angles:** Practice drawing and labeling points, lines, line segments, rays, and angles
- **Math Boxes** 2-7: MJ1 page52
- **Home Link** 2-7: Use measurement scales to fill in tables and solve number stories converting hours, minutes, and seconds

Assessment: MJ1 page 49; Observe while students solve Problems 1–4. Expect them to be able to convert hours to minutes and minutes to seconds when given the relationships 1 hour = 60 minutes and 1 minute = 60 seconds. Expect that some will be able to explain that they multiplied the number of hours by 60 to find the number of minutes and multiplied the number of minutes by 60 to find the number of seconds.

Differentiation Options:

- **Readiness:** For experience with units of time, students gauge the length of a second, a minute, and an hour. Tell students to put their heads down, close their eyes, and stay that way until they think a minute has passed. After saying *Start,* record each passing second with a tally mark. When students think a minute has passed, they open their eyes and count the tallies marking the elapsed seconds. Ask them to remember their individual totals. When a full minute has passed, say *Stop*. Then discuss what a minute feels like. Use the activity to begin a discussion of units of time and the kinds of actions or tasks that can be accomplished in each unit.
- **Enrichment:** To extend work with units of time, students write and solve time number stories and then trade with a partner.
- **Extra Practice:** To provide practice converting measures of time to other units, use the template on MM pg. TA9 to create additional conversion problems for your students. For a challenge, consider creating problems that convert smaller units to larger units.
- **Activity Cards**: 22
- **ELL Support:** Use a demonstration clock with a second hand to help students learn the meanings of *seconds, minutes,* and *hours.* Point to the second hand and then move your hand quickly around the clock, saying *seconds*. Move it more slowly and say *minutes.* Then move it very slowly as you say *hours*. Have students imitate the gestures, saying the appropriate words. As students work on the activities, focus discussion on how their experience of time connects to the words *seconds, minutes,* and *hours.*

Lesson 2-8 Multiplicative Comparisons

Standards: 4.OA.1, 4.OA.2, 4.NBT.5

Warm Up / Mental Math and Fluency: Identify the values of digits

Focus:

- **Math Message:** Compare two lengths and write statements
- **Sharing Comparison Statements:** Explore the language and features of multiplicative comparison situations
- **Representing Comparison Statements as Equations:** Describe relationships between quantities and represent them with equations
- **Creating and Interpreting Statements and Equations:** Create and interpret multiplicative comparison statements and equations

Practice:

- **Games - Factor Captor**: Find factors of larger numbers
- **Math Boxes** 2-8: MJ1 page 54
- **Home Link** 2-8: Create and interpret multiplicative comparison statements and equations

Assessment: This lesson introduces students to multiplicative comparison situations involving verbal statements and equations. At this stage, expect students to solve Problems 1 and 2, which involve multiplication facts outside the context of number stories.

Differentiation Options:

- Readiness: For practice with the "harder" multiplication facts, students cut out and practice with the Fact Triangles on MM, page TA16.
- **Enrichment:** To extend work with multiplicative comparisons in real-life contexts, students write multiplication equations representing comparisons based on information about mother and baby animal weights.
- **Extra Practice**: For additional practice with multiplicative comparison statements, students write a multiplicative comparison number story and write equations representing multiplicative comparisons on MM, page 73.
- **ELL Support:** Prior to the lesson, use Total Physical Response activities with short questions to review the comparison words and phrases that will be used in the lesson.

Lesson 2-9 Multiplicative Comparisons Number Stories

Standards: 4.OA.1, 4.OA.2, 4.NBT.4, 4.NBT.5

Warm Up / Mental Math and Fluency: Practice multiplication facts and extended facts

Focus:

- **Math Message:** Compare additive and multiplicative situations
- **Reviewing Multiplicative Comparisons:** Review the meaning of multiplicative comparisons
- **Solving Multiplicative Comparison Problems:** Use models to solve comparison number stories
- **Game - How Much More?** Solve comparison number stories and write equations representing the comparisons

Practice:

- **Game - Buzz and Bizz-Buzz**: Practice naming multiples
- **Math Boxes** 2-9: MJ1 page 56
- **Home Link** 2-9: Represent multiplicative comparison situations using words, diagrams or drawings, and equations

Assessment: Observe students playing How Much More? Expect them to be able to determine whether number stories invoke additive or multiplicative comparisons and to record appropriate addition and multiplication equations on their How Much More? Record Sheet.

Differentiation Options:

- **Readiness:** For experience recognizing and solving additive comparison number stories, students complete each diagram on MM, page 75 and then select a number sentence that matches each situation
- **Enrichment:** To further explore problems involving multiplicative comparisons, students create their own comparison cards for the game How Much More?
- **Extra Practice:** For more practice with multiplicative comparisons, students solve a series of number stories. Encourage them to make drawings or diagrams to help visualize the quantities being compared.
- **ELL Support:** To help students with multiplicative comparison statements, distribute a small collection of centimeter cubes. Display 1 cube and say: Show 3 times as many cubes. Point to a student's pile of 3 cubes. Say and write: "*3 is 3 times as many as 1*". Display 2 cubes and say: Show 4 times as many cubes. Repeat the follow-up discussion, encouraging students to repeat your statements.

Lesson 2-10 Classifying Triangles

Standards: 4.G.2

Warm Up / Mental Math and Fluency: Practice multiplication facts and extended facts

Focus:
- **Math Message:** List everything they know about triangles
- **Reviewing Properties of Triangles:** Discuss common properties of triangles
- **Classifying Triangles by Angle Properties:** Classify triangles by angles and discuss properties of right triangles

Practice:
- **Game - Rugs and Fences:** Use formulas to find the perimeter and area of rectangles
- **Math Boxes** 2-10: Preview for Unit 3 - MJ1 page 58, fraction circles
- **Home Link** 2-10: Match geometric figures and properties

Assessment: MJ1 page 57; Expect most students to be able to successfully identify the right angle in Problem 1 on journal page 57

Differentiation Options:
- **Readiness:** For experience identifying right angles, students use a small square corner of a sheet of paper to check whether angles are more, less, or equal to a right angle. Before students tear off the corner of the paper, have them put a check in the interior of the right angle, on both sides. Then they use the paper corner to compare various angles in the classroom to a right angle.
- **Enrichment:** To further explore the properties of triangles, students create categories of triangles and sort the Geometry Template triangles according to these categories. Partners then try to discover the sorting rules.
- **Extra Practice:** For practice identifying right triangles, students complete MM page 78, on which they sort the Geometry Template triangles.
- **Activity Cards:** 23
- **ELL Support:** Use Total Physical Response prompts and think-alouds to scaffold for the terms *side, angle, obtuse, acute, right, vertices,* and *vertex,* as you construct the figures being named. Have students make their own angles, encouraging them to repeat after you the attribute names. Accept nonverbal responses by having students point to the attributes.

Lesson 2-11 Classifying Quadrilaterals

Standards: 4.G.1, 4.G.2

Warm Up / Mental Math and Fluency: Write numbers in standard form

Focus:
- **Math Message:** Make four-sided polygons on geoboards
- **Sorting Quadrilaterals**: Sort quadrilaterals and justify their classifications
- **Discussing the Quadrilateral Sort**: Discuss properties used to sort
- **Game - Polygon Capture:** Identify polygons by their properties

Practice:
- **Game - Number Top-It:** Compare numbers through the hundred-thousands
- **Math Boxes** 2-11: MJ1 page 60
- **Home Link** 2-11: Work with properties of quadrilaterals

Assessment: Polygon Capture; Have students select one of the polygon cards and one of its properties on an Exit Slip

Differentiation Options:
- **Readiness:** To experience constructing parallel lines using a concrete model, students make line segments on a geoboard.
- **Enrichment:** To further explore the attributes of quadrilaterals, students solve the riddles on MM page 81. They name and draw their solutions.
- **Extra Practice**: Game - Geometry Concentration (Part 3) - For practice matching quadrilaterals with their names and definitions, students play *Geometry Concentration,* Practice.
- **Activity Cards:** 24
- **ELL Support:** Use Total Physical Response prompts and think-aloud statements to create and model the terms *parallel* and *perpendicular* with materials such as connecting straws. Have students make their own parallel and perpendicular lines and repeat the attribute names after you. Accept nonverbal responses by having students point to the attributes. Review the terms *side, angle, obtuse, acute, right angle, vertices,* and *vertex* in the same manner.

Lesson 2-12 Finding Line Symmetry

Standards: 4.G.3

Warm Up / Mental Math and Fluency: Write large numbers in standard form

Focus:

- **Math Message:** Identify a drawing as half of a 5-pointed star
- Introducing Line Symmetry: Discuss symmetry in the real world
- **Finding Lines of Symmetry:** Determine the number of lines of symmetry in pictures of objects
- **Exploring Lines of Symmetry:** Identify symmetry and determine the number of lines of symmetry in pictures and objects

Practice:

- **Game - How Much More?** Students try to earn the most points for creating valid multiplicative comparisons
- **Math Boxes** 2-12: MJ1 page 62
- **Home Link** 2-12: Find and draw lines of symmetry and identify symmetric figures

Assessment: As you observe, check to see that students are able to identify at least one line of symmetry in shapes.

Differentiation Options:

- **Readiness:** To explore symmetry using concrete materials, students use pattern blocks to create a half-image for a partner who will then create the other half.
- **Enrichment:** To explore identifying line symmetry, students complete a Venn diagram to identify capital letters of the alphabet that have horizontal and/or vertical line symmetry.
- **Extra Practice:** For practice with lines of symmetry, students choose eight shapes on their Geometry Template and find all possible lines of symmetry.
- **Activity Cards:** 25
- **ELL Support:** Display key vocabulary like *line of symmetry, symmetrical, fold, reflect, horizontal/vertical,* and *match/match up*. Use gestures to highlight the connections between the visual representations, the written words, the spoken words, and the actions students will be performing in the lesson (for example, folding, cutting, tracing, drawing, and matching). Ask students to repeat the words as you point to the written word or visual model.

Lesson 2-13 Finding the Pattern

Standards: 4.OA.5, 4.NBT.4, 4.NBT.5

Warm Up / Self-Assessment: Find multiples of numbers

Focus:

- **Math Message:** Complete a "What's My Rule?" table
- **Applying Rules:** Review how a function machine works
- **Reviewing Variations of the "What's My Rule?" Routine:** Review different types of "What's My Rule?" tables and identify patterns not stated in the rule
- **Exploring Shape Patterns:** Explore shape patterns

Practice:

- **Practicing Addition and Subtraction:** Use standard algorithms to add and subtract multi-digit whole numbers
- **Math Boxes** 2-13: MJ1 page 66
- **Home Link** 2-13: Generate and analyze shape and number patterns
- **Assessment Check In:** MJ1 page 63; Expect most students to be able to solve the "What's My Rule?" tables

Differentiation Options:

- **Readiness:** To provide experience expressing relationships between number pairs in "What's My Rule?" tables, students use pattern blocks to determine the connection between the number of squares and triangles and the number of sides they have.
- **Enrichment:** To extend their work analyzing number patterns, students explore diagonal sums on the number grid. They discover that the sums of each pair of whole numbers in the diagonal corners of any rectangle drawn on the number grid are equal and try to uncover the reason why this is true.
- **Extra Practice:** Literature Link For additional practice with patterning, students read *Two of Everything* by Lily Toy Hong, and then imagine doubling and redoubling the number of coins for 10 days. On the tenth day students estimate the total number of coins and then complete a "What's My Rule?" table to find the exact number. Remind students that the coins are doubled on the first day.
- **Activity Cards:** 26-27
- **ELL Support:** Scaffold to help students understand the terms in "What's My Rule?" tables. Display a chart of an enlarged "What's My Rule?" table, labeled with *Rule, in,* and *out*. Use hand gestures to demonstrate the procedure of putting something into a machine and getting something out based on a simple rule. Use the words *in/input* and *out/output* interchangeably. Have students point to the "What's My Rule?" table and repeat the phrases

Lesson 2-14 (2-day lesson) Unit 2 Progress Check

Standards: 4.G.1, 4.G.2, 4.G.3, 4.MD.1, 4.MD.2, 4.MD.4, 4.NBT.4, 4.NBT.5, 4.OA.2, 4.OA.4, 4.OA.5

Warm Up / Self-Assessment: Complete the Self-Assessment

Assessment:
- **Unit 2 Assessment:** These items reflect mastery expectations to this point
- **Unit 2 Challenge** (Optional): Students may demonstrate progress beyond expectations
- **Cumulative Assessment:** These items reflect mastery expectations to this point

Look Ahead:
- **Math Boxes** 2-14: Preview for Unit 3 - - MJ1 page 67, fraction circles
- **Home Link** 2-14: Students take home the Family Letter that introduces Unit 3

Differentiation Options: Adjusting the Assessment - See TE for adjustments to the assessment

Student Resources	
Print	Student Math Journal Volume 1 Student Reference Book
Print/Online	Activity Cards EM Games Online
	http://www.abcya.com http://www.coolmath-games.com/

Teacher Resources	
Print	Teacher's Lesson Guide Volume 1
Print/Online	• Spiral Tracker • Math Masters • Assessment Handbook
Literature Link	Two of Everything
Online	• eToolkit • ePresentations • http://www.internet4classrooms.com/common_core/fourth_4th_grade_math_mathematics.htm • https://www.ixl.com/math/grade-4 • https://www.brainpop.com/math/numbersandoperations/

	● https://www.youtube.com/channel/UCBuMwlP7kHkNxdPAqtFSJTw

Unit Plan Title	Fractions and Decimals
Suggested Time Frame	20 days including flex days

Stage 1: Desired Results

Overview / Rationale

In this unit, students explore fraction equivalence and compare and order fractions using different representations. They then extend their understanding of fractions to decimals, comparing and ordering decimals using the same methods for comparing fractions. Student learning will focus on three clusters of the NJ Student Learning Standards for Math (NJSLS-M), Number and Operations in Base Ten, Numbers and Operations with Fractions, Measurement and Data, and Geometry.

Standards

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.4 - Fluently add and subtract multi-digit whole numbers using the standard algorithm.

4.NF.1 - Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ 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 <, and justify the conclusions, e.g., by using a visual fraction model.

4.NF.6 - Use decimal notation for fractions with denominators 10 or 100.

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.1 - Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb., oz.; l, ml; hr., min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.

Technology Integration
__X__ **8.1 Educational Technology:** All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
- Student Websites - Teacher Websites - SMART board
____**8.2 Technology Integration, Engineering, Design and Computational Thinking – Programming** All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

INTEGRATED SOCIAL AND EMOTIONAL LEARNING COMPETENCIES
The following social and emotional competencies are integrated in this curriculum document:

Self-Awareness
_____Recognize one's own feelings and thoughts
_____Recognize the impact of one's feelings and thoughts on one's own behavior
_____Recognize one's personal traits, strengths and limitations
_____Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management
__x__Understand and practice strategies for managing one's own emotions, thoughts and behaviors
__x__Recognize the skills needed to establish and achieve personal and educational goals
__x__Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness
__x__Recognize and identify the thoughts, feelings, and perspectives of others
_____Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
_____Demonstrate an understanding of the need for mutual respect when viewpoints differ
_____Demonstrate an awareness of the expectations for social interactions in a variety of setting

Responsible Decision Making
__x__Develop, implement and model effective problem solving and critical thinking skills
_____Identify the consequences associated with one's action in order to make constructive choices
_____Evaluate personal, ethical, safety and civic impact of decisions

Relationship Skills
_____Establish and maintain healthy relationships
__x__Utilize positive communication and social skills to interact effectively with others
_____Identify ways to resist inappropriate social pressure
_____Demonstrate the ability to present and resolve interpersonal conflicts in constructive ways
_____Identify who, when, where, or how to seek help for oneself or others when needed

In this unit plan, the following 21st Century Life and Careers skills are addressed:				
Check ALL that apply – **21st Century Themes**			**Indicate whether these skills are:** ● **E – encouraged** ● **T – taught** ● **A – assessed** **Career Ready Practices**	
9.1	**Personal Financial Literacy**		E	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		TA	CRP2. Apply appropriate academic and technical skills.
	Money Management			CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management		ETA	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing			CRP5. Consider the environmental, social and economic impacts of decisions.
X	Becoming a Critical Consumer			CRP6. Demonstrate creativity and innovation.
X	Civic Financial Responsibility			CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		ETA	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	**Career Awareness, Exploration, and Preparation**			CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		E	CRP11. Use technology to enhance productivity.
	Career Preparation			CRP12. Work productively in teams while using cultural global competence.

Interdisciplinary Connections

Other standards covered:

RI.4.3 - Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

RI.4.4 - Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a *grade 4 topic or subject area*.

RI.4.7 - 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.

SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly

Essential Questions:	Enduring Understandings:
● Why do we use fractions and decimals? ● How are fractions and decimals used in the real world? ● What is the Metric System and how is it different than U.S Customary Units?	***Students will understand that…*** ● Represent decimals and fractions ● Solve number stories involving fractions. ● Convert measurements using the Metric units.
Knowledge:	**Skills:**
Students will know… ● Fraction equivalents ● How to use a model to recognize fractions ● How to generate equivalent fractions using a model ● Use length or a number line model to recognize fractions ● Use length or a number line to generate equivalent fractions ● A rule of equivalent fractions ● To compare fractions with different numerators and denominators ● Comparing fractions in number stories ● Strategies for ordering fractions ● How to place fractions on a number line ● Relationships between fractions and decimals ● How to use base-10 blocks to model decimals ● How to read and write decimals to the hundredths ● Decimals in the context of measurement ● Conversions from centimeters to millimeters ● Decimal comparisons	**Students will be able to…** ● Read and identify numbers through the hundred thousands ● Read numbers in standard and expanded for through the millions ● Write numbers in expanded form through the thousands ● Compare and order numbers through millions to the thousands place or larger ● Record comparisons using >, < or = ● Use U.S. traditional addition and subtractions algorithms for 4-digit + 4-digit and 4-digit - 4 digit problems ● Recognize two equivalent fractions through 12th using a model ● Compare two fractions using a model ● Use a preferred model to represent decimal to hundredths ● Name decimals using base-10 numerals ● Translate between decimal notation and fractions with denominators of 10 or 100 ● Compare decimals using a model ● Convert between meters, centimeters and millimeters in a 2-column table

Stage 2: Acceptable Evidence

Assessments	
Formative Assessments: ● Assessment Check-In ● Mental Math and Fluency ● Exit Slips/Slate Assessments ● Informal Observations ● Math Journal ● Home Links ● EDM Games ● Self-Assessment ● Questioning	**Summative Assessments:** ● Beginning of the Year Assessment ● Unit Progress Check ● Open Response ● Quizzes ● Tests ● Student Work Products

Stage 3: Learning Experiences

Lesson 3-1 Equal Sharing and Equivalence

Standards: 4.NF.1, 4.NF.2, 4.MD.2

Warm Up /Mental Math and Fluency: Read number names for large numbers

Focus:

- **Math Message:** Solve an equal-sharing problem
- **Exploring Equivalent Fractions through Equal Sharing:** Model equal-sharing situations and examine equivalent names for those models
- **Solving Equal-Sharing Problems**: Solve number stories in a variety of ways resulting in equivalent fraction situations

Practice:

- **Math Boxes** 3-1: MJ1 page 70
- **Home Link** 3-1: Solve equal-sharing number stories and generate equivalent-fraction answers

Assessment: MJ1 pages 68-69; Expect most students to recognize that on journal pages 68–69 they must subdivide shared quantities into equal fractional pieces in at least one way. Some may not be able to identify the fractional pieces into which leftovers must be subdivided in more than one way.

Differentiation Options:

- **Readiness:** Literature Link To provide exposure to basic fractions, read pages 3–9 of *Give Me Half!* by Stuart Murphy to a small group of students.
- **Enrichment:** To apply their understanding of equivalent fractions, students solve a proportional reasoning problem and show their work
- **Extra Practice**: For additional practice with equivalent fractions, students use drawings to solve each problem on MM page 98 in more than one way.
- **ELL Support:** Scaffold using the terms one-half, two-halves, one-third, three-thirds, etc., up to twelve-twelfths. Gather pictures of familiar examples of each term and caption them accordingly, such as one-half of an apple or four-fourths of a divided windowpane. Distribute pictures and use Total Physical Response prompts along with simple questions. Encourage students to repeat short sentences.

Lesson 3-2 Fraction Circles and Equivalence

Standards: 4.OA.4, 4.OA.5, 4.NF.1

Warm Up /Mental Math and Fluency: Practice rounding

Focus:

- **Math Message:** Use fractions circle pieces to model fractions equivalent to 1
- **Exploring Equivalent Fractions:** Share different want to model fractions equivalent to twelve (12)
- **Starting a Collection of Fraction Names**: Model and record names for fractions equivalent to thirteen (13)
- **Continuing a Collection of Fraction Names**: Model and record names for equivalent fractions and look for number patterns in equivalent fraction pairs

Practice:

- **Math Boxes** 3-2: MJ1 pg. 72
- **Home Link** 3-2: Represent fractions equivalent to ¼ and describe patterns

Assessment: Expect most students to be able to use fraction circle pieces to find all equivalencies for ¼ from eighths through twelfths.

Differentiation Options:

- **Readiness:** To explore relationships among fraction circles prior to developing formal language for describing them, students complete MM page 103.
- **Enrichment:** To further explore equivalent fractions, students use a clock face to model equivalent fractions with denominators that are factors of 60.
- **Extra Practice:** Students play *Fraction Match* to practice identifying equivalent fractions.
- **ELL Support:** Use word cards, drawings, number models, and fraction circles to preview fraction-related vocabulary, including *top, bottom, denominator, numerator,* and *unit.* Use directions or questions like these: *Show me the top number in the fraction. Point to the denominator in this fraction. Make one-half using the fraction circles. How many dark green pieces fill the whole red circle?* Use gestures to emphasize connections between the different representations.

Lesson 3-3 Number Lines and Equivalence

Standards: 4.NF.1, 4.NF.2

Warm Up /Mental Math and Fluency: Read number names for large numbers

Focus:

- **Math Message:** Label number lines with fractions and mixed numbers
- **Using Number Lines:**
  - Use number lines to explore the relationship between fifths and tenths
  - Folding Number Lines for Thirds, Sixths, and Twelfths: Use number lines to explore the relationship between thirds, sixths, and twelfths
  - Solving Equivalence Problems with Number Lines: Use number lines to determine whether various fractions are equivalent

Practice:

- **Game - Buzz and Bizz-Buzz:** Practice naming multiples
- **Math Boxes** 3-3: MJ1 page 76
- **Home Link** 3-3: Students use number lines to work with equivalent fractions

Assessment: Circulate as students find pairs of equivalent fractions. Expect most students to be able to use number lines to accurately identify equivalent fractions for fifths.

Differentiation Options:

- **Readiness:** For experience recognizing the names of equivalent fractions, students find equivalent fractions by matching fractional parts of circles.
- **Enrichment:** To further explore fraction equivalency, students create equal parts by folding paper. They write fractions and equivalent fractions based on the number of parts.
- **Extra Practice:** To reinforce their understanding of equivalent fractions, students determine equivalence by comparing number lines.
- **Activity Cards:** 28
- **ELL Support:** Introduce students to the terms *fold, dash, dashed,* and *cut*. Give students a piece of paper with a dashed line, making sure the dashes are big enough to be clearly distinguished. Point to one dash and say: *This is a dash*. Ask students to point to dashes on the line. Then trace your finger along the length of the line, saying: *This is a dashed line*. Have students repeat the gesture. Use a think-aloud as you demonstrate folding the paper along the dashed line and cutting it. Ask students to fold their paper and then cut it.

Lesson 3-4 An Equivalent Fractions Rule

Standards: 4.OA.4, 4.OA.5, 4.NF.1

Warm Up /Mental Math and Fluency: List multiples of given numbers

Focus:

- **Math Message:** Color fraction circles and find missing numerators
- **Developing a Rule for Finding Equivalent Fractions:** Look for number patterns in and learn a rule for generating equivalent fractions
- **Applying the Equivalent Fractions Rule:** Generate equivalent fractions with the denominators of 10 and 100
- **Generating Equivalent Fractions:** Apply and analyze the Equivalent Fractions Rule to generate equivalent fractions

Practice:

- **Solve Multistep Number Stories:** Use the four operations to solve number stories
- **Math Boxes** 3-4: MJ1 page 80
- **Home Link** 3-4: Apply the Equivalent Fractions Rule

Assessment: MJ1 page 78; As students complete their work, circulate and observe. Since this is their first exposure to the Equivalent Fractions Rule, do not expect that students will use the rule accurately.

Differentiation Options:

- **Readiness:** To explore fractional parts of a whole, students divide circles into equal parts and color specified parts of the whole. Discuss how equivalent fractions can be used to solve the problems.
- **Enrichment:** To further explore strategies for finding equivalent fractions, students complete a matching activity.
- **Extra Practice:** To practice generating equivalent names for fractions, students complete name collection boxes. Encourage students to complete the boxes with equivalent fractions and mixed numbers with denominators 2, 3, 4, 6, 8, 10, 12, and 100. Create problems to meet the needs of individual students, or have them create and solve their own problems using the Equivalent Fractions Rule.
- **ELL Support:** Continue emphasizing the term *equivalent* by showing students 10 longs and 1 flat.

Lesson 3-5 (2-day lesson) Veggie Pizzas

Standards: 4.NF.2

Warm Up /Mental Math and Fluency: Compare numbers using <, >, or =

Focus:

- **Math Message:** Use benchmarks to match visual representations of fractions with fraction symbols
- **Matching Fraction Representations with Symbols:** Discuss how they used benchmarks and mathematical reasoning to match visual representations of fractions with symbolic representations
- **Solving the Open Response Problem:** Use mathematical models (for example, drawings and fraction circle pieces) to determine and compare the amount of pizza each student in four different groups receives on a field trip
- **Setting Expectations:** Discuss what constitutes a complete answer to the open response problem and what it means to use mathematical models to solve problems and explain their solutions
- **Reengaging in the Problem:** Analyze others' work and discuss different strategies and justifications
- **Revising Work:** Revise their answers and models based on the class discussion

Practice:

- **Math Boxes** 3-5: MJ1 page 82
- **Home Link** 3-5: Make sense of another student's drawing used to solve a fraction problem

Assessment: Open Response; Collect and review student's revised work. Except students to improve their drawings and explanations based on the class discussion. For the content standard, except most students to correctly decide that ⅞ pizza (the share of students in the wild Meadow group) is the largest share of pizza problem 1.

Differentiation Options:

- **Adjusting the Activity:** For students who have difficulty, ask them to determine the amount of pizza each student would get in two of the groups—the Forest Preserve group and the Farmer's Cornfield group. If they succeed with those two groups, have them go back to the full problem, involving all four groups.
- **ELL Support:** English language learners may have difficulty explaining their matches in the Math Message. Encourage them to use models to help illustrate their reasoning to a partner and to use gestures, such as pointing, as part of their explanations. Prior to the lesson, use role-play activities to introduce students to the context of the open response problem, including the ideas and vocabulary for field trips, dividing pizzas, and the different locations listed.

Lesson 3-6 Comparing Fractions

Standards: 4.NF.1, 4.NF.2

Warm Up /Mental Math and Fluency: Find multiples of numbers

Focus:

- **Math Message:** Compare two fractions
- **Exploring Fraction Comparisons**: Review multiple ways to compare fractions
- **Comparing Fractions in Number Stories:** Learn strategies to solve number stories that involve comparing fractions
- **Solving Comparison Number Stories:** Solve number stories that involve comparing fractions

Practice:

- **Practicing Place-Value Concepts**: Practice place-value concepts by reviewing the values of digits in numbers and their relationships
- **Math Boxes** 3-6: MJ1 page 85
- **Home Link** 3-6: Students compare fractions to solve number stories

Assessment: MJ1 page 83; Expect most students to correctly use a visual model to compare fractions, but encourage students to use alternative strategies modeled in the lesson.

Differentiation Options:

- **Readiness:** To explore comparing fractions with the same numerator or denominator, students use < and > symbols to identify fraction relationships. Then they solve a number story about different-size slices of birthday cake and compare the fractional sizes of the slices.
- **Enrichment:** To explore fraction-comparison number stories, students write their own problems. They exchange problems with partners, solve using more than one strategy, and then discuss and justify their solutions.
- **Extra Practice:** For experience solving and explaining solutions to fraction-comparison number stories, partners solve problems on MM pg. 119. Encourage students to use fraction circles and number lines to help them visualize the fractions.
- **Activity Cards:** 29
- **ELL Support:** Pre-teach the vocabulary of comparing quantities. Show students the number 5 displayed in a ten frame and the number 7 in a second ten frame. Say: *I am going to compare these two numbers. 5 is less than, or smaller than, 7.* Use gestures to show that 5 is smaller. Put a < symbol between the two ten frames. Also include some

simple fractions, such as *halves, fourths,* and *thirds.* Emphasize key vocabulary used regularly in the lesson: *greater/smaller than; more/less than.*

Lesson 3-7 Comparing and Ordering Fractions

Standards: 4.NF.2

Warm Up /Mental Math and Fluency: Compare multi-digit numbers using < or > symbols

Focus:

- **Math Message:** Compare two fractions
- **Reviewing Fraction Comparison**: Share strategies for solving a fraction-comparison problem
- **Ordering Fractions:** Use various strategies to order fractions
- **Justifying the Order of Fractions**: Place fractions on number lines

Practice:

- **Games – Spin and Round**: Practice rounding numbers through the hundred-thousands
- **Math Boxes** 3-7: MJ1 page 88, fraction circles
- **Home Link** 3-7: Order fractions and place them on number lines

Assessment: MJ1 page 87; Observe students using a model to compare each fraction to the benchmark fraction ½. Expect most students to be able to correctly place the fractions in relationship to ½. For students who struggle, have them determine the fraction that is equivalent to ½ and has the same denominator as the fraction they are trying to place on their number line. This will allow them to focus on the numerators. Do not expect students to correctly order all the fractions in problems 3-5.

Differentiation Options:

- **Readiness:** To explore comparing fractions, students sort fractions represented both as area and as number-line models into groups according to their relative sizes.
- **Enrichment:** To create fractions compared to a given benchmark, students build specific fractions using only two digits. Have partners discuss how they interpreted the instructions and chose the digits to form each fraction.
- **Extra Practice:** To practice comparing and ordering fractions, students play *Fraction Top-It* with fraction cards cut from Activity Sheets in the back of MJ1. Have students describe why their fraction is the largest.
- Activity Cards: 30
- **ELL Support:** To help students understand comparison terms used in this lesson, provide vocabulary cards picturing a small object and a large object to illustrate the terms *smaller* and *larger*. Ask students to point to the smaller one.

Lesson 3-8 Modeling Tenths with Fraction Circles

Standards: 4.NF.1, 4.NF.3, 4.NF.3b, 4.NF.6, 4.NF.7, 4.MD.2

Warm Up /Mental Math and Fluency: : Express number written in expanded form to standard form

Focus:

- **Math Message**: Solve number story involving fractions
- **Exploring Tenths with Fraction Circles**: Experiments with fraction circles
- **Comparing Tenths:** Compare decimals
- **Using Decimal Notation for Tenths and Comparing Tenths**: Compare decimals and fractions in tenths

Practice:

- **Game - Rugs and Fences:** Find perimeters and areas of rectangles
- **Math Boxes** 3-8: MJ1 page 90
- **Home Link** 3-8: Translate between decimal and fraction notation for tenths

Assessment: MJ1 page 89; Expect that students should able to use a model to change from fractions with 10 in the denominator to decimals for Problems 1 and 2.

Differentiation Options:

- **Readiness:** To explore multiple ways fractions can be represented and to build a foundation for decimal work, students use paper, fraction circles, and number lines to represent a fraction.
- **Enrichment:** To explore hundredths using a concrete model, students construct a Fraction/ Decimal Wheel with 2 different-color circles.
- **Extra Practice:** To recognize the use of decimals in everyday life, students search for decimal notations in magazines, newspapers, and other print sources.
- **Activity Cards:** 31-32
- **ELL Support:** Preview concepts and vocabulary from the lesson by working with fraction circles, using Total Physical Response commands.

Lesson 3-9 Modeling Decimals with Base-10 Blocks

Standards: 4.NF.6

Warm Up /Mental Math and Fluency: Round numbers

Focus:

- **Math Message:** Write dollar and cents amounts
- **Exploring Tenths with Base-10 Blocks:** Discuss fractional parts of a dollar and explore tenths using base-10 blocks and a square grid
- **Exploring Hundredths Using Base-10 Blocks:** Represent hundredths with base-10 blocks
- **Using Decimal Notation for Fractions:** Write fractions and decimals for shaded parts of square grids, and shade grids to represent decimals

Practice:

- **Game - Fraction Match:** Practice identifying equivalent fractions
- **Math Boxes** 3-9: MJ1 page 92
- **Home Link** 3-9: Students represent decimals and fractions

Assessment: MJ1 page 91 Expect that most students will accurately represent decimals to the tenths in Problem 4. Many will be able to represent decimals to the hundredths in other problems.

Differentiation Options:

- **Readiness**: To explore decimals to the hundredths place using a concrete model, students make bill and coin combinations for given amounts.
- **Enrichment:** To explore the concept of the whole using a concrete model, students find wholes based on different tenths and hundredths. They identify the value of base-10 blocks when different combinations are designated as the whole and determine the whole given a fractional part.
- **Extra Practice:** To explore hundredths of a dollar, students turn coin amounts into pennies, shade in a hundredths grid and write both the fraction and decimal notations.
- **ELL Support**: Continue providing experience with the term *one-tenth* and add the term *one-hundredth.* Review the pictures used in Lesson 3-1 and combine with pictures of familiar examples of one-hundredth, captioned accordingly. Examples might include a penny, a cube, and a number grid. Distribute the pictures and use Total Physical Response prompts along with commands and questions that do not require extended answers.

Lesson 3-10 Tenths and Hundredths

Standards: 4.NF.5, 4.NF.6, 4.NF.7

Warm Up /Mental Math and Fluency: Compare numbers using < or >

Focus:

- **Math Message:** Name decimals using numerals
- **Representing Decimals:** Use base-10 blocks to show decimal representations
- **Exploring Place Value for Tenths and Hundredths**: Name and record decimals and fractions using words and numerals
- **Solving Place-Value Problems:** Shade grids and name decimal amounts using words and numerals

Practice:

- **Games - Polygon Capture:** Identify polygons by their properties
- **Math Boxes** 3-10: Preview for Unit 4 - MJ1 page 94
- **Home Link** 3-10: Write decimals for partially shaded 10 by 10 grids, write numerals for decimals expressed in words, and complete sequences of decimals

Assessment: MJ1 page 93; Observe students completing journal page. Expect that most will be able to represent the amount covered on the grids as a fraction and as a decimal.

Differentiation Options:

- **Readiness:** To explore the relationships among hundredths, tenths, and ones using a concrete model, students play *Base-10 Decimal Exchange.*
- **Enrichment:** To explore place value to the thousandths, students solve place-value puzzles using mathematical clues.
- **Extra Practice:** To practice using a tool to demonstrate decimal place value, students create a Decimal Place-Value Flip Book to complete the activities on Activity Card 34.
- **Activity Cards:** 33-34
- **ELL Support**: Prior to the lesson, prepare a set of index cards showing the name together with the corresponding numeral for each of the following: 4, 14, 40, 100, 0.01, 400, and 0.04. Show the cards one by one, pointing to the numeral or using other gestures as you say the number to highlight the connection between the spoken and written words. Then say the name and ask students to point to the correct numeral. Repeat as needed with other numbers, such as 3, 13, 30, 300, and 0.03.

Lesson 3-11 Tenths and Hundredths of a Meter

Standards: 4.NF.6, 4.NF.7, 4.MD.1

Warm Up /Mental Math and Fluency: Identify factor pairs

Focus:

- **Math Message:** Estimate the length of a meter
- **Exploring Decimals in the Metric Units:** Use a meter stick to explore decimals
- **Using Decimals for Measurement Equivalents:** Change measure in centimeters to meters
- **Writing Metric Measurements in Decimal Notation**: Write measurements using decimal notation and make connections between various representations

Practice:

- **Game - Fraction Top-It:** Practice comparing fractions
- **Math Boxes** 3-11: MJ1 page 97
- **Home Link** 3-11: Fill in missing decimal numbers on number lines and mark metric measures on a ruler

Assessment: MJ1 page 95; Observe students completing journal page 95. Expect most to be able to correctly represent decimals to the hundredths using longs and cubes.

Differentiation Options:

- **Readiness:** To review measuring length in metric units, students choose objects or distances in the classroom that they think are approximately 1 meter in length. They then estimate the length in centimeters and use a meter stick to measure it.
- **Enrichment:** To explore metric equivalencies of length involving decimals, students convert measures into larger and smaller units.
- **Extra Practice:** To practice measuring in centimeters and converting to meters, students complete MM page 134.
- **Activity Cards:** 35-36
- **ELL Support:** Prior to the lesson, review the measurement vocabulary used in this lesson. Display either a real or projected meter stick, using gestures to highlight how it is made up of 100 centimeters. Ask questions like these: *Where is _____cm on the meter stick? Show me _____cm. If time permits, students can pose similar questions to each other or to the class.*

Lesson 3-12 Tenths of a Centimeter

Standards: 4.OA.2, 4.NF.6, 4.NF.7, 4.MD.1, 4.MD.2

Warm Up /Mental Math and Fluency: Round whole numbers to various places

Focus:

- **Math Message:** Measure to the nearest centimeter and millimeter
- **Introducing Millimeters:** Students are introduced to millimeters
- **Reading decimals:** Practice reading decimals
- **Converting centimeters and millimeters:** Convert rainfall measurements from centimeters to millimeters and plot and compare data

Practice:

- **Reviewing Quadrilaterals and Right Triangles:** Identifying properties in polygons
- **Math Boxes** 3-12: MJ1 page 101, fraction circles
- **Home Link** 3-12: Measure objects in centimeters and millimeters and complete conversion tables

Assessment: MJ1 page 99; Expect that most students will accurately plot the cities on the scale in Problem 1.

Differentiation Options:

- **Readiness:** To compare millimeters and centimeters, students label a centimeter number line and record millimeter equivalencies on MM page 137.
- **Enrichment:** To explore metric unit language, students research how prefixes are used to identify length measured in meters.
- **Extra Practice:** To explore the relationship between centimeters and millimeters, students measure line segments and record the lengths in both centimeters and millimeters.
- **Activity Cards:** 37
- **ELL Support:** Preview the map on *SRB* page 284 and point to the locations of the cities cited in the lesson as you say their names: *Salt Lake City, Jacksonville, Birmingham, Topeka, San Diego, Mobile, Indianapolis,* and *Los Alamos.* Point to Chicago and say: *Is this Topeka? Show me Mobile.* Repeat as needed. Then show students a word card with a picture of rain and the words *rainfall* and *precipitation* below it. Point to the picture and then to the raindrops on the map. Have students pronounce some of the decimals, such as *nine and nine-tenths centimeters* or *zero and four-tenths centimeters.* Give them a copy of the word card for reference as they work through the journal pages.

Lesson 3-13 Comparing Decimals

Standards: 4.NF.6, 4.NF.7, 4.MD.2
Warm Up /Mental Math and Fluency: Round numbers to various places

Focus:

- **Math Message:** Write a number sentence using <, > or =
- **Solving Decimal-Comparison Number Stories**: Explore decimal-comparison number stories
- **Comparing Decimals**: Solve number stories and other problems by comparing decimals

Practice:

- **Game - Fraction Match**: Practice identifying equivalent fractions
- **Math Boxes** 3-13: MJ1 page 103
- **Home Link** 3-13: Compare decimals, write the values of the digits in decimals, and continue decimal number patterns

Assessment: MJ1 page 102; Expect that most students will accurately compare decimals using a model in Problems 1 and 2.

Differentiation Options:

- **Readiness:** To compare decimals in a money context, students play *Coin Top-It* according to directions on Activity Card 38. Ask students to record their decimal comparisons and write < or > as appropriate on the *Top-It* Record Sheet.
- **Enrichment:** To explore comparing and ordering decimals, students record decimals between whole numbers and plot them on number lines. In partnerships, they discuss how they knew where to locate the decimals.
- **Extra Practice:** To practice comparing decimals to the hundredths place, students play *Decimal Top-It* on a decimal mat with number cards.
- **Activity Cards**: 38-39
- **ELL Support:** Prior to the lesson, review the symbols <, >, and =. Show the two numbers 1.4 and 2.6 with a < sign inserted between them. Use gestures to model the relationship, saying: *One and four-tenths is less than two and six-tenths.* Repeat with other pairs of numbers to give students experience with the terms *less than, greater than,* and *equal to.* Allow students to work in pairs to practice creating and solving their own problems.

Lesson 3-14 (2-day lesson) Unit3 Progress Check

Standards: 4.NBT.5, 4.NF.1, 4.NF.2, 4.NF.6, 4.NF.7, 4.MD.1

Warm Up / Self-Assessment: Complete Self-Assessment

Assessment:

- **Unit 3 Assessment:** These items reflect mastery to expectations to this point
- **Unit 3 Challenge** (Optional): Students may demonstrate progress beyond expectations
- **Solving the Open Response**: After a brief introduction students make sense of two strategies for comparing fractions and then use drawing to explain each strategy
- **Discussing the Problem:** After completing the problem, students share their drawing and explanations

Looking Ahead:

- **Math Boxes** 3-14: Preview for Unit 4- MJ1 page 104
- **Home Link** 3-14: Students take home the Family Letter that introduces Unit 4.

Differentiation Options: Adjusting the Assessment: See TE for adjustments to the assessment

Student Resources	
Print	Student Math Journal Volume 1 Student Reference Book
Print/Online	Activity Cards EM Games Online
Online	● http://www.abcya.com ● http://www.coolmath-games.com/

Teacher Resources	
Print	Teacher's Lesson Guide Volume 1
Print/Online	● Spiral Tracker ● Math Masters ● Assessment Handbook
Literature Link	Give Me Half
Online	● eToolkit ● ePresentations ● http://www.internet4classrooms.com/common_core/fourth_4th_grade_math_mathematics.htm ● https://www.ixl.com/math/grade-4 ● https://www.youtube.com/channel/UCBuMwlP7kHkNxdPAqtFSJTw ● https://www.youtube.com/watch?v=yWcNQkmpYVk ● https://www.brainpop.com/math/numbersandoperations/

Unit Plan Title	Multi-digit Multiplication
Suggested Time Frame	20 days including flex days

Stage 1: Desired Results

Overview / Rationale

In this unit, students are introduced to the basic principles of multi-digit multiplication by focusing on extending multiplication skills and exploring the partial-products method. They use their knowledge of multiplication to find the areas of rectangles and to convert units of measurement. Student learning will focus on four clusters of the NJ Student Learning Standards for Math (NJSLS-M), Operations and Algebraic Thinking, Number and Operations in Base Ten, Numbers and Operations with Fractions, and Measurement and Data.

Standards

4.OA.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.OA.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.

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.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.NF.6 - Use decimal notation for fractions with denominators 10 or 100.

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.

Technology Integration
__X__ **8.1 Educational Technology:** All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
- Student Websites - Teacher Websites - SMART board
____**8.2 Technology Integration, Engineering, Design and Computational Thinking – Programming** All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

INTEGRATED SOCIAL AND EMOTIONAL LEARNING COMPETENCIES
The following social and emotional competencies are integrated in this curriculum document:

Self-Awareness
_____Recognize one's own feelings and thoughts
_____Recognize the impact of one's feelings and thoughts on one's own behavior
_____Recognize one's personal traits, strengths and limitations
_____Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management
__x__Understand and practice strategies for managing one's own emotions, thoughts and behaviors
__x__Recognize the skills needed to establish and achieve personal and educational goals
__x__Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness
__x__Recognize and identify the thoughts, feelings, and perspectives of others
_____Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
_____Demonstrate an understanding of the need for mutual respect when viewpoints differ
_____Demonstrate an awareness of the expectations for social interactions in a variety of setting

Responsible Decision Making
__x__Develop, implement and model effective problem solving and critical thinking skills
_____Identify the consequences associated with one's action in order to make constructive choices
_____Evaluate personal, ethical, safety and civic impact of decisions

Relationship Skills
_____Establish and maintain healthy relationships
__x__Utilize positive communication and social skills to interact effectively with others
_____Identify ways to resist inappropriate social pressure
_____Demonstrate the ability to present and resolve interpersonal conflicts in constructive ways
_____Identify who, when, where, or how to seek help for oneself or others when needed

In this unit plan, the following 21st Century Life and Careers skills are addressed:				
Check ALL that apply – **21st Century Themes**			**Indicate whether these skills are:** ● **E – encouraged** ● **T – taught** ● **A – assessed** **Career Ready Practices**	
9.1	**Personal Financial Literacy**		E	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		TA	CRP2. Apply appropriate academic and technical skills.
	Money Management			CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management		ETA	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing			CRP5. Consider the environmental, social and economic impacts of decisions.
X	Becoming a Critical Consumer			CRP6. Demonstrate creativity and innovation.
X	Civic Financial Responsibility			CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		ETA	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	**Career Awareness, Exploration, and Preparation**			CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		E	CRP11. Use technology to enhance productivity.
	Career Preparation			CRP12. Work productively in teams while using cultural global competence.

Interdisciplinary Connections

Other standards covered:

RI.4.3 - Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

RI.4.4 - Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a *grade 4 topic or subject area*.

RI.4.7 - 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.

SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly

Essential Questions:	**Enduring Understandings:**
● How are decimals used in the real world? ● Why do we use different units of measurement?	***Students will understand that…*** ● Using decimals in real world situations - i.e. money ● Converting measurements using the Metric system ● Using different operations and strategies to solve number stories involving decimals
Knowledge:	**Skills:**
Students will know… ● A rule for solving extended multiplication facts ● How to make estimates ● To evaluate the reasonableness of estimates ● Partitioning rectangles method to solve multiplication problems ● Conversion of liter to milliliters ● Partial-products multiplication strategy ● Metric system units ● Conversion of kilograms to grams ● Basic principles of multiplication ● How to find the area of rectangles using multi-digit computation ● Lattice method of multiplication	**Students will be able to…** ● Solve multiplicative comparison number stories using multiplication ● Make sense of and articulate a plan for solving multistep number stories involving addition, subtraction, and multiplication, and assess the reasonableness of their answers by comparing them to an estimate ● Read and identify places in numbers through hundred-thousands ● Read and write number names through millions ● Read and write numbers in expanded form through millions ● Compare and order multi-digit whole numbers ● Record comparisons through millions using >, < or = and explain ● Use and explain the standard algorithm to add and subtract multi-digit whole numbers ● Accurately multiply 2-digit by 1-digit whole numbers ● Use a preferred model to represent decimals to hundredths ● Name decimals using base-10 numerals ● Translate between decimal notation and fractions with denominators 10 or 100 ● Solve number stories involving metric units of capacity and mass ● Use a formula to find the perimeters and areas of rectangles

Stage 2: Acceptable Evidence

Assessments	
Formative Assessments: ● Assessment Check-In ● Mental Math and Fluency ● Exit Slips/Slate Assessments ● Informal Observations ● Math Journal ● Home Links ● EDM Games ● Self-Assessment ● Questioning	**Summative Assessments:** ● Beginning of the Year Assessment ● Unit Progress Check ● Open Response ● Quizzes ● Tests ● Student Work Products

Stage 3: Learning Experiences

Lesson 4-1 Extended Multiplication Facts

Standards: 4.OA.2, 4.NBT.1, 4.NBT.5

Warm Up / Mental Math and Fluency: Find factors and identify factors that are prime

Focus:

- **Math Message:** Extend multiplication facts to solve a problem
- **Developing a Rule for Multiplying Ones by Tens and Hundreds**: Develop a rule for multiplying ones by tens and ones by hundreds
- **Extending the Rule for Multiplying Tens by Tens:** Develop a rule for multiplying tens by tens

Practice:

- **Game** - *Rugs and Fences*: Practice finding the perimeters and the areas of rectangles using formulas
- **Math Boxes 4-1**: MJ1 page 107, fraction circles
- **Home Link 4-1**: Solve multiplication puzzles

Assessment: MJ1 page 106; Observe students completing journal page 106. Expect most to use basic facts to calculate fact extensions for problems multiplying 10s by 10s. Many students should also be able to clearly express the rule.

Differentiation Options:

- **Readiness:** To prepare for multiplying multi-digit numbers, students play *Multiplication Top-It.*
- **Enrichment:** To explore very large numbers, students determine how many dots there are on a sheet of paper full of dots 2,000, 5 sheets 10,000, and 50 sheets 100,000. Students use this information and look for patterns to calculate the number of dots in a ream of paper (500 pages) 1,000,000, 10 reams 10,000,000, 100 reams 100,000,000, and 1,000 reams 1,000,000,000.
- **Extra Practice:** For review and practice of extended multiplication facts, students apply the rules for multiplying 1s and 10s by 10s by playing *Beat the Calculator.*
- Activity Cards: 40
- **ELL Support:** To support students' understanding of the term *extend,* show a tape measure. As you extend it, make think-aloud statements like this: *I am extending the tape measure, so it is now longer.* Show an electrical cord that doesn't reach the outlet, and then attach an extension cord, saying: *I made it longer, so I extended it.* Extend the idea of adding on in the sense of making an object longer using another think-aloud as you show $2 * 4$ and then $2 * 40$. Point to 4 on the number line and then move along the line until you get to 40, saying: *I extended 4 to 40 by multiplying it by 10.*

Lesson 4-2 Making Reasonable Estimates for Products

Standards: 4.OA.3, 4.NBT.3, 4.NBT.4, 4.NBT.5

Warm Up / Mental Math and Fluency: Name subsequent multiples in sequences

Focus:

- **Math Message:** Consider amounts of foods they ate in one week
- **Using Food Survey Data to Make Estimates:** Estimate how much of certain foods they eat in one year and review data about average food consumption
- **Making Estimates for Multistep Problems:** Estimate products of large numbers and calculate and assess the reasonableness of answers

Practice:

- **Practicing Multi-digit Addition and Subtraction:** Practice addition and subtraction
- **Math Boxes 4-2:** MJ1 page 110
- **Home Link 4-2:** Use extended multiplication facts to estimate and check the reasonableness of their answers

Assessment: MJ1 page 108; Observe students as they complete the journal page. Expect most students to be able to make sense of the problems, articulate a plan for solving the multistep number stories, and assess the reasonableness of their answers based on their estimates.

Differentiation Options:

- **Readiness:** To practice rounding large numbers, students play *Spin-and-Round.*
- **Enrichment:** To explore estimation strategies, students find missing numbers and digits in multiplication number sentences and problems using place-value structure.
- **Extra Practice:** To practice estimation strategies, students work within a budget of $65 to plan a party for 18 guests, choosing party favors and estimating total costs. Remind students to include Marla and her friends in the total count of party goers.
- **Activity Cards:** 41
- **ELL Support:** Preview the terms *eggs, cups of milk,* and *cups of yogurt* before starting the Math Message. Show pictures of each of these foods and say the names as you touch each picture in turn. Name one and ask students to point to the corresponding picture. Help students develop their everyday language skills when reading *SRB* page 286 aloud by showing a picture of each of the foods mentioned.

Lesson 4-3 Partitioning Rectangles

Standards: 4.NBT.2, 4.NBT.4, 4.NBT.5, 4.MD.3
Warm Up / Mental Math and Fluency: Write numbers in standard notation
Focus:

- **Math Message:** Solve a problem about floor tiling
- **Using a Partitioning Strategy:** Consider various methods for finding area
- **Partitioning to Multiply:** Students are introduced to a multiplication strategy based on partitioning a rectangle
- **Practicing the Partitioning Strategy:** Students work with a partner to model and solve multiplication problems by partitioning rectangles

Practice:

- **Game** - *Factor Captor*: Apply strategies for finding factors of larger numbers
- **Math Boxes 4-3:** MJ1 page 113, fraction circles
- **Home Link 4-3:** Represent and solve multiplication problems by partitioning rectangles

Assessment: MJ1 page 112; Observe students completing journal page. Expect them to partition rectangles to find the answers in Problems 1 through 4.

Differentiation Options:

- **Readiness:** To prepare for partitioning rectangles into manageable parts, students practice decomposing 2-digit numbers. Model the process using the number 27. Have each student build the number 27 using longs and flats. Continue decomposing numbers like 18, 51, and 73 by following the same procedure until students are comfortable with the decomposition structure.
- **Enrichment:** To apply their multiplication skills, students solve an old puzzle involving houses, cats, whiskers, and fleas. Students discuss different ways to solve the problem, write number models with unknowns, and illustrate the situation.
- **Extra Practice:** For additional practice with multiplication strategies, partners create 2-digit by 1-digit multiplication problems with number cards as they work to find higher products to win points.
- **Activity Cards:** 42-43
- **ELL Support:** Scaffold for students' understanding of *partition* by displaying the word and underlining the first four letters. Use gestures to reinforce how a part is a piece of a whole while showing a rectangular grid with more than 10 squares. Use the same prompts as you partition a number into expanded form, repeating as needed.

Lesson 4-4 Converting Liquid Measures

Standards: 4.NBT.4, 4.NBT.5, 4.NBT.6, 4.MB.1, 4.MD2

Warm Up / Mental Math and Fluency: Solve extended multiplication facts

Focus:

- **Math Message:** Consider the units of liters and milliliters
- **Exploring Liters and Milliliters:** Examine measurement scales for liters and milliliters
- **Converting Liters and Milliliters:** Use a table and diagrams to convert measurements
- **Solving Liquid Measurement Number Stories:** Solve stories involving liters and milliliters

Practice:

- **Game** - *Polygon Capture*: Identify polygons by their properties
- **Math Boxes 4-4:** MJ1 page 116, fraction circles or number line
- **Home Link 4-4:** Convert metric units

Assessment: MJ1 page 114; Observe students solving Problems 1 and 2. Although this is their first exposure to liters and milliliters, expect most to convert whole numbers of liters to milliliters when given the relationship 1 L = 1,000 mL. Expect some students to be able to explain that they multiplied the number of liters by 1,000 to find the number of milliliters. For students who struggle, suggest that they show how 1 L = 1,000 mL using a graduated cylinder and a beaker.

Differentiation Options:

- **Readiness:** To explore the relationship between liters and milliliters, students choose the appropriate unit for measuring liquid amounts.
- **Enrichment:** To extend conversion work with liters and milliliters using decimals, students imagine themselves as customers at a store that sells soup in various milliliter and liter containers. They study the menu and combine amounts to complete their purchase requirements in multiple ways.
- **Extra Practice:** To practice converting between liters and milliliters in a real-world situation, students imagine helping a chef find two different ways to purchase bottles of oil that equal the total amount he needs (about 25 L) for a month's worth of recipes.
- **Activity Cards:** 44
- **ELL Support:** Display labeled measuring tools (liter pitcher, graduated cylinder, beaker). Point to each and say its name. Then name the tool and have students point to the tool or picture. Make the pictures available for student reference during the lesson.

Lesson:4-5 (2-day lesson) Walking Away with a Million Dollars

Standards: 4.NBT.1, 4.NBT.5

Warm Up / Mental Math and Fluency: Write large numbers in expanded form

Focus:

- **Math Message:** Determine how many $1 bills would cover a book
- **Making Sense of Strategies:** Find the value of their book if it were made of $5 bills and discuss strategies
- **Solving the Open Response Problem:** Decide whether students could fit one million dollars in a box of a given size and explain how they know their answers make sense

Focus:

- **Setting Expectations:** Review the open response problem and discuss what a good response might include. They also review how to discuss others' work respectfully.
- **Reengaging in the Problem:** Examine others' work using a rubric as a guide or in a class discussion.
- **Revising Work:** Revise their work from Day 1.

Practice:

- **Math Boxes 4-5:** MJ1 page 118
- **Home Link 4-5:** Determine how many calculators will fit in a box

Assessment: Open Response; Collect and review students' revised work. Expect students to improve their work based on the class discussion. For the content standard, expect most students to accurately multiply with multi-digit numbers.

Differentiation Options:

- Adjusting the Activity: For students who have difficulty explaining their reasoning in writing, use sentence frames like these to help them get started: "First I _____. Then I _____. Finally I _____." Encourage them to use drawings to show their reasoning. For students who complete the problem early, ask them to determine if a student could carry the box with one million dollars in $100 bills. Each bill weighs 1 gram.
- ELL Support: Prior to the lesson, use stacks of pattern blocks or other manipulatives to review the meaning of terms in the open response problem, such as *stack* and *ream*. Use visuals, simple stories, or examples to review other contextual terms, such as *heroic, deed,* and *reward*. Describe or illustrate different meanings of the term *bill*.

Lesson 4-6 Introducing Partial-Products Multiplication

Standards: 4.NBT.2, 4.NBT.4, 4.NBT.5, 4.MD.3

Warm Up / Mental Math and Fluency: Round large numbers to various places

Focus:

- **Math Message:** Solve a number story involving area
- **Introducing Partial-Products Multiplication:** Discuss strategies for multiplying a 3-digit number by a 1-digit number
- **Practicing Partial-Products Multiplication:** Practice multi-digit multiplication using partial products
- **Connecting Multi-digit Multiplication Representations:** Match partitioned rectangles to partial products

Practice:

- **Metric Measurement Conversions:** Practice converting metric units
- **Math Boxes 4-6:** MJ1 page 123
- **Home Link 4-6:** Use partial-products multiplication

Assessment: MJ1 pages 12-121; Circulate and observe students working on journal pages. Expect them to solve Problems 1 and 2 correctly by partitioning and also to apply partial products to these two problems. Some students may be able to use partial-products multiplication independently on journal page 121. Students will practice this method through various contexts over the next several lessons.

Differentiation Options:

- **Readiness:** To support their understanding of partial products multiplication, students practice decomposing 3- and 4-digit numbers. Have students decompose the number 375 into 100s, 10s, and 1s and use base-10 blocks to model the decomposed number.
- **Enrichment:** To explore an early algorithm for multiplication, partners study an example of an ancient Egyptian method for multiplying.
- **Extra Practice:** To practice multiplication strategies, partners play Part 2 of *Products for Points,* in which they use number cards to create 3- and 4-digit by 1-digit multiplication problems.
- **Activity Cards:** 45-46
- **ELL Support:** Scaffold students' understanding of the term *partial* by focusing on the base word, *part*. Display a tower of connecting cubes. Count the cubes together with the students. Think aloud: *This is too tall. I am going to take this tower and break it into smaller* parts. Break the tower into two parts. Say: *Now I have two* parts. Count the number of cubes in each part aloud. Each time, emphasize the word *part* with statements like these: *This* part *has 10 cubes. That* part *has 4 cubes. The two* parts *together make 14 cubes.* Repeat as needed.

Lesson 4-7 Metric Units of Mass

Standards: 4.NBT.4, 4.NBT.5, 4.NBT.6, 4.MD.1, 4.MD.2

Warm Up / Mental Math and Fluency: Compare number using < and >

Focus:

- **Math Message:** Use a measurement scale to answer questions
- **Measuring Mass in Metric Units:** Use a measurement scale to discuss the relationship between kilograms and grams
- **Converting Units of Metric Mass:** Solve measurement number stories
- **Solving Metric Mass Number Stories:** Solve more measurement number stories

Practice:

- **Game** - *Fraction/Decimal Concentration*: Find fraction and decimal equivalencies
- **Math Boxes 4-7:** MJ1 page 126
- **Home Link 4-7:** Convert kilograms to grams and solve number stories

Assessment: MJ1 pages 124; Observe students solving Problems 1 and 2. Although this is their first exposure to kilograms and grams, expect them to convert whole numbers of kilograms to grams when given the relationship 1 kg = 1,000 g. Expect some to explain that they multiplied the number of kilograms by 1,000 to find the number of grams.

Differentiation Options:

- **Readiness:** To experience a hands-on comparison of grams and kilograms, students hold and compare familiar objects of a given metric mass.
- **Enrichment:** To extend their understanding of the metric system, students visit the National Institute of Standards and Technology website and identify the base units of the seven measures included in the International System of Units (SI).
- **Extra Practice:** To practice converting kilograms to grams, students complete a chart detailing the masses of marine mammals and their food intake.
- **Activity Cards:** 47
- **ELL Support:** Help students gain familiarity with the terms *weigh* and *weight* by passing around a heavy object and a light object (such as a hardcover book and a paper clip). Use think-alouds.

Lesson 4-8 Money Number Stories

Standards: 4.NBT.2, 4.NBT.4, 4.NBT.5, 4.MD.1, 4.MD.2

Warm Up / Mental Math and Fluency: Read numbers

Focus:

- **Math Message:** Solve a multistep number story about money
- **Solving Money Conversion Problems:** Solve problems involving conversion between monetary units
- **Solving Money and Time Number Stories:** Solve multistep number stories about time and money

Practice:

- **Game** - *How Much More?* Solve number stories involving additive and multiplicative comparisons
- **Math Boxes 4-8:** MJ1 page 127
- **Home Link 4-8:** Make plans for solving multistep number stories involving money

Assessment: MJ1 pages 128-129; Take note of students' answers to Problems 2 and 4 on journal pages 128 and 129, expecting that they will accurately use a multiplication strategy to find the cost of buying multiple tickets. For those who struggle applying a multiplication strategy, work through one of the problems using the partial-products method and connecting the products to repeated addition. Encourage students who excel at solving the problems to complete the Enrichment activity for this lesson.

Differentiation Options:

- **Readiness:** For experience exchanging money amounts, students play *Dollar Exchange*.
- **Enrichment:** To create multistep number stories involving real-life situations, students use the table on MJ1 page 128 to write problems based on travel times and fares for train and bus trips. They compare solutions with a partner, analyzing strategies and discussing any disagreements or errors.
- **Extra Practice:** For experience computing with money, students solve multistep number stories about purchasing items from an electronics store. They add, subtract, and multiply to find total costs, figure change, and estimate whether they have enough to purchase certain items. They write equations to show each step toward their solutions.
- **Activity Cards:** 48-49
- **ELL Support:** Role-play the Math Message problem using play money with each of the denominations noted in the problem. Pretend to distribute the amounts in the problem to individual students in the classroom.

Lesson 4-9 Partial-Products Multiplication

Standards: 4.NBT.2, 4.NBT.4, 4.NBT.5

Warm Up / Mental Math and Fluency: Solve extended multiplication facts

Focus:

- **Math Message:** Solve a 2-digit by 2-digit multiplication problem
- **Multiplying by a Multiple of Ten:** Solve 2-digit by 2-digit multiplication problems in which the multipliers are multiples of 10
- **Two-Digit by Two-Digit Multiplication:** Use partial products to solve multiplication problems
- **Connecting Multi-digit Multiplication Representations:** Match partitioned rectangles to partial products

Practice:

- **Game** - *Fraction Top-It*: Compare fractions
- **Math Boxes 4-9:** MJ1 page 132
- **Home Link 4-9:** Practice using partial products to solve number stories

Assessment: Observe as students match cards. Expect them to correctly match most of the partial-products multiplication cards to rectangular representations.

Differentiation Options:

- **Readiness:** To prepare for 2-digit by 2-digit multiplication, students play an extended-facts version of *Multiplication Top-It* by attaching a 0 to either one or both numbers before finding the product. Observe students playing and listen as they discuss strategies for solving.
- **Enrichment:** To explore a multiplication strategy from the 1800s, students use a Russian peasant method of multiplication to multiply 2-digit numbers.
- **Extra Practice:** To practice multiplication strategies, partners play Part 3 of *Products for Points,* in which they use number cards to create 2-digit by 2-digit multiplication problems.
- **Activity Cards:** 50-51
- **ELL Support:** Introduce or review the word *match* by showing objects or pictures of objects that are identical, such as socks and earrings, and demonstrating how they are identical. Then introduce the concept of matching objects that go together, such as lowercase and uppercase letters. To help prepare students for matching partial products and their partitioned rectangle representations, use letter-pairing examples to show that matches do not have to be identical.

Lesson 4-10 Multiplication Wrestling

Standards: 4.NBT.2, 4.NBT.4, 4.NBT.5

Warm Up / Mental Math and Fluency: Solve multiplication facts, extended facts, and other problems

Focus:

- **Math Message:** Use a strategy to generate the largest possible product
- **Sharing Solutions:** Share strategies for finding the largest product
- **Game** - *Multiplication Wrestling*: Practice multiplying 2-digit numbers by 2-digit numbers

Practice:

- **Representing Decimals:** Practice writing decimals from different representations
- **Math Boxes 4-10:** Preview for Unit 5 - MJ1 page 134
- **Home Link 4-10:** Practice extended multiplication facts

Assessment: Observe students playing Multiplication Wrestling. Expect most students to be able to accurately decompose each 2-digit number into tens and ones.

Differentiation Options:

- **Readiness:** In preparation for adding partial products in *Multiplication Wrestling,* students review partial-sums addition by finding the sum of multi-digit numbers.
- **Enrichment:** To apply their understanding of the Distributive Property of Multiplication over Addition, students use estimation strategies to determine who has the highest score in a *Multiplication Wrestling* competition. Ask students to use the back of the page to explain how they solved Problem 4 and to show their work for Problem 5.
- **Extra Practice:** To investigate common errors that occur while playing *Multiplication Wrestling,* students analyze three *Multiplication Wrestling* situations. They solve the problems on the game record sheet and describe the errors they discover from comparing their strategies with the incorrect computations.
- **Activity Cards:** 52
- **ELL Support:** To build or activate background knowledge about the sport of wrestling, consider showing a video clip from a wrestling match. Show images of the different styles of wrestling found around the world. Finally, show that in tag-team wrestling you compete with the opponents on the other team while working together with your own partner.

Lesson 4-11 Area Models for Rectangles and Rectilinear Figures

Standards: 4.NBT.4, 4.NBT.5, 4.MD.3, 4.G.2
Warm Up / Mental Math and Fluency: Solve multiplication/division number stories

Focus:

- **Math Message:** Find the area of a figure
- **Finding the Area:** Share strategies for finding area when the perimeter and only one side length are known
- **Finding the Area of Rectilinear Figures:** Find areas by subdividing rectilinear figures

Practice:

- **Game** - Fraction Match: Practice recognizing equivalent fractions
- **Math Boxes 4-11:** MJ1 page 136
- **Home Link 4-11:** Find the area of rectilinear figures and rectangles with multidigit side lengths

Assessment: MJ1 page 135; Observe students solving the problems. Expect them to accurately find the areas in Problems 1 and 2 using a formula. Some will be able to find the area of the rectilinear figure in Problem 3a.

Differentiation Options:

- **Readiness:** For practice working with the concept of area and the formula for the area of rectangles, students make as many different rectangles as they can with an area of 36 square units.
- **Enrichment:** To further explore concepts of area and perimeter, students solve problems involving the dimensions of a tennis court.
- **Extra Practice:** To practice finding the area and perimeter of more complex figures, students add nine new cards to the *Rugs* and *Fences* game. These cards have rectilinear shapes that students will partition into rectangles before using the formula to find the area or perimeter.
- **Activity Card:** 18
- **ELL Support**: Use role playing to introduce the term *adjacent* by associating it with the more familiar term *next to.* Have students point to other things in the classroom that are adjacent to each other.

Lesson 4-12 Multistep Multiplication Number Stories

Standards: 4.OA.3, 4.NBT.3, 4.NBT.4, 4.NBT.5

Warm Up / Mental Math and Fluency: Solve division facts and extended facts

Focus:

- **Math Message:** Solve a multistep multiplication number story
- **Applying Multiplication Strategies:** Estimate, solve, and check the reasonableness of both the answers and the estimates to problems
- **Solving Multistep Number Stories:** Estimate, solve, and use their estimates to assess the reasonableness of the answers to problems

Practice:

- **Game** - Number Top-It: Compare large numbers
- **Math Boxes 4-12**: MJ1 page 139
- **Home Link 4-12:** Solve multiplication number stories

Assessment: MJ1 page 137; Observe students' answers to Problem 1. Expect them to write appropriate number models for the number story and to solve them. Some may not be able to correctly assess the reasonableness of their answer if they use front-end estimation.

Differentiation Options:

- **Readiness:** To further understand problem solving, students use the Guide to Solving Number Stories on *SRB* pg. 26 to help solve the following multistep number story: *Lilly wants to adopt a dog from the shelter. The fees are $211. Lily has saved $175, and she can get $3 off for every hour she volunteers at the pet shelter. How many hours does she need to volunteer?* Help students see that solving the number story takes more than one step. Refer students to the Guide and ask them how they would solve the problem.
- **Enrichment:** To further explore strategies for solving multistep multiplication number stories, students write a number story requiring at least three steps, one of which involves multi-digit multiplication. They solve the number story, trade with a partner, and solve each other's problem. Students discuss solutions, analyzing any mistakes or differences of opinion.
- **Extra Practice:** To practice solving multistep multiplication number stories, partners find solutions to problems involving a pedometer reading, yard work, and planting bulbs. Partners plan strategies and write number models, explaining in words how they found each answer and checking to make sure it makes sense.
- **Activity Card:** 53
- **ELL Support:** Students may be familiar with the term *step* as steps in a staircase or the steps we take when walking. Help them understand the adjectives *one-step* and *two-step*

by connecting them to the sequential terms *first* and *second*. Demonstrate with examples that deal with procedures.

Lesson 4-13 Lattice Multiplication

Standards: 4.NBT.5
Warm Up / Mental Math and Fluency: Write numbers and find values of digits

Focus:
- **Math Message:** Compare two ways of solving multiplication problems
- **Exploring the Lattice Method of Multiplication:** Learn about and practice lattice multiplication
- **Using the Lattice Method with 2-Digit Multipliers:** Practice solving multi-digit multiplication problems using the lattice method

Practice:
- **Game** - Decimal Top-It: Practice making the largest possible decimal numbers
- **Math Boxes 4-13:** MJ1 page 142
- **Home Link 4-13:** Practice the lattice method of multiplication

Assessment: MJ1 page 141; Observe students using the lattice method to solve Problems 2 and 3. Expect them to be able to apply the method.

Differentiation Options:
- **Readiness:** Beat the Calculator Game -To prepare for lattice multiplication, students practice basic multiplication facts.
- **Enrichment:** To apply their understanding of lattice multiplication, students use Napier's Rods to multiply 2-, 3-, and 4-digit numbers by a 1-digit number.
- **Extra Practice:** To practice the lattice method of multiplication, students solve problems on *MM* pg. TA39. Fill in the problems for students, and include zeros in some of the factors.
- **ELL Support:** To scaffold students' understanding of the term *lattice,* display visual examples of objects that incorporate lattices, such as fencing. Then show the lattice used for multiplication. As you describe different pieces of both lattices, emphasize terms you will use in the lesson, including *diagonal, right side, top, bottom, outside,* and *inside*. Enunciate the terms clearly, connecting the spoken words with the written words and their counterparts on the lattice. Provide vocabulary cards that students can use to identify each image.

Lesson 4-14 (2-day lesson) Unit 4 Progress Check

Standards: 4.OA.3, 4.NBT.4, 4.NBT.5, 4.NF.6, 4.MD.1, 4.MD.2. 4.MD.3

Warm Up / Self-Assessment: Complete Self-Assessment

Assessment:

- **Unit 4 Assessment:** These items reflect mastery to expectations to this point
- **Unit 4 Challenge (Optional):** Students may demonstrate progress beyond expectations
- **Cumulative Assessment:** These items reflect mastery expectations to this point

Look Ahead:

- **Math Boxes 4-14:** Preview for Unit 5- MJ1 pg. 143
- **Home Link 4-14:** Students take home the Family Letter that introduces Unit 5

Differentiation Options: Adjusting the Assessment - See TE for adjustments to the assessment.

Student Resources	
Print	Student Math Journal Volume 1 Student Reference Book
Print/Online	Activity Cards EM Games Online
Online	http://www.abcya.com http://www.coolmath-games.com/

Teacher Resources	
Print	Teacher's Lesson Guide Volume 1
Print/Online	Spiral Tracker Math Masters Assessment Handbook
Online	eToolkit ePresentations http://www.internet4classrooms.com/common_core/fourth_4th_grade_math_mathematics.htm https://www.ixl.com/math/grade-4 https://www.brainpop.com/math/numbersandoperations/

	https://www.youtube.com/channel/UCBuMwlP7kHkNxdPAqtFSJTw

Unit Plan Title	Fraction and Mixed Number Computation; Measurement
Suggested Time Frame	19-20 days including flex/game days

Stage 1: Desired Results

Overview / Rationale

In this unit, students explore the whole in fractions as well as adding and subtracting fractions and mixed numbers. Students use these computation skills to answer questions about line plots. They are also introduced to adding tenths and hundredths. Students build on their knowledge of rays to explore unit iteration for angles. Student learning will focus on two clusters of the NJ Student Learning Standards for Math (NJSLS-M), Numbers and Operations with Fractions and Measurement and Data.

Standards

4.NF.3a Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

4.NF.3b Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. 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:* $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2\ 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.

4.NF.3c Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. 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.NF.3d Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. 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.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.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**.**

4.MD.5a 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.

4.MD.5b Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: an angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.

Technology Integration
__X__ **8.1 Educational Technology:** All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
- Student Websites - Teacher Websites - SMART board
____ **8.2 Technology Integration, Engineering, Design and Computational Thinking – Programming** All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

INTEGRATED SOCIAL AND EMOTIONAL LEARNING COMPETENCIES
The following social and emotional competencies are integrated in this curriculum document:

Self-Awareness
_____Recognize one's own feelings and thoughts
_____Recognize the impact of one's feelings and thoughts on one's own behavior
_____Recognize one's personal traits, strengths and limitations
_____Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management
__x__Understand and practice strategies for managing one's own emotions, thoughts and behaviors
__x__Recognize the skills needed to establish and achieve personal and educational goals
__x__Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness
__x__Recognize and identify the thoughts, feelings, and perspectives of others
_____Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
_____Demonstrate an understanding of the need for mutual respect when viewpoints differ
_____Demonstrate an awareness of the expectations for social interactions in a variety of setting

Responsible Decision Making
__x__Develop, implement and model effective problem solving and critical thinking skills
_____Identify the consequences associated with one's action in order to make constructive choices
_____Evaluate personal, ethical, safety and civic impact of decisions

Relationship Skills
_____Establish and maintain healthy relationships
__x__Utilize positive communication and social skills to interact effectively with others
_____Identify ways to resist inappropriate social pressure
_____Demonstrate the ability to present and resolve interpersonal conflicts in constructive ways
_____Identify who, when, where, or how to seek help for oneself or others when needed

In this unit plan, the following 21st Century Life and Careers skills are addressed:				
Check ALL that apply – **21st Century Themes**			**Indicate whether these skills are:** ● **E – encouraged** ● **T – taught** ● **A – assessed** **Career Ready Practices**	
9.1	**Personal Financial Literacy**		E	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		TA	CRP2. Apply appropriate academic and technical skills.
	Money Management			CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management		ETA	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing			CRP5. Consider the environmental, social and economic impacts of decisions.
X	Becoming a Critical Consumer			CRP6. Demonstrate creativity and innovation.
X	Civic Financial Responsibility			CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		ETA	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	**Career Awareness, Exploration, and Preparation**			CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		E	CRP11. Use technology to enhance productivity.
	Career Preparation			CRP12. Work productively in teams while using cultural global competence.

Interdisciplinary Connections

Other standards covered:

RI.4.3 - Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

RI.4.4 - Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a *grade 4 topic or subject area*.

RI.4.7 - 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.

SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly

Essential Questions:	Enduring Understandings:
● How do I identify the whole? ● How do I explain how changing the size of the whole affects the size or amount of a fraction?	***Students will understand that…*** ● They are able to build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Knowledge:	**Skills:**
Students will know… ● Students explore decomposing fractions into sums of fractions with the same denominator. ● Students practice finding the whole when given a fractional part of a region. ● Students add fractions (of the same whole, with like denominators) to solve number stories. ● Students learn multiple strategies to add mixed numbers with like denominators. ● Students add unlike fractions with tenths and hundredths. ● Students decide how to divide an area of land into parts based on a number story and write a fraction addition. ● Students discuss some solutions and representations and revise their work. ● Students subtract fractions (of the same whole, with like denominators) to solve number stories. ● Students subtract mixed numbers by writing equations, drawing diagrams, and solving number stories. ● Students record data on a line plot and answer questions regarding the data. ● Students explore rotation, iteration of measurement units, and angle measures. ● Students are introduced to the degree as a unit to measure angles. ● Students review line symmetry and explore properties of symmetric shapes.	**Students will be able to…** ● Add fractions using manipulatives and subtract fractions with no regrouping using manipulatives. ● Decompose fractions, represent decompositions with an equation, and explain decompositions using a visual fraction model. ● Add mixed numbers and subtract mixed numbers with no regrouping using manipulatives and visual fraction models. ● Use manipulatives and visual fraction models to add fractions in number stories. ● Add two fractions with denominators 10 and 100 using a model. ● Organize and represent data in 12 and 14 units on line plots and solve addition and subtraction problems about line plot data in 12 and 14 units. ● Recognize that angles are measured in iterations of one-degree angles. ● Solve multistep multiplication number stories and express their solution strategies with appropriate units and number models.

Stage 2: Determine Acceptable Evidence

Assessments	
Formative: ● Assessment Check In ● Mental Math and Fluency ● Exit Slips/Slate Assessments ● Informal Observations ● Math Journal ● Home Links ● EDM Games ● Self Assessment ● Questioning	**Summative:** ● Beginning of the Year Assessment ● Unit Progress Check ● Open Response ● Quizzes ● Tests ● Student Work Products

Stage 3: Plan Learning Experiences

Teaching and Learning Actions

Lesson 5-1 Fraction Decomposition

Standards: 4.NBT.2 , 4.NBT.4, 4.NBT.5

Warm Up/Mental Math: Students write equivalent fractions.

Focus: Math Message - Students use fraction circles to decompose a fraction into a sum of unit fractions. *The red circle is the whole. Use yellow fraction circle pieces to show 3/4*. What equation can you write to show 3/4 as the sum of the yellow fraction circle pieces?

Practice: Students use fraction circles to decompose fractions and mixed numbers into sums of fractions with the same denominators.

- **Games**: Students play a variation of ***Multiplication Top-It*** to practice multiplying 2-digit and 3-digit numbers by 1-digit numbers.
  - For practice multiplying 2- and 3-digit numbers by a 1-digit number, students play an advanced version of *Multiplication Top-It.* They draw three cards to generate a 2-digit by 1-digit multiplication problem and then they solve it.
  - After students have had time to solve their problem, consider having them turn over four cards to form 3-digit by 1-digit problems to solve. Observe students playing and listen as they discuss their solution strategies. GMP7.1, GMP7.2
  - Observe:
    - Which students use all three (or four) cards to form their 2-digit (or 3-digit) number and 1-digit number, so that their product is as large as possible?
    - Which students have a strategy for solving?
  - Discuss:
    - What mathematics did you use in this game?
    - What strategy did you use to find the product?
- **Math Boxes:** *Math Journal 2* pages 155–156
- **Home Link** 5-1

Assessment: Students write equations and shade fraction circles to show fractions as the sum of fractions with the same denominator. Observe students completing journal page 155. Expect most students to be able to successfully use unit fractions to decompose the fractions in Problems 1 and 2 and use fractions with the same

denominator to find at least one equivalent sum for 7/10 in Problem 3. For students who struggle, suggest first using the fraction circle pieces and then using that visual model to help them shade in the appropriate amounts on the journal page. Finally, students write the equation.

Differentiation Options:

- **Readiness**: Decomposing Numbers into Parts
- **Enrichment**: Exploring Fractions with Tangrams
- **Extra Practice**: Decomposing Fractions Greater Than 1
- **Activity Cards:** N/A
- **ELL Support:** Use modeling and think-alouds to explain the meaning of the term *decompose* as "to break apart." For example, begin with a set of 10 counters and say: *I will decompose this set of 10 counters. I will make 2 sets. I will break apart the 10 counters into* _____ 7 *and* _____ 3. *I will decompose 10 into* _____ *and* _____. Direct students to decompose the 10 counters in other ways, and to use the sentence frame: "I decomposed 10 into _____ and _____.

Lesson 5-2 The Whole For Fractions

Standards: 4.NBT.4 , 4.NBT.5

Warm Up/Mental Math: Students find equivalent fractions

Focus: Math Message - Given a fractional part of a region, students find the whole. If a light blue fraction circle piece is 1/3, what single fraction circle piece is the whole? 1 pink

Practice: Students find the whole based on fractional parts of regions and record equations expressing the relationship of parts to whole.

- **Games** - ***Fraction Match*** to practice recognizing equivalent fractions.
  - Students play *Fraction Match* and complete the record sheet when they have finished playing the game.
  - Observe: Which students are using a strategy when playing a WILD card? Which students are matching equivalent fractions?
  - Discuss: With equivalent fractions, how do the number of parts compare? How do you know if your opponent has played an equivalent fraction correctly?
- **Math Boxes:** *Math Journal 2* pages 157- 158
- **Home Link** 5-2

Assessment: Students find the whole, given a fractional part of a region, and write an equation to represent the problem. Observe as students work on journal page 157. Expect most students to be able to use manipulatives to find the whole in Problems 1–2 when the given fractional part of the region is a unit fraction. Some may be able to solve Problems 3–5, which involve a given fractional part of the region that is a non-unit fraction. For students who struggle, suggest that they solve Problems 1–2 by finding the number of pieces of the same color that would make a whole. For instance, in Problem 1 they should get the answer *2 yellows*. Then encourage students to look for single pieces that are the same size as their wholes. Reinforce the idea that the answer could be either a number of fraction circle pieces or a single fraction circle piece.

Differentiation Options:

- **Readiness**: Building Rectangles
- **Enrichment**: Finding the Candy Bar Whole
- **Extra Practice:** Finding the Whole
- **Activity Cards**: N/A
- **ELL Support**: Display a vocabulary card showing the term *whole* along with visuals of whole objects, such as apples or oranges, and equal shares of objects. Say: *This is a whole* _____. *I have all of the* _____. Contrast these wholes to parts by showing

a share of a whole, saying: *This is only part of the whole _____. I don't have all of the _____.*

Lesson 5-3 Adding Fractions

Standards: 4.NBT.4, 4.NBT.5 , 4.NF.1

Warm Up/Mental Math: Students solve multiplicative comparison number stories.

Focus: Math Message

- *Draw a picture on your slate to help you solve the number story.*
- *Radhika ate 13 of a small peach tart. Briana ate 13 of another peach tart that was the same size. Together* how much peach tart did they eat? 23 of a small peach tart
- *Write an equation to show how much peach tart the girls ate together.* 13 + 13 = 23

Practice: Students find the whole based on fractional parts of regions and record equations expressing the relationship of parts to whole.

- **Games:** Students solve problems involving naming, representing, comparing, and ordering decimals. GMP3.2, GMP6.1
- **Math Boxes:** *Math Journal 2* pages 159–161
- **Home Link** 5-3

Assessment: Students share strategies to solve fraction addition number stories. Observe students completing journal page 159. Expect most to be able to solve Problems 1 and 2 using a strategy. Help those who struggle by modeling the problem using a manipulative and emphasizing the connections among the different representations. Encourage students who complete all parts successfully to create a number story, write one equation, and illustrate how to solve it in two ways.

Differentiation Options:

- **Readiness :** Composing Fractions with Fraction Circles
- **Enrichment :** Investigating Egyptian Fractions
- **Extra Practice:** Adding Fractions: "What's My Rule?" Problems
- **Activity Cards :** N/A
- **ELL Support:** Scaffold students' understanding of the problem contexts of number stories by accompanying spoken and written presentations with visual aids, which help beginning ELL students attend to the mathematical content of the lesson. In addition, provide a pictorial dictionary source or maintain a display of words with pictures for students' reference when solving number stories.

Lesson 5-4 Adding Mixed Numbers

Standards: 4.NF.3.a, 4.NF.3.b , 4.NF.3.c , 4.NF.3.d

Warm Up/Mental Math: Students represent fractions as decimals.

Focus: Math Message - Students write a mixed number as an equivalent fraction and explain their solution. *Use fraction circles or the Number-Line Poster to solve this problem on your slate. Be prepared to explain how you got your answer.*

Practice: Students share strategies for changing mixed numbers into fractions greater than 1 and learn to add mixed numbers with like denominators.

- **Games:** Students practice making the largest decimal numbers by playing ***Decimal Top-It.*** *GMP7.2 See Lesson 4-13 for additional information.*
- **Math Boxes:** *Math Journal 2* pages 162–163
- **Home Link** 5-4

Assessment: Students solve number stories with mixed numbers. Observe students solving the problems on journal page 162. Expect most to be able to solve Problem 1 using a strategy. Encourage students who struggle to work through each step of the problem by modeling the mixed numbers, combining, and then renaming them using a number line or fraction circles. Suggest to students who complete all parts successfully that they write a number story and a number model and illustrate how to solve it in two ways.

Differentiation Options:

- **Readiness:** Composing Mixed Numbers with Fraction Circles
- **Enrichment**: Adding Mixed Numbers with Unlike Denominators
- **Extra Practice:** Give Me 5
- **Activity Cards:** 54
- **ELL Support:** To scaffold understanding of the term *mixed*, build on students' conceptual understanding of *same* and *different*. For example, display a set of red objects and say: *These are all the same*. Then add objects of another color and say: *Now they are not all the same. Some are different. I have a* mixed *set*. Show a bag of something like trail mix, pointing out that it contains *different* items. Extend the idea to mixed numbers, showing how they contain a *mix* of a whole number and a fraction.

Lesson 5-5 Adding Tenths and Hundredths

Standards: 4.NF.3.a, 4.NF.5 , 4.NF.6

Warm Up/Mental Math: Students find equivalent fractions and represent fractions as decimals.

Focus: Math Message

- Students write a number model with an unknown.
- *Alex made a poster with 100 paper clips for the 100th day of school celebration. 210 of the paper clips were gold. 45100 of the paper clips were silver. The rest were other colors.*
- *On your slate, write a number model with an unknown to represent the fraction of paper clips on Alex's poster that are silver or gold.* 210 + 45100 = *c*

Practice: Students discuss different methods for adding tenths and hundredths. Students solve multiplication multistep number stories.

- **Games**: Students solve multiplication multistep number stories.
- **Math Boxes:** *Math Journal 2* pages 164–166
- **Home Link** 5-5

Assessment: Students write equations to solve addition problems with unlike denominators. Observe students working on journal page 164. Expect most to be able to recognize the need in each problem to find an equivalent fraction in the tenths or hundredths as the first step in the addition process. Many students may be able to accurately add fractions with denominators 10 and 100. For students who struggle representing the tenths as hundredths and vice versa, suggest using base-10 blocks.

Differentiation Options:

- **Readiness:** Representing Decimals and Fractions
- **Enrichment**: Using Coins to Add Fractions
- **Extra Practice:** Practicing Adding Tenths and Hundredths
- **Activity Cards: 55**
- **ELL Support:** Many English language learners have difficulty with the *th* sound. Scaffold to help them differentiate between the terms *ten, tens,* and *tenths; hundred, hundreds,* and *hundredths;* and *thousand, thousands,* and *thousandths*. Also help students pronounce the words correctly by providing oral language practice with the word groups. Display the related words and corresponding number forms, pointing to the word endings as you model the pronunciation of individual words, and have students repeat them.

Lesson 5-6 Open Response Queen Arlene's Dilemma (Day 1)

Standards: 4.NF.3.a, 4.NF.3.b, 4.OA.1

Warm Up/Mental Math: Students record multiplicative comparison equations.

Focus: Math Message - Students find combinations of fraction circles that make up 1 whole and write fraction addition equations. *Complete journal page 167.*

Practice:

- Students share their combinations of fraction circles that make 1 whole and their fraction addition equations.
- Students show how to divide an area of land into fractional parts based on a number story and write a fraction addition equation to represent the partitioning.
- Distribute *Math Masters,* page 203. Read the problem as a class and have partners discuss what the problem is asking them to do. Point out that a *dilemma* is a problem or a situation that poses difficult choices. Make fraction circle pieces available, but encourage students to choose their own representations.
- For students who have difficulty getting started, suggest drawing a diagram of the land as they think it might look. Then have them divide the land according to the problem. GMP1.3, GMP2.1
- Listen as partners work. As needed, ask clarifying questions like these:
- How many people are sharing the land in each problem? 3 people in Problem 1; 4 in Problem 2
- How much of her land is the queen planning to give away to her daughters in each problem? All of the land in Problem 1; 12 of it in Problem 2
- **Math Boxes:** *Math Journal 2:* p. 167

Differentiate Common Misconceptions

- Students sometimes lose track of the whole while working on a problem. In the diagram shown for Problem 2a, the student drew the larger outer rectangle to show the boundaries of the whole of the queen's land. However, once the queen's half was partitioned, the student erroneously reinterpreted the right half of the land as a new whole and labeled the older daughter's part as 12 and each of the other two daughters' parts as 14.

- For students who struggle writing their explanations, suggest that they think about their diagram in conjunction with a simple sentence frame for Problem 1, such as, "Queen Arlene's plan does/does not work because _____." For Problem 2, suggest that they think about how their diagram shows what is in the number story. Use a sentence frame

such as, “My diagram shows that Queen Arlene got _____ of the land and her oldest daughter got more/less than her sisters. You can tell because _____.”

- Differentiate: Adjusting the Activity
- Ask students who finish early to find more than one way for Queen Arlene to divide her land in Problem 2. Remind them that the two younger daughters can get the same or different amounts of land. Sample answers: 12 + 13 + 112 + 112; 12 + 14 + 316 + 116

- **ELL Support**
  - Prior to the lesson, role-play the concept of Queen Arlene’s dilemma using an easier situation, such as four children who each get one-fourth of the land or $1,000 divided equally among five children. Preview some of the vocabulary in the Math Message activity, such as *whole, sum, fraction addition equation,* and *combination.*
  - Student Learning Center Note
  - SLC4: (S6): Solve the Problem and Revise
  - It may be preferable for students to work on print copies of the *Math Masters* page so they can easily refer to all the problems as they work and have room to show their work and explain their thinking fully. If you choose to have students work with paper and pencil, you will need copies of *Math Masters,* page 203.
  - *Screens 1–2:* Students will be asked to revise their work on these screens in Lesson 5-6, Day 2. Choose one pen color for all students to use for their work on Day 1 and a second color for Day 2. Remind students that they may use the Scratchpad as needed to continue their explanations.
  - Point out that these screens feature eTools. Remind students how to access and use the eTools.

  Differentiation Options: In Open Response and Reengagement Lessons, differentiation is integral to the reengagement process, so separate Readiness, Extra Practice, and Enrichment activities are not provided.
- **Activity Cards :** N/A
- **ELL Support:** It can be challenging for English Language Learners to share their thinking with a partner or with you, and in particular, to write about how they solved a problem. In Open Response and Reengagement lessons, it is critical to be able to distinguish whether children’s difficulties with a concept stem from mathematical or language issues. Using models, pictures, and other visual representations and gestures in the questions you pose may help you discern the source of difficulty. Also encourage English Language Learners to use pictures, number models, and symbols to explain their thinking.

Lesson 5-6 Open Response Queen Arlene's Dilemma (Day 2)

Standards: 4.G.1, 4.NBT.4, 4.NF.1, 4.NF.3.a , 4.NF.3.b, 4.NF.3.c, 4.NF.5 , 4.NF.7

Warm Up/Mental Math: Students review the open response problem and discuss how representations are used to make sense of the problem. They also review how to respectfully discuss others' work.

Focus: Math Message - Reengaging in the Problem: Students make sense of others' representations and make connections among them**.** Students reengage in the problem by analyzing and critiquing other students' work in pairs and in a whole-group discussion. Have students discuss with partners before sharing with the whole group. Guide this discussion based on the decisions you made in Getting Ready for Day 2. GMP1.3, GMP2.1, GMP2.2

Practice:

- **Math Boxes:** *Math Journal 2* page 168
- **Home Link** 5-6

Assessment: Collect and review students' revised work. Expect most students to improve their work based on the class discussion. For the content standards, expect students to find that in Problem 1, Queen Arlene cannot divide the land as she wanted because the sum of the parts of the land would be greater than 1. Expect students to find an answer for Problem 2 that has a sum of 1. You can use the rubric below to evaluate students' revised work for GMP2.2.

Differentiation Options: In Open Response and Reengagement Lessons, differentiation is integral to the reengagement process, so separate Readiness, Extra Practice, and Enrichment activities are not provided.

Lesson 5-7 Subtracting Fractions

Standards: 4.NF.3.a, 4.NF.3.b, 4.NF.3.d

Warm Up/Mental Math: Students show how the Equivalent Fractions Rule can be used to name equivalent fractions.

Focus: Math Message - Students solve a fraction number story.

- *Solve. Be prepared to show or explain how you got your answer.*
- Ella bought 78 of a yard of fabric to make a pillowcase. She used only 58 of a yard. How much fabric does she have left? 28 of a yard

Practice: Students share strategies for solving a fraction number story.

- **Games:** Students practice multiplying 2-digit by 2-digit numbers by playing *Multiplication Wrestling*. GMP7.1, GMP7.2 See Lesson 4-10 for details.
- **Math Boxes:** *Math Journal 2* pages 169–170
- **Home Link** 5-7

Assessment: Students share strategies to solve fraction number stories. Observe students completing journal page 169. Expect most to be able to solve Problems 1 and 2 using a strategy. For students who struggle, model the problems using whichever manipulative works best for them. Help them connect the work they do with manipulatives to fraction notation as they write their answer. GMP2.3 For students who are ready for a challenge, suggest that they try problems with unlike denominators, such as 5/6 – 1/2.

Differentiation Options:

- **Readiness:** Subtracting Fractions with Fraction Circles
- **Enrichment:** Writing Fraction Subtraction Number Stories
- **Extra Practice:** Subtracting Fractions: "What's My Rule?"
- **Activity Card:** 56
- **ELL Support:** To help students understand the number stories as they are reading them, maintain a display of words with corresponding pictures for them to refer to as they work. Examples include: a picture of rain, labeled rain/precipitation for Problem 1; and a labeled picture of lasagna and the ingredients needed in Problem 2. These aids will allow students to focus on the mathematical content**.**

Lesson 5-8 Subtracting Mixed Numbers

Standards: 4.NF.3.a , 4.NF.3.b , 4.NF.3.c , 4.NF.3.d

Warm Up/Mental Math: Students identify equivalent fractions.

Focus: Math Message - Students solve a subtraction number story involving mixed numbers. *Solve this problem on your slate. Be prepared to show or explain how you got your answer. Use fraction circles or the Number-Line Poster to help. i.e. The art students had 32/3 gallons of paint for the school play scenery. They used 21/3 gallons.* How many gallons were left when the students finished painting? 11/3, or 43 gallons of paint

Practice: Students discuss how to subtract mixed numbers with like denominators.

- **Games:** Students match equivalent fraction and decimal cards by playing *Fraction & Decimal Concentration* GMP2.3 See Lesson 4-7 for details.
    - Observe: Which students systematically pick up cards? Which students are consistently able to make matches?
    - Discuss: How do you remember what cards are in what position? How does this game help you remember the equivalence between the fractions and the decimals?
- **Math Boxes:** *Math Journal 2* pages 171–172
- **Home Link** 5-8

Assessment: Students solve subtraction number stories involving fractions and mixed numbers with like denominators. Observe students completing journal page 171. Expect most to be able to solve Problems 1 and 2 using a strategy. Encourage students who struggle to work through each step by modeling the mixed numbers, taking pieces away, and then renaming using fraction circles. For students who complete all parts successfully, suggest that they write a number story and illustrate how to solve it in two ways.

Differentiation Options:

- **Readiness:** Decomposing Mixed Numbers
- **Enrichment:** Subtracting Mixed Numbers with Unlike Denominators
- **Extra Practice:** Subtracting Mixed Numbers with Frames and Arrows
- **Activity Cards:** N/A
- **ELL Support:** Build understanding of *like* using the terms *same* and *alike*. Show pairs of objects and model comparing them by pointing to like attributes and using think-alouds: _____ *is like* _____. *They have the same* _____. _____ and _____ *are alike because* _____. Give students various objects and direct them to find two objects that are alike, like each other, or the same. Encourage students to repeat statements in which the terms are used.

Lesson 5-9 Line Plots

Standards: 4.MD.4

Warm Up/Mental Math: Students distinguish fraction sums more or less than 1 whole.

Focus: Math Message - Students write a question for line plot data. *Look at the line plot on* Student Reference Book*, page 215. Write one question that can be answered by using the information presented in the line plot.*

Practice: Students pose questions to the class. Students solve multiplicative comparison number stories.

- **Games:** Students solve multiplicative comparison number stories and record equations**. GMP2.1**
- **Math Boxes:** *Math Journal 2* pages 174–175
- **Home Link** 5-9

Assessment: Students use data to create a line plot and answer questions.
Observe students completing journal page 174. Expect that most should be able to correctly solve Problems 8–10. Watch for students who struggle trying to add or **subtract** fractions and mixed numbers. Suggest that they use manipulatives to model the equations. GMP4.2

Differentiation Options:

- **Readiness:** Making a Line Plot with Whole-Number Units
- **Enrichment:** Comparing Line Plots
- **Extra Practice:** Making a Line Plot
- **Activity Card:** 58
- **ELL Support:** Frontload vocabulary students will need for the lesson by preparing an anchor chart titled "Line Plots" and vocabulary cards with the words *title*, *unit*, *horizontal,* and x-*axis*. Draw a line plot on the chart and use a think-aloud to name and label the different features of the line plot with the vocabulary terms. For example, place the vocabulary card for horizontal *axis* on the axis as you say the term and have students repeat it. After modeling for all the terms, display another line plot. Give students another set of vocabulary cards and invite volunteers to label features you name. Encourage students to say the names of the features.

Lesson 5-10 Rotations and Iterating Angles

Standards: 4.G.1 , 4.MD.5.a, 4.MD.5.b

Warm Up/Mental Math: Students convert measurement units**.**

Focus: Math Message: Students consider the attribute of angle size.

- *Look at angle* A *and angle* B *on Math Masters, page 212.*
- *Suma looked at the two angles. Without measuring them she said, "Angle* B *is larger than angle* A." Do you agree with Suma? Why or why not?

Practice: Students discuss the need for a standard unit of measure.

- **Games:** Students practice adding fractions by playing ***Fishing for Fractions (Addition).*** This is a game in which they "fish" for pairs of fraction cards with like denominators and then add them together. Students record equations representing these fraction addition problems on Math Masters, page G37.
    - Observe: Which students ask for fractions with like denominators? Which students are able to accurately add fractions? GMP6.4
    - Discuss: What mistakes did you or your group make when adding fractions? How can manipulatives help you with this game?
- **Math Boxes:** *Math Journal 2* pages 178–180
- **Home Link** 5-10

Assessment: Students practice different types of turns and relate them to benchmark angles. Most students should be able to describe the measure of the angles in Problems 1-4 on journal page 178 based on the amount of rotation. For students who struggle, suggest using straws to model the rotation in each angle, as in the procedure above. Students start with both straws positioned on one ray of the angle and then rotate one straw in the direction indicated by the arc until it aligns with the other ray. Ask guiding questions like these: How far did you rotate the straw? What part of a full-turn was it?

Differentiation Options:

- **Readiness:** Revisiting Angles and Rays
- **Enrichment**: Time for Angles
- **Extra Practice:** Finding Angles in the Classroom
- **Activity Cards: 59–60**
- **ELL Support:** Introduce students to the multiple uses of the word *spread* by preparing images to illustrate its meaning as extending over an area. Display images of actions such as jam being spread on toast, a swan spreading its wings, and a newspaper spread open. Point to each image as you say the term and have students repeat it to help them construct the meaning. Also illustrate the meaning using gestures like moving your hands close together and then spreading them far apart.

Lesson 5-11 Unit Iteration for Angles

Standards: 4.G.1, 4.MD.5.a, 4.MD.5.b

Warm Up/Mental Math: Students convert measurement units.

Focus: Math Message - Students consider the need for a standard unit of measure. Keon used purple wedges to measure an angle. Latitia measured the same angle using light green wedges. Keon said the angle's measurement was 5 wedges. Latitia said the angle's measurement was 6 wedges. Who is correct? How do you know?

Practice: Students discuss the need for a standard unit of measure.

- **Games**: To practice comparing fractions and justifying comparisons, have students play ***Fraction Top-It.*** GMP3.1 See Lesson 3-11 for details.
  - Observe: Which students can determine the larger fraction easily? Which students can make equivalent fractions with common denominators to prove which fraction is bigger?
  - Discuss: What strategies did you use when choosing the fraction card? What did you find challenging about this game
- **Math Boxes:** *Math Journal 2* pages 181–183
- **Home Link** 5-11

Assessment: Students use benchmark angles to estimate the measure of angles. Expect students to be able to correctly identify the angles on journal page 183 as acute, right, or obtuse and to produce estimates that fall within the corresponding range (for example, an acute angle is estimated at less than 90°). Watch for students who struggle making reasonable estimates. Have them trace the arc of each angle with their finger; ask questions such as these to guide them as they identify the type of angle and range of reasonable estimates: Is the measure of this angle more than 90°? Less than 180°? Etc.

Differentiation Options:

- **Readiness :** Standard Units of Measure
- **Enrichment** : Clock Angles
- **Extra Practice :** Paper Plate Angle Makers
- **Activity Cards : 61**
- **ELL Support:** Students may be more familiar with the term *degree* as it relates to temperature than to geometry. Use visuals and think-alouds to help them construct a new understanding of the term. For example, show a picture of a sunny, warm day and a thermometer, display the word *degrees*, and say: *It is warm outside. It is 80 degrees outside. Degrees measure temperature.* Then show an angle, post the word *degrees*, and say: *This is a 45-degree angle. Degrees measure angles, too. Degrees can measure temperature and angles. However the degrees used to measure temperature are not the same as degrees used to measure angles.*

Lesson 5-12 Creating Symmetric Figures

Standards: 4.G.3

Warm Up/Mental Math: Students convert measurement units.

Focus: Math Message - Students fold and cut out a symmetric figure**.** *Take a copy of* Math Masters, *page 216. Use a straightedge to draw line segments to connect the dots in order:* A *to* B, B *to* C, *and so on. Fold along the dotted line with the picture on the outside. Keep it folded. Cut along the solid lines. Unfold. Name the figure.*

Practice: Students discuss properties of symmetric figures. Students use the four operations to solve measurement number stories involving units of liquid measure, mass, and time.

- **Games**: Solving Measurement Number Stories - Students use the four operations to solve measurement number stories involving units of liquid measure, mass, and time. Students use the four operations to solve measurement number stories involving units of liquid measure, mass, and time.
- **Math Boxes:** *Math Journal 2* pages 184–186
- **Home Link** 5-12

Assessment: Students complete symmetric figures creating reflections. Circulate and observe students working on journal page 184. Expect most to be able to accurately draw the matching half of the shapes in Problems 5 and 6. Some students may be able to accurately draw the other half of the shapes in Problems 7 and 8. For students who struggle, suggest that they trace the half shape onto paper and then fold along the line of symmetry to see the matching half. They can then trace the other half. GMP7.2

Differentiation Options:

- **Readiness:** Exploring Reflections
- **Enrichment**: Solving Pattern-Block Symmetry Riddles
- **Extra Practice:** Symmetric Designs
- For additional practice with symmetry concepts, students use dot paper to create half of a design which a partner will then finish based on an understanding of line symmetry. GMP7.2
- **Activity Card: 63**
- **ELL Support:** To scaffold students' understanding of terms used in the lesson, including *line, fold, horizontal, vertical,* and *mirror image,* provide vocabulary cards for each term with corresponding illustrations. Use Total Physical Response prompts to model each term, directing students to find classroom examples that help illustrate each of these terms. For example, point to a vertical line as you say the term, and then ask students to point to another vertical line.

Lesson 5-13 More Multistep Multiplication Number Stories

Standards: 4.NBT.3 , 4.NBT.4 , 4.NBT.5, 4.OA.3
Warm Up/Mental Math: Students write decimals using base-10 numerals**.**

Focus: Math Message - Students solve a number story. Look at the information in the top table on journal page 188. Be sure to note that the cost per hour is for each performer in the group. How much more would it cost to hire the tap dancers than the jugglers? $216

Practice: Students express solution strategies with appropriate units and number models.

- **Games:** Students practice subtracting fractions by playing *Fishing for Fractions*, in which they "fish" for a fraction card with a like denominator and then subtract a smaller fraction from a larger one. Students record equations representing some of their fraction subtraction problems on *Math Masters,* page G37.
    - Observe: Which students ask for fractions with like denominators? Which students are able to accurately subtract fractions? GMP6.4
    - Discuss: What mistakes did you or your group make when subtracting fractions? How can manipulatives help you with this game?
- **Math Boxes:** *Math Journal 2* pages 187–189
- **Home Link** 5-13

Assessment: Students solve number stories and write number models with variables for unknowns. Observe students working on Problems 1 and 2 on journal pages 188–189. Expect them to solve the problems correctly and express their solution methods as single number models with a letter for the unknown. GMP4.1 For students who struggle, suggest writing each step they would use to solve the problem. Then have them decide how to organize those steps into a single number model, using parentheses as needed.

Differentiation Options:

- **Readiness:** Solving Multistep Number Stories
- **Enrichment**: Writing Multistep Multiplication Number Stories
- **Extra Practice:** Planning a Trip to Thrill City
- **Activity Card:** 64
- **ELL Support:** To help students focus on the mathematical content of the lesson, rather than vocabulary, accompany oral and written explanations with visual aids dealing with the vocabulary and contexts of the number stories; for example, jugglers and tumblers. Maintain a display of words with pictures of the different entertainment and food options for students to reference when reading number stories.

Lesson 5-14 Assessment (2-day Lesson)
Warm Up & Self-Assessment: Students complete the Self-Assessment. **Unit 5 Assessment:** These items reflect mastery expectations to this point **Unit 5 Challenge (Optional):** Students may demonstrate progress beyond expectations **Solving the Open Response Problem:** ● **Discussing the Problem:** The class discusses students' explanations **Look Ahead:** ● **Math Boxes** 5-14: Preview for Unit 6 ● **Home Link** 5-14: Students take home the Family Letter that introduces Unit 6 **Differentiation Options:** See TE for adjustments to the assessment

Student Resources	
Print	Student Math Journal Volume 2
Print	Student Reference Book
Print/Online	Activity Cards
Print/Online	EM Games Online

Teacher Resources	
Print	Teacher's Lesson Guide Volume 2
Print/Online	Spiral Tracker
Print/Online	Math Masters
Print/Online	Assessment Handbook
Online	eToolkit
Online	ePresentations
Literature Link	**Queen Arlene's Dilemma**
Online	https://learnzillion.com
Online	www.mathgoodies.com
Online	www.commoncoreconversation.com
Online	https://grade4commoncoremath.wikispaces.hcpss.org/

Unit Plan Title	Division; Angles
Suggested Time Frame	20 days including flex/game days

Stage 1: Identify Desired Results

Overview / Rationale

In this unit, students explore the relationship between multiplication and division by developing a method for dividing whole numbers and solving division number stories. They are introduced to protractors and explore using them to measure and construct angles. Student learning will focus on four clusters of the NJ Student Learning Standards for Math (NJSLS-M), Operations and Algebraic Thinking, Number and Operations in Base Ten, Numbers and Operations with Fractions, and Measurement and Data.

Standards

4.OA.1 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.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.3c Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. Add and subtract mixed numbers with like denominators.

4.NF.3d Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. 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.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.

Technology Integration
__X__ **8.1 Educational Technology:** All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
- Student Websites - Teacher Websites - SMART board
____**8.2 Technology Integration, Engineering, Design and Computational Thinking – Programming** All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

INTEGRATED SOCIAL AND EMOTIONAL LEARNING COMPETENCIES
The following social and emotional competencies are integrated in this curriculum document:

Self-Awareness
_____Recognize one's own feelings and thoughts
_____Recognize the impact of one's feelings and thoughts on one's own behavior
_____Recognize one's personal traits, strengths and limitations
_____Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management
__x__Understand and practice strategies for managing one's own emotions, thoughts and behaviors
__x__Recognize the skills needed to establish and achieve personal and educational goals
__x__Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness
__x__Recognize and identify the thoughts, feelings, and perspectives of others
_____Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
_____Demonstrate an understanding of the need for mutual respect when viewpoints differ
_____Demonstrate an awareness of the expectations for social interactions in a variety of setting

Responsible Decision Making
__x__Develop, implement and model effective problem solving and critical thinking skills
_____Identify the consequences associated with one's action in order to make constructive choices
_____Evaluate personal, ethical, safety and civic impact of decisions

Relationship Skills
_____Establish and maintain healthy relationships
__x__Utilize positive communication and social skills to interact effectively with others
_____Identify ways to resist inappropriate social pressure
_____Demonstrate the ability to present and resolve interpersonal conflicts in constructive ways
_____Identify who, when, where, or how to seek help for oneself or others when needed

In this unit plan, the following 21st Century Life and Careers skills are addressed:				
Check ALL that apply – **21st Century Themes**			**Indicate whether these skills are:** ● **E – encouraged** ● **T – taught** ● **A – assessed** **Career Ready Practices**	
9.1	**Personal Financial Literacy**		E	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		TA	CRP2. Apply appropriate academic and technical skills.
	Money Management			CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management		ETA	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing			CRP5. Consider the environmental, social and economic impacts of decisions.
X	Becoming a Critical Consumer			CRP6. Demonstrate creativity and innovation.
X	Civic Financial Responsibility			CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		ETA	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	**Career Awareness, Exploration, and Preparation**			CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		E	CRP11. Use technology to enhance productivity.
	Career Preparation			CRP12. Work productively in teams while using cultural global competence.

Interdisciplinary Connections

Other standards covered:

RI.4.3 - Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

RI.4.4 - Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a *grade 4 topic or subject area*.

RI.4.7 - 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.

SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly

Essential Questions:	Enduring Understandings:
● How can multiples be used to solve problems? ● How can I use what I know about repeated subtraction, equal sharing, and forming equal groups to solve division problems? ● How does my knowledge about multiplication facts help me to solve problems?	***Students will understand that…*** ● Students will use the relationship between multiplication and division to solve problems. ● Students will practice the idea of the equal groups, and then model to solve division problems.
Knowledge:	**Skills:**
Students will know… ● Students find a rule for solving extended division facts. ● Students find missing side lengths of rectangles. ● Students solve division number stories using familiar multiples. ● Students explore dividing multi-digit numbers into parts as a method for division. ● Students interpret remainders to decide how to package fruit for a fundraiser and explain their solutions. ● Students discuss solutions and explanations of the problem and revise their work. ● Students explore U.S. customary units of weight and convert tons to pounds and pounds to ounces. ● Students practice using partial-quotients division to divide whole numbers with 3- and 4-digit dividends ● Students explore different ways to express and interpret remainders ● Students make an angle measurer and use it to measure angles. ● Students add and subtract fractions and mixed numbers with like denominators to solve number stories.	**Students will be able to…** ● Solve and articulate a plan for solving multistep number stories involving addition, subtraction, and multiplication, and assess the reasonableness of their answers by comparing them to an estimate. ● Accurately multiply a 3-digit number by a 1-digit number and 2-digit numbers by a multiple of 10 and illustrate and explain multiplication by a 1-digit number. ● Accurately divide a 2-digit number by a 1-digit number and illustrate and explain division of a 2-digit number by a 1-digit number. ● Add and subtract mixed numbers using manipulatives and visual fraction models. ● Add and subtract fractions in number stories using manipulatives and visual fraction models. ● Correctly identify the type of angle and obtain measurements within the correct range: less than 90 degrees for an acute angle, and greater than 90 degrees for an obtuse angle. ● Recognize angle measures as additive within benchmark angles measuring 90 and 180 degrees, and add and subtract to find unknown angle measures within benchmark angles measuring 90 and 180 degrees. ● Measure angles with a half-circle protractor. ● Add and subtract to find unknown angle measures

● Students use their understanding of whole-number multiplication to multiply fractions by whole numbers.	

Stage 2: Acceptable Evidence

Assessments	
Formative: ● Assessment Check In ● Mental Math and Fluency ● Exit Slips/Slate Assessments ● Informal ● Observations ● Math Journal ● Home Links ● EDM Games ● Self Assessment ● Questioning	**Summative:** ● Beginning of the Year Assessment ● Unit Progress Check ● Open Response ● Quizzes ● Tests ● Student Work Products

Stage 3: Learning Experience

Lesson 6-1 Extended Division Facts

Standards: 4.NBT.1, 4.NBT.5, 4.NBT.6

Warm Up/Mental Math: Students solve multiplication fact extensions.

Focus: Math Message - Students solve an extended-division-fact number story. The principal is ordering snack-size bags of pretzels. Nine cartons contain 540 bags. How many bags come in a carton? 60 Write an equation with a letter for the unknown to show your work. GMP4.1

Practice:

- **Relating Multiplication and Division -** Students explore the connections between multiplication and division in extended fact families.
- **Finding Patterns in Extended Division Facts -** Students find patterns in solutions to extended division facts.
- **Games: Playing *Fishing for Fractions*** (Mixed-Number Addition)
- **Math Boxes:** Math Journal 2 pages 191–192
- **Home Link:** 6-1

Assessment: Playing *Divide and Conquer* to practice extended division facts.
Observe students. Expect students acting as the Brain to correctly find extended division facts with 1-digit divisors and 1 or 2 zeros attached to the dividend. For students who struggle, have the Caller first announce the basic division fact for the Brain to answer. Then have the Caller announce the extended fact and have the Brain use the answer to the basic fact to solve. For students who excel, challenge them to play the game with 3 or more zeros attached to the dividend.

Differentiation Options:

- **Readiness:** Emphasizing the Division/Multiplication Connection for Extended Facts
- **Enrichment:** Sorting a Bag of Numbers
- **Extra Practice:** More Extended Facts Practice
- **Activity Cards:** 65
- **ELL Support:** Use concrete objects such as an extension cord or antenna to teach the terms *extend* and *extension*. Demonstrate extending objects as you make think-aloud statements that include defining contexts, such as: *I cannot reach the outlet so I will use an extension cord with a greater length. I will extend the antenna to make its length greater, or longer.* Make the connection to an extended fact such as $20 * 3 = 60$ and say, *$20 * 3 = 60$ is an extended fact for $2 * 3 = 6$; 20 is a greater amount than 2, and 60 is a greater amount than 6.*

Lesson 6-2 Area: Finding Missing Side Lengths

Standards: 4.MD.3, 4.NBT.4, 4.NBT.5, 4.NBT.6

Warm Up/Mental Math: Students convert between fraction and decimal notation

Focus: Math Message - Students find the unknown length of a side of a rectangle. *A rectangular garden has an area of 450 square feet. One side is 9 feet long.* How long is the other side? 50 feet

Practice: Finding the Missing Side Length

- **Solving Area Problems with Missing Side Lengths -** Students use division to find unknown side lengths**.**
- **Games:** Students play ***Rugs and Fences*** (Variation) to identify unknown side lengths of rectangles.
- **Math Boxes:** *Math Journal 2* pages 193–194
- **Home Link:** 6-2

Assessment: Students use division to find unknown side lengths.

Expect that most students can complete Problems 1 and 2 on journal page 193, since a diagram is given. Watch for students having difficulty, and assess whether this is because of a lack of fact fluency or a lack of understanding about how to find the length of the unknown side, given one side and the area. To scaffold, invite students to use fact tables or a calculator if they are unable to solve because of a lack of fact fluency.

Differentiation Options:

- **Readiness:** Finding Unknown Factors
- **Enrichment:** A Question about Rectangles
- **Extra Practice:** Finding Garden Plot Dimensions
- **Activity Cards:** 66
- **ELL Support:** Use visual aids and think-alouds to help students understand the word *missing*. Show short number sequences with a missing number, such as: 1, 2, 3, ___ , 5, 6. Ask: What number is missing? What number is not here? Use think-aloud statements like these: *The ___ is not there. The ___ is missing*. Have students repeat the statements. Repeat with other number sequences or collections of objects.

Lesson 6-3 Strategies for Division

Standards: 4.NBT.6, 4.OA.4

Warm Up/Mental Math: Students use division and multiplication to find unknown quantities in multiplicative comparison number stories.

Focus: Math Message - Students solve a division number story. *Mariana is in charge of seating students for an assembly. Each table seats 6. Seventy-eight students will attend the assembly.* How many tables will she need to seat all of the students? 13 tables

Practice: Using Multiples to Solve Division Problems

- **Practicing Division Strategies -** Students practice solving division problems using multiples**.**
- **Games:** Students play ***Fishing for Fractions*** (Mixed-Number Subtraction) to practice subtracting mixed numbers.
- **Math Boxes:** *Math Journal 2* pages 195–197
- **Home Link:** 6-3

Assessment: Students practice solving division problems using multiples.

Observe students working on journal page 195. Expect them to solve Problems 1–2 correctly, using lists of multiples as needed. Some may be able to solve the problems without lists. For students who struggle, suggest making a concrete model of the problem using groups of cubes. They may use the cubes both to fill in the list of multiples and to visualize the answer. Have students who solve the problems with ease write two number stories, similar to the ones shared during the instructional time, for their partners to solve.

Differentiation Options:

- **Readiness:** Playing *Buzz* and *Bizz-Buzz*
- **Enrichment:** Finding Factor Pairs for 2,340
- **Extra Practice:** Dividing 97 into Groups
- **Activity Cards:** 67
- **ELL Support:** Scaffold student understanding of vocabulary terms by preparing an anchor chart titled “Division” showing a problem with the *dividend*, *divisor,* and *quotient* clearly labeled. Display number sentences using the traditional long division symbol, the division sign (÷), and fraction forms with both horizontal (–) and diagonal (/) bars . Provide oral practice with the terms *divide, divisor, dividend,* and *quotient* by having students chorally and individually repeat the terms as you show the words and point to examples.

Lesson 6-4 Partial-Quotients Division, Part 1

Standards: 4.MD.3, 4.MD.3, 4.NBT.4, 4.NBT.5, 4.NBT.5

Warm Up/Mental Math: Students compare fractions using >, <, or =.

Focus: Math Message - Students solve a division number story. *The art club is making a rectangular mural for the gym wall. They have 98 square-foot tiles. If the club members want the mural to be 7 feet long,* how tall will it be? 14 feet *Be prepared to explain how you know.*

Practice: Introducing Dividing by Parts - Students partition a rectangle to solve a division problem with a 2-digit dividend**.**

- **Introducing Partial-Quotients Division -** Students divide by parts using a model to understand partial quotients as a written representation.
- **Math Boxes:** *Math Journal 2* pages 198–200
- **Home Link:** 6-4

Assessment: Students estimate quotients and solve division problems involving 2-digit dividends using partial quotients. Expect most students to attempt to use multiples when completing journal page 198. For students who struggle, suggest that they use *Math Masters*, page TA49 to list multiples for the problem before solving it. For students who excel, encourage them to check their work by partitioning a rectangle.

Differentiation Options:

- **Readiness:** Playing *Beat the Calculator*
- **Enrichment:** Solving a Ring Riddle
- **Extra Practice:** Playing *Division Top-It*
- **Activity Cards:** 68
- **ELL Support:** Build background knowledge for understanding the meaning of *partial*, as a part of a larger whole, by using jigsaw puzzle pieces to demonstrate the meaning of *part* and *partial*. Show a puzzle piece, saying: *This is a part of the puzzle*. Show several pieces, saying: *These are parts of the puzzle*. Assemble them and say, "*This is a partially completed puzzle*. Display the words and emphasize how *part* is embedded in *partial*. Provide practice with the terms using Total Physical Response commands like these: *Show me one part. Count the parts. Use the parts to make the whole. Show me a whole puzzle. Point to part of a puzzle*."

Lesson 6-5 Open Response Fruit Baskets (Day 1)

Standards: 4.NBT.6, 4.OA.3

Warm Up/Mental Math: Students compare decimals using >, <, and =.

Focus: Math Message - Students solve a division problem about packaging eggs and interpret the remainder. *Complete journal page 201. Then discuss your answers with a partner*

Practice: Elbert's Eggs Follow-Up - Students share their solutions and discuss the maximum and minimum number of leftover eggs possible.

- **Solving the Open Response Problem -** Students solve multistep problems about distributing oranges into baskets and putting baskets into boxes. They use division and interpret remainders in two different ways. Review students' work and plan discussion for reengagement.
- **Math Boxes:** *Math Journal 2* page 201

Differentiation Options: In Open Response and Reengagement Lessons, differentiation is integral to the reengagement process, so separate Readiness, Extra Practice, and Enrichment activities are not provided.

Lesson 6-5 Open Response Fruit Baskets (Day 2)

Warm Up/Mental Math: Setting Expectations - Students review the open response problem and discuss what constitutes clear use of units, labels, and mathematical language. Reengaging in the Problem. Students analyze others' work, looking carefully at the use of units, labels, and language that other students use in their explanations.

Focus: Math Message: Students revise their work from Day 1.

Practice: Math Boxes - *Math Journal 2* page 202

Assessment: Students revise their work from Day 1 - Collect and review students' revised work. Expect students to improve their work based on the class discussion. For the content standards, expect most students to **find** that 17 baskets are needed in Problem 1 (15 baskets filled with 5 oranges and 2 baskets filled with 6 oranges) and 3 boxes are needed in Problem 2. (The correct answers are evidence that the student divided correctly and interpreted the remainders.) You can use the rubric below to evaluate students' revised work for GMP6.3.

Differentiation Options: In Open Response and Reengagement Lessons, differentiation is integral to the reengagement process, so separate Readiness, Extra Practice, and Enrichment activities are not provided.

Lesson 6-6 Customary Units of Weight

Standards: 4.NBT.5

Warm Up/Mental Math: Students solve multiplicative comparison problems.

Focus: Math Message - Students estimate the weights of objects. Display the measurement scales on journal page 204, along with the scales you have collected that measure ounces and pounds. Ask: Would a stapler weigh about 7 ounces or 7 pounds? 7 ounces Might a car weigh about 1 ton or 2,000 pounds? Either; they are the same. Be prepared to explain your answers.

Practice: Measuring Weight in U.S. Customary Units - Students use measurement scales to answer questions.

- **Solving U.S. Customary Weight Number Stories -** Students solve number stories involving weight.
- **Converting Tons, Pounds, and Ounces -** Students convert U.S. customary measures of weight.
- **Games:** Students play ***Fraction Top-It*** to compare fractions. GMP3.1 See Lesson 3-11 for details.
- **Math Boxes:** *Math Journal 2* pages 203–205
- **Home Link:** 6-6

Assessment: Students convert U.S. customary measures of weight.
Observe students solving Problems 1–4 on journal page 204. Expect them to be able to convert tons to pounds and pounds to ounces when given the relationships 1 T = 2,000 lb and 1 lb = 16 oz. Expect some to be able to explain that they multiplied the number of tons by 2,000 to find the number of pounds and multiplied the number of pounds by 16 to find the number of ounces. For students who struggle, walk through using a measurement scale to convert.

Differentiation Options:

- **Readiness:** Ordering Weights
- **Enrichment:** Converting Units of Weight
- **Extra Practice:** Converting Weights
- **Activity Cards:** N/A
- **ELL Support:** English language learners may confuse the homophones *wait* and *weight*. Show images of familiar situations in which people have to *wait*, such as waiting in line or in a waiting room. Make a vocabulary card and point to the pictures, saying: *They have to wait. They are waiting their turn*. Make another card showing images of scales in use. Say: *Scales are used to measure the weight of people and objects*.

Lesson 6-7 Partial-Quotients Division, Part 2

Standards: 4.NBT.2, 4.NBT.3, 4.NBT.6, 4.OA.4

Warm Up/Mental Math: Students solve extended multiplication facts.

Focus: Math Message: Students solve a division number story. Lillian needs to buy 112 bottles of water for the school party. The bottles come in packs of 4. How many packs should she buy? 28 packs Be prepared to explain how you know.

Practice: Solving a Division Problem - Students discuss methods for solving a division problem.

- **Exploring Partial Quotients with 3- and 4-Digit Dividends -** Students extend the partial-quotients algorithm.
- **Using Partial-Quotients Division** to solve problems with 3- and 4-digit dividends.
- **Games:** Students play the ***Fraction Match*** Game to practice identifying equivalent fractions. GMP6.1 See Lesson 3–9 for more information. To extend this game, have players match only equivalent fractions.
    - Observe: Which students appear to use a strategy when comparing fractions? Which students are engaged in the game?
    - Discuss: Select two cards from the deck. How can you use the multiplication rule to find an equivalent fraction? What strategy did you use when comparing fractions and trying to make a match?
- **Math Boxes:** *Math Journal 2* pages 206–208
- **Home Link:** 6-7

Assessment: Students use partial-quotients division to solve problems with 3- and 4-digit dividends. - Observe students as they complete journal pages 206–207. Expect students to attempt to use partial-quotients division to solve Problems 1 and 2. For those who find it difficult, provide *Math Masters*, page TA49, which focuses on easy multiples. For students who excel on these journal pages, have them try division problems with a 2-digit divisor and explain their process.

Differentiation Options:

- **Readiness:** Playing *Divide and Conquer*
- **Enrichment:** Performing a Math Trick
- **Extra Practice:** Playing *Division Top-It* (Advanced Version)
- **Activity Cards:** 69
- **ELL Support:** Display models (such as toy shoes, toy hats, or small items from a board game) and corresponding real-life objects. Explain that a model is sometimes used to represent a real object. Show a real-life object and say: *Pick up the model of the* _____. To help students make the connection to an area model of division, model dividends using base-10 blocks to cover the area of a rectangle.

Lesson 6-8 Expressing and Interpreting Remainders

Standards: 4.NBT.6, 4.OA.3

Warm Up/Mental Math: Students decide whether pairs of fractions are equivalent.

Focus: Math Message: Students solve a division number story and decide what to do with the remainder. *Three students share 13 sticks of gum. How many sticks of gum does each student get if they receive equal shares? Be prepared to discuss your strategy.*

Practice: Expressing Remainders as Fractions - Students rewrite remainders as fractions.

- **Interpreting Remainders in Context -** Students consider multiple ways to interpret remainders.
- **Solving Division Number Stories with Remainders -** Students solve number stories and interpret remainders**.**
- **Games:** ***Growing Patterns*** - Students complete growing patterns of numbers and shapes.
- **Math Boxes:** *Math Journal 2* pages 209–212
- **Home Link:** 6-8

Assessment: Students solve number stories and interpret remainders.

Most students should be able to correctly divide 2-digit by 1-digit numbers in Problems 1 and 4a. Watch for students who struggle doing the division and provide *Math Masters,* page TA49 or model dividing by parts by partitioning a rectangle. For students who excel, have them find out how to check quotients with a remainder using multiplication.

Differentiation Options:

- **Readiness:** Exploring Remainders in Literature
- **Enrichment:** Solving a Sharing Number Story
- **Extra Practice:** Playing *Division Dash*
- **Activity Cards:** 70
- **ELL Support:** Scaffold student understanding of the word remainder in the sense of left over, using think-alouds and real objects. Start with a number of objects that cannot be evenly shared by a small group and say: *We are going to share these _____fairly. One for you, one for you, one for you (and so on), and one for me.* Once sharing is done, point to the leftover objects, saying: *These are left over. They are the remainder.* Have students repeat with a partner or partners, using another set of objects and repeating the sentences used in the think-aloud while pointing to their remainder.

Lesson 6-9 Measuring Angles

Standards: 4.MD.5.a, 4.MD.5.b, 4.MD.6

Warm Up/Mental Math: Students practice turning clockwise and counterclockwise.

Focus: Math Message: Students consider a tool for measuring angles. Display the picture below and pose the following problem: Max measured an angle. He said the angle was 4 centimeters wide. Does his measurement make sense? Be prepared to explain why or why not. GMP5.1

Practice: Making an Angle Measurer

- **Measuring Angles with the Angle Measurer**
- **Games:** Students play the *Angle Race* Game to practice angle measurement skills. They make angles of given measures on circular geoboards or on *Math Masters,* page TA51. Read the directions on *Student Reference Book,* page 249. Model a round for students as you read the directions.
- Observe: Which students are able to correctly model an angle of a given measure? Which students know that an angle measuring 90° is a right angle?
- Discuss: How did knowledge of benchmark angles help you with this game? After the first turn, how did you figure out where to place the second side of the angle?
- **Math Boxes:** *Math Journal 2:* pp. 213–214
- **Home Link :** Home Link 6-9

Assessment: Students use their angle measurers to measure angles.

Expect students to be able to provide the correct measures for angles *B* and *D* on journal page 213. GMP5.2, GMP6.4 Some may be able to accurately measure all of the angles. Watch for students who have difficulty lining up the 0° mark on the measurer with the side of the angle where the arc begins. Have them trace their fingers along the arc that denotes the rotation prior to using the angle measurer. Invite students who express interest to draw and then measure angles.

Differentiation Options:

- **Readiness:** Forming Clockwise and Counterclockwise Rotations
- **Enrichment:** Mystery Shapes
- **Extra Practice:** Degrees of Accuracy
- **Activity Cards:** 71–72
- **ELL Support:** Use visuals and labels to scaffold understanding of geometric language in the lesson, illustrating the following terms: *angle, vertex, right angle, acute angle, straight angle,* and *obtuse angle.* As you say a term and point to the illustration, use Total Physical Response gestures to help students identify the meaning of each term. For example: *Touch the vertex of this angle. Show me the sides of this angle. Draw a right angle.*

Lesson 6-10 Using a Half-Circle Protractor

Standards: 4.G.1, 4.MD.5.a, 4.MD.5.b, 4.MD.6

Warm Up/Mental Math: Students translate between decimal and fraction notation.

Focus: Math Message: Students draw acute, obtuse, and straight angles. Complete the Math Message problems on journal page 215.

Practice: Introducing the Half-Circle Protractor - Students compare the half-circle protractor with angle measurers.

- **Measuring Angles with a Half-Circle Protractor -** Students identify and measure angles
- **Drawing Angles with a Half-Circle Protractor -** Students draw angles of a specified measure.
- **Games:** Student play the ***Division Dash*** game to practice dividing a 2-digit dividend by a 1-digit divisor. GMP7.2 Read through the instructions on *Student Reference Book*, page 256 as you model a few rounds.
    - Observe: Which students' fluency with basic facts facilitates their ability to divide other numbers? Which students are using efficient strategies to find the quotient?
    - Discuss: How did you check your partner's quotients? How could you change the rules of this game so that you could get a higher score?
- **Math Boxes:** *Math Journal 2:* pp. 215–217
- **Home Link:** Home Link 6-10

Assessment: Students identify and measure angles

Expect students to be able to correctly identify the three angles at the bottom of journal page 215 as acute or obtuse. Since this is their first experience using a half-circle protractor, do not expect all students to obtain correct measures. Measurements should, however, be within the correct range: less than 90° for an acute angle and greater than 90° for an obtuse angle. GMP5.2 Watch for students using the wrong measurement scale, not placing the protractor's center over the vertex of the angle, or not aligning one side of the angle with the base line. Assist students in the correct use of the protractor by reviewing these steps.

Differentiation Options:

- **Readiness:** Modeling Angles
- **Enrichment:** Exploring Angles in Literature
- **Extra Practice:** Playing *Angle Tangle*
- **Activity Cards:** N/A
- **ELL Support:** Use visual displays and labels to scaffold students' understanding of the geometric terms used in this lesson. Prepare displays to illustrate the following terms: *half-circle; rotation/turn; clockwise, counterclockwise; base line* and *directional arc*. Say each term and point to the illustration. Then say the term and have students point to the

correct illustration. Use Total Physical Response by having them act out each term with their bodies.

Lesson 6-11 Angle Measures as Additive

Standards: 4.MD.5.b, 4.MD.6, 4.MD.7, 4.NBT.4

Warm Up/Mental Math: Students practice writing decimals.

Focus: Math Message - Students find an unknown angle measure. *Complete* Math Masters, *page 244.*

Practice:

- **Finding Unknown Angle Measures** by writing equations. Have students complete journal page 218. Observe to be sure students are writing equations with a symbol for the unknown angle measures. GMP7.2 When students have completed the page, bring the class together and have volunteers share answers. Discuss how students solved Problem 5. Sample answer: The straight angle is divided into 3 smaller angles. I know that one angle measures 15°, the second angle measures 50°, and the straight angle measures 180°. So I solved 180° – (50° + 15°) = x. The unknown angle measure is 115°**.**
- **Games:** Students play the ***Angle Add-Up*** game to find unknown angle measures. To further explore the idea that angle measures are additive, students draw angles and add and subtract to find the measures of unknown angles. Have students examine the full-circle protractor. Point out that, like the angle measurers in Lesson 6-9, it shows a complete 360-degree rotation, and, like the half-circle protractor, each degree is marked and every 10-degree increment is labeled. Model sketching angles of specified measures on the full-circle protractors from the record sheet as needed. Students use full-circle protractors to verify the results of their equations. GMP6.4 Note that Round 1 requires students to use addition to find the unknown angle measure. Rounds 2 and 3 require subtraction. Before they play the game, tell students that the notation "$m\angle ABC$" shown on the record sheet means "the measure of angle ABC."
    - Observe: Which students are able to add and subtract to find unknown angle measures? Which students know where to set the 0/360° mark when measuring?
    - Discuss: *Why is it helpful to draw an angle with longer rays**?** Does extending each ray change the measure of the angle? Why or why not?*
- Students play the ***How Much More?*** game by solving comparison number stories and recording multiplicative equations. Remind students that in order to write valid multiplicative comparison statements, one amount must be compared to another using multiplication. GMP1.1, GMP2.3 Have students record a few rounds of play on Math Masters, page G21. See Lesson 2-9 for additional information.
- **Math Boxes:** *Math Journal 2* pages 218–219
- **Home Link:** 6-11

Assessment: *Jacob combined an angle measuring 30° and an angle measuring 50°. Ella made an angle measuring 80°. Whose angle was larger? Explain how you know.* Sample answer: Their angles are the same size. An angle measuring 30° and an angle measuring 50° make an angle measuring 80°. Have students write answers on an Exit Slip. For students who struggle, help them use a protractor to draw the angles.

Differentiation Options:

- **Readiness:** Putting Together Angles
- **Enrichment:** Finding the Sum of a Triangle's
- **Extra Practice:** Combining Angles
- **Activity Cards:** 73
- **ELL Support:** Introduce the terms *remaining* and *unknown*, as you discuss the attributes of supplementary angles. Using a diagram such as in the Focus activity: Finding Unknown Angle Measures, point to and shade in the angle whose measure is given, and say: *We know that this angle measures 30°. What's left? What's remaining? What's unknown? What don't we know? Do we know the measure of this ang*

Lesson 6-12 Number Stories with Fractions and Mixed Numbers

Standards: 4.MD.1, 4.MD.2, 4.NF.3.a, 4.NF.3.b, 4.NF.3.c, 4.NF.3.d

Warm Up/Mental Math: Students compare decimals using >, <, and =.

Focus: Math Message: Students find the difference between two mixed numbers.

Liam is choosing between two school backpacks. The black one weighs 15/8 pounds. The blue one weighs 21/8 pounds. Which one weighs more? How much more? *Write a number model with an unknown to represent the problem. Then solve.* 21/8 – 15/8 = *x*, or 15/8 + *x* = 21/8; Blue weighs 48 pound more than black.

Practice: Adding and Subtracting Fractions and Mixed Numbers .

- **Solving Number Stories with Fractions and Mixed Numbers**
- **Games:** Students play the ***Fraction Match*** game to practice recognizing equivalent fractions. When they have finished playing the game, have them complete the record sheet. Students select two fractions that match and use a model to explain how they know the fractions are equivalent. GMP6.1 See Lesson 3-9 for more details.
    - Observe: Which students appear to use a strategy when comparing fractions? Which students can model the fractions to show their equivalency?
    - Discuss: *Select two cards from the deck*. How can you use the multiplication rule to find an equivalent fraction? What strategy did you use when comparing fractions and trying to make a match?
- **Math Boxes:** *Math Journal 2:* pp. 220–222
- **Home Link:** Home Link 6-12

Assessment: Students solve fraction and mixed number problems.

Observe as students work together on journal pages 220–221. Expect that most students can solve Problems 1–5, using a tool if needed. GMP4.1 Watch for students who have difficulty figuring out what the problem is asking for and for students who are making computation errors. Encourage them to model the problem.

Differentiation Options:

- **Readiness:** Decomposing a Mixed Number
- **Enrichment:** Solving Number Stories with Unlike Denominators
- **Extra Practice:** Solving Fish Number Stories
- **Activity Cards:** N/A
- **ELL Support:** Scaffold understanding of the term *decompose* by using the term *take apart*. Show items that can be taken apart and easily put back together, such as a simple puzzle. Demonstrate putting the puzzle together and then taking it apart, using think-alouds like these: *I put this puzzle together. Now I am going to take it apart. I can put it back together and take it apart again*.

Lesson 6-13 Extending Understandings of Whole-Number Multiplication

Standards: 4.NBT.5, 4.NF.4.b, 4.NF.4.c

Warm Up/Mental Math: Students add and subtract fractions.

Focus: Math Message - Students represent a multiplication number story using a picture and an equation. *Draw a picture and write an equation on your slate to represent the following number story: There are 3 vases. Each vase has 4 flowers in it. How many flowers are there in all?* Sample answers: $3 * 4 = 12$; $4 + 4 + 4 = 1$

Practice: Students use whole number addition and multiplication understandings to multiply a fraction by a whole number.

- **Games:** Students play the ***Decimal Top-It*** game making the largest possible 2-digit decimal numbers and then compare with their partners. GMP7.2
    - Observe: What strategies are students using to create the largest decimal? Which students are able to read the number out loud?
    - Discuss: How did you use your model to help you? What strategy did you use to try to create the largest decimal?
- **Math Boxes:** *Math Journal 2:* pp. 223–225
- **Home Link:** Home Link 6-13

Assessment: Students solve number stories involving multiplication of a fraction by a whole number. Expect most students to be able to identify the number of groups and number of objects in each group, and represent each problem on journal pages 224–225 using addition or multiplication equations. GMP4.1 This demonstrates their ability to apply and extend understandings of multiplication to multiply a fraction by a whole number. For students who struggle, have them complete a multiplication/division diagram to identify the number of groups and number of objects in each group.

Differentiation Options:

- **Readiness:** Solving Equal-Groups Number Stories
- **Enrichment: S**olving Missing-Groups Number Stories
- **Extra Practice:** Multiplying a Fraction by a Whole Number
- **Activity Cards:** N/A
- **ELL Support:** Scaffold students' understanding of the term *represent* by interchangeably using the everyday terms *show* or *stand for*, and translating from concrete objects to pictorial and symbolic representations. For example, use base-10 blocks to create a concrete representation of a number and show the blocks along with a pictorial representation of base-10 shorthand symbols. Then represent them with numbers or arithmetic expressions. Say: *I can represent these base-10 blocks using pictures or symbols. I can show them using pictures or symbols.*

Lesson 6-14 (2-day lesson)
Self-Assessment: Have students complete the Self-Assessment. **Assess:** ● **Unit 6 Assessment** - These items reflect mastery expectations to this point ● **Unit 6 Challenge (Optional)** - Students may demonstrate progress beyond expectations ● **Solving the Open Response Problem** ● **Discussing the Problem:** The class discusses students' explanations **Look Ahead:** **Math Boxes 6-14**: Preview for Unit 7 **Home Link 6-14 -** Students take home the Family Letter that introduces Unit 7 **Differentiation Options:** See TE for adjustments to the assessment

Student Resources	
Print	Student Math Journal Volume 2
Print	Student Reference Book
Print/Online	Activity Cards
Print/Online	EM Games Online

Teacher Resources	
Print	Teacher's Lesson Guide Volume 2
Print/Online	Spiral Tracker
Print/Online	Math Masters
Print/Online	Assessment Handbook
Online	eToolkit
Literature Link	*A Remainder of One by* Elinor J. Pinczes (optional)
Literature Link	*Sir Cumference and the Great Knight of Angleland* by Cindy Neuschwander (optional)
Online	https://learnzillion.com
Online	www.mathgoodies.com
Online	www.commoncoreconversation.com
	https://grade4commoncoremath.wikispaces.hcpss.org/

Online	

Unit Plan Title	Multiplication of a Fraction by a Whole Number; Measurement
Suggested Time Frame	19 days including flex/game days

Stage 1: Desired Results

Overview / Rationale

In this unit, students formalize their understanding of multiplying a fraction by a whole number and use this knowledge to solve problems in real-world scenarios. Student learning will focus on four clusters of the NJ Student Learning Standards for Math (NJSLS-M), Operations and Algebraic Thinking, Number and Operations in Base Ten, Numbers and Operations with Fractions, and Measurement and Data.

Standards

4.OA.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.

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.4a Understand a fraction *a*/*b* as a multiple of 1/*b. For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).*

4.NF.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. *For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)*

4.NF.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.MD.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb., oz.; l, ml; hr., min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *For example, know that 1 ft. is 12 times as long as 1 in. Express the length of a 4 ft. snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), . . .*

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.*

Technology Integration
__X__ **8.1 Educational Technology:** All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
- Student Websites - Teacher Websites - SMART board
____ **8.2 Technology Integration, Engineering, Design and Computational Thinking – Programming** All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

INTEGRATED SOCIAL AND EMOTIONAL LEARNING COMPETENCIES
The following social and emotional competencies are integrated in this curriculum document:

Self-Awareness
_____Recognize one's own feelings and thoughts
_____Recognize the impact of one's feelings and thoughts on one's own behavior
_____Recognize one's personal traits, strengths and limitations
_____Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management
__x__Understand and practice strategies for managing one's own emotions, thoughts and behaviors
__x__Recognize the skills needed to establish and achieve personal and educational goals
__x__Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness
__x__Recognize and identify the thoughts, feelings, and perspectives of others
_____Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
_____Demonstrate an understanding of the need for mutual respect when viewpoints differ
_____Demonstrate an awareness of the expectations for social interactions in a variety of setting

Responsible Decision Making
__x__Develop, implement and model effective problem solving and critical thinking skills
_____Identify the consequences associated with one's action in order to make constructive choices
_____Evaluate personal, ethical, safety and civic impact of decisions

Relationship Skills
_____Establish and maintain healthy relationships
__x__Utilize positive communication and social skills to interact effectively with others
_____Identify ways to resist inappropriate social pressure
_____Demonstrate the ability to present and resolve interpersonal conflicts in constructive ways
_____Identify who, when, where, or how to seek help for oneself or others when needed

In this unit plan, the following 21st Century Life and Careers skills are addressed:				
Check ALL that apply – **21st Century Themes**			**Indicate whether these skills are:** ● **E – encouraged** ● **T – taught** ● **A – assessed** **Career Ready Practices**	
9.1	**Personal Financial Literacy**		E	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		TA	CRP2. Apply appropriate academic and technical skills.
	Money Management			CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management		ETA	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing			CRP5. Consider the environmental, social and economic impacts of decisions.
X	Becoming a Critical Consumer			CRP6. Demonstrate creativity and innovation.
X	Civic Financial Responsibility			CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		ETA	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	**Career Awareness, Exploration, and Preparation**			CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		E	CRP11. Use technology to enhance productivity.
	Career Preparation			CRP12. Work productively in teams while using cultural global competence.

Interdisciplinary Connections

Other standards covered:

RI.4.3 - Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

RI.4.4 - Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a *grade 4 topic or subject area*.

RI.4.7 - 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.

SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly

Essential Questions:	Enduring Understandings:
● How is multiplying whole numbers like multiplying fractions? How is it different? ● How does what I measure influence how we measure?	***Students will understand that…*** ● Students can apply understanding of operations of whole numbers to develop conceptual understanding of multiplying a fraction by a whole number. ● Standard units of measure enable people to interpret results or data.
Knowledge:	**Skills:**
Students will know… ● Students convert between cups, pints, quarts, and gallons. ● Students multiply unit and non-unit fractions by whole numbers. ● Students learn to represent fractions as multiples of a unit fraction. ● Students explore multiplying fractions by whole numbers. ● Students multiply mixed numbers by whole numbers. ● Students discuss how others used tools to solve the recipe problem and revise their work. ● Students use division strategies to solve various measurement problems. ● Students generate and analyze patterns in rectangular numbers. ● Students solve multistep number stories involving fractions. ● Students multiply and add fractional weights to solve problems about state birds. ● Students practice converting between fractions and decimals to solve number stories. ● Students record data on a line plot and answer questions regarding the data.	**Students will be able to…** ● Continue and describe number patterns. ● Apply their understanding of multiplying a 3-digit number by a 1-digit number and 2-digit numbers by a multiple of 10 to multiply a 4-digit number by a 1-digit number and a 2-digit number by a 2-digit number and attempt to illustrate and explain multiplication by a 1-digit number and a 2-digit number by a 2-digit number. ● Accurately divide a 3-digit number by a 1-digit number and illustrate and explain division of a 3-digit number by a 1-digit number. ● Find a multiple of 1/b ● Use multiple strategies, e.g., number lines, manipulatives, and drawings, to multiply a fraction by a whole number. ● Write a multiplication equation with a letter standing for the unknown to represent a number story involving multiplication of a fraction by a whole number. ● Express conversions of units of capacity in a 2-column table. ● Organize and represent data in ⅛ units on line plots and solve addition and subtraction problems about line plot data in ⅛ units.

Stage 2: Acceptable Evidence

Assessments	
Formative: ● Assessment Check In ● Mental Math and Fluency ● Exit Slips/Slate Assessments ● Informal Observations ● Math Journal ● Home Links ● EDM Games ● Self Assessment ● Questioning	**Summative:** ● Beginning of the Year Assessment ● Unit Progress Check ● Open Response ● Quizzes ● Tests ● Student Work Products

Stage 3: Learning Experiences

Lesson 7-1 Converting Liquid Measures: U.S. Customary Units

Standards: 4.MD.1, 4.MD.2, 4.NBT.4, 4.NBT.5, 4.NBT.6

Warm Up/Mental Math: Students add fractions with denominators of 10 and 100.

Focus: Math Message - Students complete a measurement chart. *Complete the Math Message at the top of journal page 228.*

Practice: Students explore relationships between cups, pints, quarts, and gallons. Students use visuals to solve liquid measurement problems and to convert measurement units. Students solve number stories involving conversions.

- **Games: N/A**
- **Math Boxes:** *Math Journal 2* pages 228–230
- **Home Link:** 7-1

Assessment: Students solve number stories involving conversions.
Observe students working on Problems 6 and 7 on journal page 229. Expect them to be able to convert accurately between units of capacity when given the relationships between the units. Expect some to be able to explain how they converted between units using multiplication. For students who struggle, refer them to the diagram or scales at the top of the journal pages and help them find the relationship between the units in the problem. For students who excel, provide additional problems in which they convert from gallons to pints and quarts to cups.

Differentiation Options:

- **Readiness:** Making a Liquid Volume Figure
  Enrichment: Shopping for Milk
- **Extra Practice:** Converting Liquid Measurements
- **Activity Cards:** 74
- **ELL Support:** Use visual aids to build students' familiarity with U.S. customary units. Preview the terms *cup, pint, quart,* and *gallon* by displaying common items with those capacities. Line them up to show their relationships to each other. As you display the visuals, point to and carefully pronounce each unit, paying attention to the consonant cluster at the end of *pint*. Ask students to point to the *cup, pint, quart,* and *gallon*.

Lesson 7-2 Exploring Fraction Multiplication Situations

Standards: 4.MD.1, 4.MD.2, 4.NF.2

Warm Up/Mental Math: Students decompose fractions in two different ways.

Focus: Math Message: Students solve a fraction number story. *The social studies club wants to make papier-mâché globes. To make the paste, each club member will mix 3/4 cup white glue with 1/4 cup water. The club has 9 members. They have 1 quart of water.* Is there enough water for everyone? Yes. 21/4 cups are needed. There are 4 cups in a quart.

Practice: Students multiply unit fractions by whole numbers. Students multiply non-unit fractions by whole numbers. Students solve number stories involving multiplication of a fraction by a whole number.

- **Games:** Students will play the ***Fishing for Fractions*** (Subtraction) game practice subtracting fractions. GMP6.4 See Lesson 5-13 for additional information.
  - Observe: Which students are able to accurately subtract fractions? Which students no longer require manipulatives to play this game?
  - Discuss: What strategies did you use to solve the problems? How can using models of the problems be helpful?
- **Math Boxes:** *Math Journal 2* pages 231–233
- **Home Link:** 7-2

Assessment: Students solve number stories involving multiplication of a fraction by a whole number. Most students should be able to use one of the strategies to multiply a unit fraction by a whole number in Problems 1b–1c on journal page 232. Watch for students who multiply both the numerator and denominator by the whole number. Suggest that they model the problems with fraction circles and use repeated addition to solve.

Differentiation Options:

- **Readiness:** Using Measuring Cups and Spoons
- **Enrichment:** Cooking for One
- **Extra Practice:** Increasing a Recipe
- **Activity Cards:** 75–76
- **ELL Support:** To help students understand the vocabulary and contexts of the number stories in this lesson, accompany the oral and written accounts with a variety of visual aids. In addition, provide a pictorial dictionary source or maintain a display of words with pictures for students' reference when reading number stories; for example, *papier-mâché* globes, glue, muffins, and the various ingredients listed in the recipe.

Lesson 7-3 A Fraction as a Multiple of a Unit Fraction

Standards: 4.NF.4.a , 4.NF.4.b , 4.NF.4.c

Warm Up/Mental Math: Students compare fractions using symbols.

Focus: Math Message - Students represent the relationship between 1/3 and a whole using fraction circles. Jen used /13 cup of skim milk to make a strawberry smoothie. Choose a fraction circle piece to represent how much milk Jen used. If the piece you chose represents 1/3, what piece is the whole? GMP2.1 Answers vary.

Practice: Students discuss representations of unit fractions. Students find multiples of unit fractions.

- **Games:** Students play the **Playing *Multiplication*** *Wrestling* game by multiply 2-digit by 2-digit numbers. GMP7.1, GMP7.2 See Lesson 4-10 for additional information.
  - Observe: Which students are ready to multiply larger numbers? Which students use a strategy to arrange their cards?
  - Discuss: What is the best way to arrange your cards? How does this game help you improve your multiplication and add
- **Math Boxes:** *Math Journal 2* pages 234–236
- **Home Link:** 7-3

Assessment: Students multiply unit fractions by whole numbers.
Observe students working on Problem 7 on journal page 235, which indicates their understanding of fractions as multiples of unit fractions. Expect students to identify the correct unit fraction for each part of the problem. For those who struggle, have them first find the denominator of the given multiple. Then to find the unit fraction, they keep that denominator and replace the numerator with a 1. Help students see the connection between the multiple and the unit fraction by modeling the unit fraction with fraction circles and then counting out the number of fraction circle pieces indicated by the whole-number multiple.

Differentiation Options:

- **Readiness:** Skip Counting by a Unit Fraction
- **Enrichment:** Writing Missing-Groups Number Stories
- **Extra Practice:** Using a Number Line to Find Multiples of Unit Fractions
- **Activity Cards:** 77–78
- **ELL Support:** Help students read fraction terms by displaying the words for unit fraction with corresponding fraction circle and number-line examples, and the fraction numerical representations. For example, show a circle with one of four sections shaded. Say: *The **circle is** the whole*. Display 14 and emphasize the word one as you say: *one-fourth*. Remind students that a *unit fraction* is a fraction with 1 in the numerator. Repeat with several other fraction circles that show one section shaded.

Lesson 7-4 Multiplying Fractions by Whole Numbers

Standards: 4.NF.4.a, 4.NF.4.b, 4.NF.4.c

Warm Up/Mental Math: Students add fractions with denominators of 10 and 100 without using a tool.

Focus: Math Message - Students solve a multiplication number story. *One lap around the indoor track at Mill Run Elementary School is 1/8 mile. Write a multiplication equation to show the total distance Lucas walked when he completed 3 laps.* $3 * 1/8 = 3/8$ Between what two whole numbers does your answer lie? Between 0 and 1

Practice: Students write multiplication equations to represent fractions as multiples of unit fractions. Students use what they know about multiples of unit fractions to multiply any fraction by a whole number.

- **Games:** Students play the ***Angle Tangle*** game to estimate and measure angles and then find the difference between their estimates and measurements**.** Students draw an angle, estimate its measurement, and then measure it. GMP5.2 Points are given according to the difference between the actual and the estimated measurements. GMP6.2 The winner is the player with the lower score after totaling five rounds. Consider modeling a few rounds.
  - Observe: Which students are able to tell whether an angle's measure is more or less than 90 degrees? Which students are able to use a protractor without assistance?
  - Discuss: What is the first question you ask yourself when estimating the measurement of an angle? How much did playing this game improve your ability to estimate the measurement of an angle?
- **Math Boxes:** *Math Journal 2* pages 237–239
- **Home Link:** 7-4

Assessment: Students apply their understanding of a multiple to multiply a fraction by a whole number. Observe students completing Problems 1 and 2 on journal page 238. Expect them to find the correct answers by using drawings. Some students will be able to write an accurate multiplication equation for each answer. If students struggle, help them work through each problem using repeated addition. Then connect repeated addition to the formula learned in this lesson for multiplying a fraction by a whole number.

Differentiation Options:

- **Readiness:** Multiplying Fractions Using an Addition Model
- **Enrichment:** Multiplying By Groups
- **Extra Practice:** Products < or > 1
- **Activity Cards:** 79
- **ELL Support:** Help students understand the meaning of *between* by having three students stand next to each other in a line. Gesturing to the student in the middle, say: _____ *is between* _____ *and* _____. Ask: *Who is between* _____ *and* _____*?* Then show students a number line from 0 to 2, with 112 marked, and ask: *What number is between 1 and 2?*

Lesson 7-5 Multiplying Mixed Numbers by Whole Numbers

Standards: 4.MD.1, 4.MD.2, 4.NF.4.b, 4.NF.4.c

Warm Up/Mental Math: Students find multiples of whole numbers.

Focus: Math Message: Students solve a fraction number story**.** Pose the following problem: Last week, Tameka practiced the trumpet for 2/3 hour each day. What was the total number of hours she practiced? 14/3, or 4/23 hours

Practice: Students multiply a non-unit fraction by a whole number. Students multiply a mixed number by a whole number.

- **Games:** Students play the ***Divide and Conquer*** **game to** practice division with extended facts. GMP8.1 See Lesson 6-1 for details.
  - Observe: Which students are ready for larger dividends? Which students are confident in their division facts?
  - Discuss: Would you rather be the Caller, the Brain, or the Calculator? Why? Are you ready to play this game with larger numbers
- **Math Boxes:** *Math Journal 2* pages 240–242
- **Home Link:** 7-5

Assessment: Students solve number stories with mixed numbers.
Expect most students to be able to multiply a mixed number by a whole number successfully. As students complete journal pages 240–241, watch for those who are unable to use at least one strategy successfully. Guide them to find a strategy that makes sense to them. For instance, many students may feel more comfortable converting a mixed number to a fraction before multiplying it by the whole number, as that strategy has been practiced in previous lessons. For interested students, consider asking them to write a number story about the number of hours practiced by clarinet players in a week. The answer should lie between the totals for the flute and trumpet players.

Differentiation Options:

- **Readiness:** Reviewing Partial Products
- **Enrichment:** Increasing and Decreasing Products
- **Extra Practice:** Multiple Solutions
- **Activity Cards:** 80
- **ELL Support:** Provide visual aids introducing the vocabulary in the journal pages about the school band, including *flute* and *trumpet sections*, *practice*, *band*, and *member*. This will help students understand the number story context and allow them to attend to the mathematical content. Maintain a display of words with pictures for student reference as they work in partnerships and on their own.

Lesson 7-6 Open Response Three-Fruit Salad (Day 1)

Standards: 4.NF.3.a , 4.NF.4.b, 4.NF.4.c

Warm Up/Mental Math: Students practice division and extended facts

Focus: Math Message - Students determine whether fractions make an exact number of wholes**.** Make tools available for partners to share, such as fraction circles and the Number-Line Poster. *Complete journal page 243. Be prepared to share your thinking with a partner.* GMP5.1, GMP5.2

Practice: Students discuss how they know whether fractions make an exact number of wholes. Students use tools to create recipes for fruit salad using fraction addition and multiplication. Review students' work and plan discussion for reengagement.

- **Games: N/A**
- **Math Boxes:** *Math Journal 2* page 243
- **Home Link: N/A**

Assessment: Planning a Follow-Up Discussion

Review students' work. Use the Reengagement Planning Form (Math Masters, page TA8) and the rubric in the Day 2 Focus activity, Revising Work, to plan ways to help students meet expectations for both the content and practice standards. Look for responses that show how to use tools appropriately to solve the problem and responses that show tools being used inappropriately. Also look for responses with number models that use repeated addition and models involving multiplication of a fraction by a whole number.

Differentiation Options: In Open Response and Reengagement Lessons, differentiation is integral to the reengagement process, so separate Readiness, Extra Practice, and Enrichment activities are not provided.

Lesson 7-6 Open Response Three-Fruit Salad (Day 2)

Standard: 4.NF.4.c

Warm Up/Mental Math: Students review the open response problem and discuss how different tools can be used to solve the problem. They also review how to respectfully discuss others' work.

Focus: Math Message - Students analyze others' work, looking carefully at how different tools were used. Students reengage in the problem by analyzing and critiquing other students' work in pairs and in a whole-group discussion. Have students discuss with partners before sharing with the whole group. Guide this discussion based on the decisions you made in Getting Ready for Day 2. GMP1.4, GMP5.1, GMP5.2

Practice:

- **Games:** N/A
- **Math Boxes:** *Math Journal 2* page 244
- **Home Link:** 7-6

Assessment: Students revise their work from Day 1. Pass back students' work from Day 1. Before students revise anything, ask them to examine their responses and decide how they could be improved. Ask the following questions one at a time. Have partners discuss their responses and give a thumbs-up or thumbs-down based on their own work.

Differentiation Options: In Open Response and Reengagement Lessons, differentiation is integral to the reengagement process, so separate Readiness, Extra Practice, and Enrichment activities are not provided.

Lesson 7-7 Multistep Division Number Stories

Standards: 4.NBT.4, 4.NBT.6, 4.OA.3

Warm Up/Mental Math: Students solve division facts and extended facts.

Focus: Math Message: Students solve a multistep number story. *Josh and two of his friends own a lemonade stand. On a hot Saturday they sold $171 worth of lemonade in 5 hours. They needed $36 to pay for their supplies.* If the boys split the remaining money evenly, how much money did Josh make per hour? $9

Practice: Students discuss strategies for solving multistep division number stories.

- **Games:** Students play the ***Fraction Multiplication Top-It*** game by multiplying a whole number by a fraction. Players each draw one number card and one fraction card to form an equation in which a fraction is multiplied by a whole number. The player with the highest product takes all the cards. Have students record several rounds of play on *Math Masters,* page G2. GMP6.2, GMP6.4
    - Observe: Which students are finding the product accurately? Which students can do the calculation mentally?
    - Discuss: Does this game involve more strategy or luck? Why? How did you check your answers?
- **Math Boxes:** *Math Journal 2* pages 245–247
- **Home Link:** 7-7

Assessment: Students solve and assess the reasonableness of answers to multistep division number stories. Observe students working on Problems 1 and 3 on journal pages 245–246. Expect them to be able to use the partial-quotients algorithm to divide 3-digit numbers by 1-digit numbers. For students who struggle doing the division, review the partial-quotients algorithm and connect it to a visual model, such as a partitioned rectangle. Don't be alarmed if many students need help making sense of the problems, as this is their first exposure to multistep multi-digit division problems.

Differentiation Options:

- **Readiness:** Using the Guide to Solving Number Stories
- **Enrichment:** Writing Division Multistep Number Stories
- **Extra Practice:** Solving Multistep Number Stories
  Activity Cards: 81
- **ELL Support:** Scaffold students' understanding of the vocabulary and contexts in the number stories by accompanying oral and written accounts with visual aids, making it easier for ELL students to attend to mathematical content. And for student reference when solving number stories, provide a pictorial dictionary source or display of words with pictures for the following: lemonade stand, ingredients in lemonade, top hat, bowler hat, baseball cards, albums, raffle tickets, and fruit baskets.

Lesson 7-8 Division Measurement Number Stories

Standards: 4.MD.1, 4.MD.2, 4.NBT.5, 4.NBT.6

Warm Up/Mental Math: Students convert measurement units.

Focus: Math Message: Students divide to solve a measurement number story. *Emily poured an entire 2-liter container of apple juice into 8 separate glasses. Each glass held the same amount.* How many milliliters did each glass hold? 250 mL

Practice: Students discuss division strategies for a measurement number story.

- **Games: Students play the *Fishing for Fractions* (Addition)** game to practice adding fractions. GMP6.4 See Lesson 5-10 for details.
  - Observe: Which students are able to regroup easily? What different strategies are students using to find the sums?
  - Discuss: What strategies did you and your partner use when regrouping? How can drawing diagrams of the problems be helpful?
- **Math Boxes:** *Math Journal 2* pages 248–250
- **Home Link:** 7-8

Assessment: Students solve measurement number stories. Observe as students complete Problems 3 and 4 on journal page 248. Most students should be able to solve division number stories involving whole numbers of measured quantities. Watch for students who struggle and determine whether the difficulty concerns solving division problems or understanding the relationships between the measured quantities. Consider having them highlight the key pieces of information in the number story and list the relationship between the measured quantities before solving. Encourage students to use the *Student Reference Book* to remind them of division strategies.

Differentiation Options:

- **Readiness:** Changing Units
- **Enrichment:** Jumping Frogs and Leaping Lizards
- **Extra Practice:** Dividing to Solve Measurement Number Stories
- **Activity Cards:** 82
- **ELL Support:** Students may be familiar with the term scale to mean a tool for measuring the weight of an object. Measurement scales used in this lesson specify the relationship between two measurement units. Scales can also be the series of marks in regular intervals on a graph or line to represent particular values. Display images of scales being used to weigh objects. Think aloud while using gestures, saying, for example: *This is a bathroom scale. I use it to weigh myself on the scale in pounds. I can convert from pounds to ounces.* Repeat the term in other uses.

Lesson 7-9 Generating and Identifying Patterns

Standards: 4.MD.3, 4.NBT.6, 4.OA.5

Warm Up/Mental Math: Students estimate quotients and write number sentences.

Focus: Math Message: Students build arrays representing rectangular numbers. *Use centimeter cubes to build the following arrays: 1-by-2, 2-by-3, 3-by-4. Be prepared to discuss any patterns you notice.* GMP7.1

Practice: Students explore the concept of rectangular numbers. Students look for a rule to generate rectangular numbers. Students plot data on a line plot and solve number stories.

- **Games: N/A**
- **Math Boxes:** *Math Journal 2* pages 251–254
- **Home Link:** 7-9

Assessment: Students look for patterns in the sequence of rectangular numbers. Expect students to correctly solve Problem 3c on journal page 252. As they complete the page, watch for those who struggle trying to continue or describe number patterns. You may wish to highlight the numbers that are key to each pattern, such as the consecutive even addends in Problem 3a. You may also wish to provide students with sentence frames like this one to help them describe patterns: "To find the next rectangular number, add /subtract/multiply/divide the next even number."

Differentiation Options:

- **Readiness:** Finding Patterns
- **Enrichment:** Building Rectangular Pyramids
- **Extra Practice:** Trading Cards
- **Activity Cards:** 83
- **ELL Support:** Scaffold students' understanding of the term *pattern* by preparing a T-chart showing examples and non-examples of both shape and number patterns. Point to a simple shape pattern and ask: What comes next? Say: *This is a pattern. You can predict what comes next.* Repeat with a numerical pattern. Then point to a non-example and ask: What comes next? When it appears that the next item cannot be predicted, say: *This is not a pattern. You cannot predict what comes next.* Provide further examples and non-examples, asking: Where should this go? Which column? Is this a pattern?

Lesson 7-10 Solving Multistep Fraction Number Stories

Standards: 4.MD.1, 4.MD.2, 4.NF.2, 4.NF.4.c

Warm Up/Mental Math: Students add mixed numbers

Focus: Math Message - Students solve a comparison number story involving fractions and units of time. Look at the table on journal page 256. What is the fastest way to burn 100 calories? Running stairs. How long would it take, in minutes, to burn 100 calories doing this activity? (6 minutes) In seconds? (360 seconds)

Practice: Students share fraction comparison strategies.

- **Games: N/A**
- **Math Boxes:** *Math Journal 2* pages 255–257
- **Home Link:** 7-10

Assessment: Students solve multistep number stories involving fractions and units of time. Expect students to be able to solve Problem 1 on journal page 256. Some may be able to solve Problems 2–4 independently. For those who struggle trying to find the number of minutes in fractional parts of an hour, have them complete the Readiness activity, listing the time equivalents next to the fractions in the table on journal page 256. For students who struggle solving multistep number stories, help them identify each sequential step needed to answer the questions.

Differentiation Options:

- **Readiness:** Fractions of Hours
- **Enrichment:** Writing Fraction Multistep Number Stories
- **Extra Practice:** Solving Multistep Number Stories with Fractions
- **Activity Cards:** 84
- **ELL Support:** Prior to the lesson, show pictures or pantomime some of the activities listed in the chart and on journal page 256 to pre-teach vocabulary used in the number stories. Create an anchor chart showing a clock divided into the different fractions involved for students to refer back to as they are working. This will help English language learners understand the problem contexts, allowing them to focus attention on the mathematics required to solve the problems.

Lesson 7-11 Weights of State Birds

Standards: 4.MD.1, 4.MD.2, 4.NF.3.c, 4.NF.3.d, 4.NF.4.b, 4.NF.4.c

Warm Up/Mental Math: Students subtract mixed numbers

Focus: Math Message - Students convert pounds and fractions of pounds to ounces. *Complete Problem 1 on journal page 258.*

Practice: Students discuss strategies for converting fractions and mixed numbers of pounds to ounces.

- **Games:** Students play the ***Decimal Top-It*** game to practice making and identifying the largest possible 2-digit decimal numbers. GMP7.2 See Lesson 4-13 for more information.
  - Observe: Which students are able to read the decimal numbers easily? Which students are able to justify the decimal comparisons?
  - Discuss: How can you tell which player has the highest decimal number? How does this game help you understand decimal numbers better?
- **Math Boxes:** *Math Journal 2* pages 258–260
- **Home Link:** 7-11

Assessment: Students solve multistep fraction number stories involving typical weights of state birds. Observe students working on Problem 2 on journal page 258. Expect them to find the total number of pounds using fraction addition or multiplication and to successfully convert between pounds and ounces. For students who struggle, suggest drawing a picture to find the weight of the 6 birds. Start by drawing 2 circles divided into fourths. Then shade 6 fourths to represent the 6 birds, which shows that 64 is the same as 11/2. Remind students to use the conversion tables at the top of the journal page to help them go from pounds to ounces, looking first at the conversion from 1 pound to 16 ounces and then at the conversion from 1/2 pound to 8 ounces.

Differentiation Options:

- **Readiness:** Converting Pounds to Ounces
- **Enrichment:** Converting Measurement Units with Fractions
- **Extra Practice:** Shipping Paperweights
- **Activity Cards:** 85–86
- **ELL Support:** Help students gain familiarity with the terms *pound* and *ounce* by showing a picture of a scale. Call attention to the abbreviation "lb." written for pound and "oz." written for ounces. Remind students that an abbreviation is a short written form of a word. For example: "St." is used for street, and "Mon." is used for Monday. If you have Spanish-speaking English language learners, make the connection to the Spanish word for pound, which is *libra.*

Lesson 7-12 Decimal Number Stories

Standards: 4.NF.3.a, 4.NF.3.c, 4.NF.3.d, 4.NF.4.b, 4.NF.4.c, 4.NF.6

Warm Up/Mental Math: Students convert fractions to decimals.

Focus: Math Message: Students relate fractions and decimals to money. Pose the following questions for students to answer on their slates: What fraction of a dollar is 1 dime? (1/10) What fraction of a dollar is 1 penny? (1/100) What fraction of a dollar is 7 dimes and 8 pennies? *Write your answer as a fraction and a decimal.* (78/100; 0.78)

Practice: Students convert between fractions and decimals. Students solve number stories involving simple decimals.

- **Games:** Students play the ***Angle Add-Up*** game to build on their understanding of angle measures as additive. GMP6.4 See Lesson 6-11 for details.
    - Observe: Which students are able to tell whether an angle's measure is more or less than 90 degrees? Which students are able to use a protractor independently?
    - Discuss: Is it easier to measure a larger angle or to add two smaller angles together? What is the best way to arrange your cards to get the highest score?
- **Math Boxes:** *Math Journal 2* pages 261–263
- **Home Link:** 7-12

Assessment: Students solve multistep number stories with decimals. Expect students to apply their understanding of converting decimals to fractions when solving these problems. As they complete Problems 1 and 2 on journal page 261, watch for students who are struggling to convert the monetary amounts to fractions with denominators 10 and 100. Have them use base-10 blocks or hundred grids to model the fractions and decimals.

Differentiation Options:

- **Readiness:** Finding Fraction and Decimal Equivalents
- **Enrichment:** Making Goodie Bags
- **Extra Practice:** Writing Number Stories with Decimals
- **Activity Cards:** 87
- **ELL Support:** Scaffold students' learning of the names of coins by preparing an anchor chart with the title: Coins. In the first column of the chart, tape real dimes and pennies, **displaying** both sides of the coins. In the second column, write the names of the coins, and in the third, draw circles with the letters D or P inside them. In the fourth column, list the value of each coin in decimal form, in the fifth the value of each coin in fraction form, and in the sixth the number in word form.

Lesson 7-13 Displaying Insect Data

Standards: 4.MD.4, 4.NF.3.a, 4.NF.3.c

Warm Up/Mental Math - Students add and subtract fractions.

Focus: Math Message - Students measure line segments to the nearest 1/8 inch and compare results. Complete Math Masters, page 290. GMP6.4

Practice: Students review measuring to the nearest 1/8 inch, and they add and subtract mixed numbers. Students gather and plot data.

- **Games:** Students play the ***Fraction Multiplication Top-It*** game to practice multiplying a whole number by a fraction. See Lesson 7-7 for additional information. GMP6.2, GMP6.4
- **Math Boxes:** *Math Journal 2* pages 264–267
- **Home Link:** 7-13

Assessment: Students answer questions based on line plots. Expect students to be able to complete the line plot on journal page 266 and to correctly answer Problem 2 on journal page 267. As students complete journal page 267, watch for anyone who is adding and subtracting denominators. Have them use fraction circles to model the addition and subtraction problems.

Differentiation Options:

- **Readiness:** Paper Airplane Line Plot
- **Enrichment:** Plotting Straw Lengths
- **Extra Practice:** Dog Walking Distances
- **Activity Cards:** 88
- **ELL Support:** Role-play to introduce the term *nearest* by connecting it to *near* and contrasting it with *far away*. For example, place a book on a table and set a red crayon about 3 feet away, a yellow crayon about 12 inches away, and a green crayon about 2 inches away. Gesture as you say: *The red crayon is far away from the book. The yellow crayon is near the book. The green crayon is nearest to the book*. Model using the terms with other objects. Have students place objects far from, near to, and nearest to the book. Then use the terms in relation to numbers on a number line. Show three numbers and ask questions like this: Which of these numbers is nearest to 10?

Lesson 7-14 (2-day lesson)
Self-Assessment: Students will complete the Self-Assessment. **Assess:** ● **Unit 7 Assessment**: These items reflect mastery expectations to this point ● **Unit 7 Challenge (Optional):** Students may demonstrate progress beyond expectations ● **Solving the Open Response Problem** ● **Discussing the Problem:** The class discusses students' explanations **Look Ahead:** ● **Math Boxes 7-14**: Preview for Unit 8 ● **Home Link 7-14** - Students take home the Family Letter that introduces Unit 8 **Differentiation Options:** See TE for adjustments to the assessment

Student Resources	
Print	Student Math Journal Volume 2
Print	Student Reference Book
Print/Online	Activity Cards
Print/Online	EM Games Online

Teacher Resources	
Print	Teacher's Lesson Guide Volume 2
Print/Online	Spiral Tracker
Print/Online	Math Masters
Print/Online Online Online Online Online Online Online	Assessment Handbook eToolkit ePresentations https://learnzillion.com www.mathgoodies.com www.commoncoreconversation.com https://grade4commoncoremath.wikispaces.hcpss.org/

Unit Plan Title	Fraction Operations; Applications
Suggested Time Frame	19 days including flex/game days

Stage 1: Desired Results

Overview / Rationale

In this unit students apply their knowledge of fractions, number concepts, patterns, and geometry to different real-world scenarios. Student learning will focus on two clusters of the NJ Student Learning Standards for Math (NJSLS-M), Numbers and Operations with Fractions and Measurement and Data.

Standards

4.NF.3c Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. 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.NF.3d Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. 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.4b Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. Understand a multiple o f 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 $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as 6/5. (In general, $n \times (a/b) = (n \times a)/b$.)*

4.NF.4c Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. 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?*

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.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.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.

Technology Integration
__X__ **8.1 Educational Technology:** All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
- Student Websites - Teacher Websites - SMART board
____ **8.2 Technology Integration, Engineering, Design and Computational Thinking – Programming** All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

INTEGRATED SOCIAL AND EMOTIONAL LEARNING COMPETENCIES
The following social and emotional competencies are integrated in this curriculum document:

Self-Awareness
_____Recognize one's own feelings and thoughts
_____Recognize the impact of one's feelings and thoughts on one's own behavior
_____Recognize one's personal traits, strengths and limitations
_____Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management
__x__Understand and practice strategies for managing one's own emotions, thoughts and behaviors
__x__Recognize the skills needed to establish and achieve personal and educational goals
__x__Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness
__x__Recognize and identify the thoughts, feelings, and perspectives of others
_____Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
_____Demonstrate an understanding of the need for mutual respect when viewpoints differ
_____Demonstrate an awareness of the expectations for social interactions in a variety of setting

Responsible Decision Making
__x__Develop, implement and model effective problem solving and critical thinking skills
_____Identify the consequences associated with one's action in order to make constructive choices
_____Evaluate personal, ethical, safety and civic impact of decisions

Relationship Skills
_____Establish and maintain healthy relationships
__x__Utilize positive communication and social skills to interact effectively with others
_____Identify ways to resist inappropriate social pressure
_____Demonstrate the ability to present and resolve interpersonal conflicts in constructive ways
_____Identify who, when, where, or how to seek help for oneself or others when needed

In this unit plan, the following 21st Century Life and Careers skills are addressed:				
Check ALL that apply – **21st Century Themes**			**Indicate whether these skills are:** ● **E – encouraged** ● **T – taught** ● **A – assessed** **Career Ready Practices**	
9.1	**Personal Financial Literacy**		E	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		TA	CRP2. Apply appropriate academic and technical skills.
	Money Management			CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management		ETA	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing			CRP5. Consider the environmental, social and economic impacts of decisions.
X	Becoming a Critical Consumer			CRP6. Demonstrate creativity and innovation.
X	Civic Financial Responsibility			CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		ETA	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	**Career Awareness, Exploration, and Preparation**			CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		E	CRP11. Use technology to enhance productivity.
	Career Preparation			CRP12. Work productively in teams while using cultural global competence.

Interdisciplinary Connections

Other standards covered:

RI.4.3 - Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

RI.4.4 - Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a *grade 4 topic or subject area*.

RI.4.7 - 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.

SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly

Essential Questions:	Enduring Understandings:
● How can I use fractions in real life? ● How can patterns be used to determine standard formulas for perimeter?	***Students will understand that…*** ● Students will determine a variety of uses for fractions. ● Students will determine the perimeter of a shape using patterns such as repeated addition.
Knowledge:	**Skills:**
Students will know… ● Students solve challenging multistep number stories. ● Students apply their understanding of the additive nature of angle measures to real-life situations. ● Students find measures of pattern-block angles and use known angle measures to find measures of other angles. ● Students discuss others' work and then revise their own work to include written generalizations. ● Students apply knowledge of line symmetry to create symmetric shapes and quilting patterns. ● Students make line plots and add and subtract mixed numbers to answer questions regarding the data. ● Students compute with fractions and mixed numbers as they apply a perimeter formula for rectangles in real-world and mathematical problems. ● Students solve number stories by converting decimals to fractions ● Students find the area of rectangles using fractions and mixed numbers. ● Students multiply fractions by whole numbers to solve number stories. ● Students convert liquid measurements and solve problems involving fractions. ● Students use understanding of place value and properties of operations to solve puzzles.	**Students will be able to…** ● Add and subtract mixed numbers. ● Add and subtract fractions in number stories. ● Multiply a fraction by a whole number. ● Multiply a fraction by a whole number in number stories, using visual models and equations to represent the problem. ● Add two fractions with denominators 10 and 100. ● Use decimal notation for fractions with denominators 10 or 100. ● Use the four operations to solve number stories involving whole numbers of measured quantities. ● Solve addition and subtraction problems to find unknown angle measures on a diagram in real world and mathematical problems. ● Solve problems with fractions and conversion of units of measure.

● Students find equivalent names for numbers.	

Stage 2: Acceptable Evidence

Assessments	
Formative Assessments: ● Assessment Check-In ● Mental Math and Fluency ● Exit Slips/Slate Assessments ● Informal Observations ● Math Journal ● Home Links ● EDM Games ● Self Assessment ● Questioning	**Summative:** ● Beginning of the Year Assessment ● Unit Progress Check ● Open Response ● Quizzes ● Tests ● Student Work Products

Stage 3: Learning Experiences

Lesson 8-1 Extending Multistep Number Stories

Standards: 4.NBT.4, 4.NBT.5, 4.NBT.6, 4.OA.3

Warm Up/Mental Math: Students multiply fractions by whole numbers.

Focus: Math Message: Students solve a multistep number story. *Fourth-grade students from two elementary schools, Dayton and Cleveland, are participating in a 2-mile race at a local park. Once the students arrive, they are split into 4 equal groups. Each group starts the race at a different time, so that there are not too many students running in the same part of the racecourse at the same time. Dayton School brings 3 fourth-grade classes with 32 students in each. Cleveland School brings 4 fourth-grade classes with 27 students in each.* How many students are in each group? (51 students)

Practice: Students discuss and solve number stories with challenging contexts and phrasing.

- **Games: Students play the *Fishing for Fractions*** (Subtraction) game in which they "fish" for a fraction card with a like denominator and then subtract the smaller of the two fractions from the larger one. GMP6.4 See Lesson 5-10 for details.
    - Observe: Which students are fluent subtracting fractions with like denominators? Which students could explain this game to a new student?
    - Discuss: What do you think is the best strategy to win this game? What do you find challenging about this game?
- **Math Boxes:** *Math Journal 2* pages 270–272
- **Home Link:** 8-1

Assessment: Students solve challenging number stories in order to crack a code. Observe students working on journal page 271, paying close attention to their work on Problems 5 and 6, which are most similar to problems they have seen before. Expect students to make sense of and solve these problems accurately. If students struggle, ask them what they need to know first in order to solve each problem. Then ask how they can find out what they need to know. Continue to walk students through the problems, asking what they need to know first, next, and so on.

Differentiation Options:

- **Readiness:** Using the Guide to Solve Multistep Number Stories
- **Enrichment:** Writing Multistep Number Stories with Different Operations
- **Extra Practice :** Comparing Zoo Admissions
- **Activity Cards:** 89
- **ELL Support:** To help students understand that cracking the code is an expression for figuring out a secret code, create a short problem using the same simple cipher, or code, used in the lesson, where A = 1, B = 2, C = 3, and so on. Display the code. Demonstrate how to decode a short word or phrase like: 9_12, 15, 22, 5_13, 1, 20, 8. I love math. Then

ask students to use the code to decode another word or short phrase, or to come up with their own secret code for a word for other students to solve.

Lesson 8-2 Real-Life Angle Measures as Additive

Standards: 4.MD.6, 4.MD.7, 4.NBT.4

Warm Up/Mental Math: Students multiply fractions by whole numbers.

Focus: Math Message - Students find unknown angle measures in real-life situations. *Complete journal page 273. Be prepared to explain how you found your answers.* GMP4.

Practice: Students consider real-life applications of finding unknown angle measures. Students solve number stories about ice hockey involving addition and subtraction of angle measures. Students practice multiplying fractions by whole numbers.

- **Games : N/A**
- **Math Boxes:** *Math Journal 2* pages 273–277
- **Home Link:** 8-2

Assessment: Students add and subtract angle measures. Expect students to correctly complete the table for Problem 1 on journal page 274. Watch for students who struggle finding the unknown angle measures. Point out that the total of the second and third columns will always be 360°, and help students write addition or subtraction number models to find the unknown measures.

Differentiation Options:

- **Readiness:** Playing *Angle Add-Up*
- **Enrichment:** Finding Angles of Fraction Circle Pieces
- **Extra Practice:** Measuring Baseball Angles
- **Activity Cards: N/A**
- **ELL Support:** Pre-teach some of the vocabulary in the word problems prior to the lesson by showing pictures related to the terms, such as a puck, an ice rink, a hockey net, blind spot, and vision. This will help English language learners understand the problem contexts, allowing them to focus more exclusively on the math presented in the lesson. Also consider pairing ELL students with native speakers when they are working on the journal pages.

Lesson 8-3 Open Response Pattern-Block Angles (Day 1)

Standards: 4.MD.7

Warm Up/Mental Math: Students multiply fractions by whole numbers.

Focus: Math Message: Students fit pattern-block angles together to determine how many of one angle fit inside another. *Working with a partner, use pattern blocks to complete journal page 278. List as many observations as you can for Problem 4.* GMP1.1, GMP5.2

Practice: Students describe how they arranged pattern blocks to fill angles of other pattern blocks and compare the sizes of the angles. Students find measures of pattern-block angles by combining and decomposing angles of known sizes and explain why two different combinations of smaller angles result in the same measure for a larger angle. Review students' work and plan discussion for reengagement.

- **Games: N/A**
- **Math Boxes:** *Math Journal 2* page 278
- **Home Link: N/A**

Assessment: Review students' work. Use the Reengagement Planning Form (*Math Masters,* page TA8) and the rubric in the Day 2 Focus activity: Revising Work to plan ways to help students meet expectations for both the content and practice standards. Look for responses that have the correct angle measures, drawings, and calculations for Problems 1 and 2. Look for responses to Problem 3 that imply that Julie's and Perry's solutions *should* be the same and that address other aspects of the additive angle generalization (for example, Julie and Perry both used a combination of angles with known measures to determine the measure of a larger angle).

Differentiation Options: In Open Response and Reengagement Lessons, differentiation is integral to the reengagement process, so separate Readiness, Extra Practice, and Enrichment activities are not provided.

- **Activity Cards : N/A**

Lesson 8-3 Open Response Pattern-Block Angles (Day 2)

Standards: 4.MD.7

Warm Up/Mental Math: Students review the open response problems and discuss what would make good responses and how to make a generalization about what they learned. They review how to discuss other students' work

Focus: Math Message :Students analyze others' work, discuss the additive angle generalization in the work, and discuss how to write a generalization

Practice: Students reengage in the problem by analyzing and critiquing other students' work in pairs and in a whole-group discussion. Have students discuss with partners before sharing with the whole group. Guide this discussion based on the decisions you made in Getting Ready for Day 2.

- **Games: N/A**
- **Math Boxes:** *Math Journal 2* page 279
- **Home Link:** 8-3

Assessment: Students revise their answers and explanations and include written generalizations. Collect and review students' revised work. For the content standard in Problems 1 and 2, expect students to correctly find the measures of a small angle (30°) and large angle (150°) of the white rhombus, draw a picture of the pattern blocks, and include a number model or explain in words how to calculate each angle measure. You can use the rubric below to evaluate students' revised work for GMP8.1

Differentiation Options: In Open Response and Reengagement Lessons, differentiation is integral to the reengagement process, so separate Readiness, Extra Practice, and Enrichment activities are not provided.

- **Activity Cards : N/A**

Lesson 8-4 Extending Line Symmetry

Standards: 4.G.3

Warm Up/Mental Math: Students write equivalent decimals for fractions.

Focus: Math Message - Students identify objects with multiple lines of symmetry. *Find an object in the room that has at least two lines of symmetry. On your slate, write the name of the object and record the number of lines of symmetry it has.*

Practice: Students create shapes with a specified number of lines of symmetry. Students use estimates to check their solutions to multistep number stories.

- **Games: N/A**
- **Math Boxes:** *Math Journal 2* pages 280–284
- **Home Link:** 8-4

Assessment: Students create shapes with a specified number of lines of symmetry. Observe the lines of symmetry students draw in the shapes they create. Expect them to draw lines of symmetry in the correct positions, such that each line divides the shape into two matching parts. Have struggling students draw the shapes on paper using the Geometry Template and cut them out. Students can then fold the shapes to help them identify and draw lines of symmetry. Have students who excel use pattern blocks to create a shape with the greatest number of lines of symmetry they can.

Differentiation Options:

- **Readiness:** Creating Symmetric Patterns
- **Enrichment:** Rotating Figures
- **Extra Practice:** Making a Quilt
- **Activity Cards:** 90–91
- **ELL Support:** Use real objects or representations (replicas) of objects that have lines of symmetry, such as a book, a desk, or a piece of paper. Model drawing a line of symmetry, and then have students trace it as you say: *This is a line of symmetry. This side matches the other side.*

Lesson 8-5 Line Plots: 1/2, 1/4, and 1/8 Inches

Standard: 4.MD.4

Warm Up/Mental Math: Students subtract fractions and mixed numbers.

Focus: Math Message - Students consider perimeter, length, and height. Sydney wants to mail a thank-you card that is 51/2 inches high and 81/2 inches long. Would knowing the perimeter of an envelope help Sydney determine whether the card will fit in it? Be prepared to support your answer with an example.

Practice: Students share ways of thinking about the Math Message. Students collect and plot data in fractions of an inch and compare with the envelope data line plot.

- **Games:** Students play the ***Fraction Multiplication Top-It*** game to practice multiplying a fraction by a whole number. Players draw one whole-number card and one fraction card and multiply the fraction by the whole number. GMP6.2, GMP6.4 See Lesson 7-7 for details.
    - Observe: Which students are able to do the multiplication mentally? Which students are actively engaged in this game?
    - Discuss: What strategy did you use to get the highest product? What mathematics did you learn from watching other players?
- **Math Boxes:** *Math Journal 2* pages 285–288
- **Home Link:** 8-5

Assessment: Students make a line plot and answer questions about data measured in 1/2, 1/4, and /18 fractions of an inch. Students should be able to complete the line plot and use it to solve problems involving addition and subtraction of fractions in Problems 4–5 on journal page 287. As students are completing the line plot on journal page 286, watch for those who have difficulty working with fractions with different denominators. For these students, suggest that they write equivalent fractions for halves and fourths, so that all fractions are in eighths, before plotting the data.

Differentiation Options:

- **Readiness :** Measuring to the Nearest 1/8 Inch
- **Enrichment :** Creating Line Plots with Fraction Data
- **Extra Practice :** Creating a Greeting Card Line Plot
- **Activity Cards :** 92–93
- **ELL Support:** Students may have heard the term *plot* used to mean events in a story or a scheme to carry out a secret plan. Explain that in math a *line plot* is a special kind of graph that uses Xs placed above a number line to show how often something occurs or how many of something there are. Show a few examples of line plots, asking simple questions related to the data represented like these: How many _____ are shown. on this graph? What is the greatest number of _____? The least?

Lesson 8-6 Fractions and Perimeter

Standards: 4.MD.2, 4.MD.3

Warm Up/Mental Math: Students add fractions and mixed numbers.

Focus: Math Message: Students find the perimeter of a rectangle. *Find the perimeter of the rectangle.* 18/8, or 22/8 inches.

Practice: Students discuss working with fractional dimensions. Students solve a challenging perimeter problem.

- **Games:** Students play the ***Division Dash*** (Advanced Version) game to practice dividing a 4-digit dividend by a 1-digit divisor. GMP7.2 Students draw 5 cards to form a 4-digit dividend and a 1-digit divisor. The object is to be the first player to reach a score of 5,000. See Lesson 6-10 for details.
  - Observe: Which students are using an efficient division strategy? Which students are consistently accurate in their computations?
  - Discuss: What math skills besides division are helpful in this game? If you could rearrange the cards to form any dividend and divisor you wish, could you win the game in fewer turns? How?
- **Math Boxes:** *Math Journal 2* pages 289–291
- **Home Link:** 8-6

Assessment: Students find unknown dimensions of rectangles. Expect students to be able to use a formula to find the perimeters of the rectangles in Problems 1 and 2 on journal page 290. For Problems 3–6, watch for students who solve for unknown side measures by simply subtracting the known side measure once from the perimeter rather than first doubling the known side measure and then halving the resulting difference. Have students label the side opposite the one with the known measure and draw an answer blank on the side opposite the one with the unknown measure. After students solve, have them fill in both blanks so that all four sides of the rectangle are labeled.

Differentiation Options:

- **Readiness:** Finding Geoboard Perimeters
- **Enrichment:** Finding the Dimensions
- **Extra Practice:** Measuring to Find Perimeter
- **Activity Cards:** 94
- **ELL Support:** Scaffold students' understanding of the problem contexts of the number stories by accompanying the oral and written accounts with a variety of visual aids to help beginning ELL students attend to the mathematical content. In addition, when reading number stories, provide a pictorial dictionary source or maintain a display of words with pictures for student reference, such as different styles of fencing panels and a backyard partially surrounded by an incomplete fence.

Lesson 8-7 More Decimal Number Stories

Standards: 4.NF.5, 4.NF.6

Warm Up/Mental Math: Students convert metric units of liquid measure.

Focus: Math Message: Students find the perimeter of a rectangle. *Find the perimeter of the rectangle and write it on your slate.* 18.8 cm

Practice: Students apply their knowledge of fractions and decimals to find the perimeter of a rectangle.

- **Games: Students play the *Fishing for Fractions* (Mixed-Number Addition) game** in which they use whole-number cards and fraction cards to create mixed numbers. GMP6.4 See Lesson 6-1 for details.
  - Observe: Which students are ready to work with 3 addends? Which students fluently regroup when the sum is greater than 1?
  - Discuss: What strategies do you use to regroup when the sum is greater than 1? How could you revise this game for multiplying fractions by a whole number?
- **Math Boxes:** *Math Journal 2* pages 292–294
- **Home Link:** 8-7

Assessment: Students convert decimals to fractions. Expect most students to be able to translate from decimal notation to fraction notation, compute with the fractions, and then translate back to decimal notation. As they complete Problems 1 and 2 on journal page 292, watch for students who struggle converting decimals to fractions and back to decimals. Encourage them to use base-10 blocks or centimeter rulers to help them solve the problems.

Differentiation Options:

- **Readiness:** Converting and Adding Tenths and Hundredths
- **Enrichment:** Designing a Baseball Cap Rack
- **Extra Practice:** Solving Olympic Number Stories
- **Activity Cards: N/A**
- **ELL Support:** Create a name-collection box using familiar names to scaffold understanding of the term *equivalent*. For example, write a student's name in the tag of a name-collection box. Point out that this box is supposed to contain a collection of names for the same person. Talk about different equivalent names for the student as you add them to the box: nickname, son/daughter, student, fourth grader, brother/sister, and so on. Make the connection to decimals and fractions, which can be represented in different ways and be equivalent.

Lesson 8-8 Areas of Rectangles with Fractional Side Lengths

Standards: 4.G.1, 4.G.3, 4.MD.2, 4.MD.3, 4.NBT.2, 4.NF.2, 4.NF.3.a, 4.NF.3.c, 4.NF.3.d, 4.NF.4.b, 4.NF.4.c, 4.NF.5, 4.NF.6, 4.OA.3

Warm Up/Mental Math: Students add fractions with denominators of 10 and 100.

Focus - Math Message: Students approximate the area of a rectangle. Display the rectangle shown below. Between what two whole numbers does the area measure of rectangle ABCD lie? 3 and 4

Practice: Students multiply fractions by whole numbers. Students multiply mixed numbers by whole numbers.

- **Games: Playing *Multiplication Wrestling* Game** Students practice multiplying 2-digit numbers by 2-digit numbers. To practice multiplying 2-digit numbers by 2-digit numbers, students play *Multiplication Wrestling*. GMP7.1, GMP7.2 See Lesson 4-10 for details.
- **Math Boxes:** *Math Journal 2* pages 295–297
- **Home Link:** 8-8

Assessment: Students multiply fractions by whole numbers. Observe students completing journal page 296. Expect them to be able to solve Problems 1 and 2 accurately. For students who struggle, suggest recording a number model first and then using a manipulative for the fraction operations. Students who excel can measure to find the dimensions, perimeter, and area of rectangular items in your classroom to the nearest 18 inch. Suggested items include a shelf, a counter, and a rug**.**

Differentiation Options:

- **Readiness:** Finding Area in Fractions of Units
- **Enrichment:** Finding Area and Unknown Side Lengths with Decimals
- **Extra Practice:** Measuring and Finding Area Using Fractions of Inches
- **Activity Cards: N/A**
- **ELL Support:** Use visuals to introduce the term *floor plan*. Show a picture of a room and an example of a corresponding floor plan. Describe and demonstrate how the floorplan shows the view from above and where everything in the room is located.

Lesson 8-9 More Fraction Multiplication Number Stories

Standards: 4.NF.2
Warm Up/Mental Math: Students solve division problems.
Focus - Math Message: Students solve a number story with mixed numbers**.** *Marta's sewing machine needle lasts for about 71/2 hours of sewing time before it needs to be replaced. Marta bought 3 packages of needles. Each package contains 5 needles. If Marta sews for about 31/2 hours each day,* will her needles last more than or less than 3 weeks? **(**More)
Practice: Students share strategies for solving a number story. Students convert measurements, apply the area formula, and multiply a fraction by a whole number to solve a number story.

- **Games: Playing *Fishing for Fractions* (Mixed-Number Subtraction) Game** Students play a version of *Fishing for Fractions* to practice subtracting mixed numbers. To practice subtracting mixed numbers, students play a variation of *Fishing for Fractions* in which they use whole-number cards and fraction cards to create mixed numbers. GMP6.4 See Lesson 6-3 for details.
    - Observe: Which students are able to regroup their mixed numbers easily? Which students demonstrate use of a strategy when constructing their mixed numbers and/or fishing for fractions?
    - Discuss: What strategies help you regroup when necessary? Can you think of a way to revise this game to make it more challenging?
- **Math Boxes:** *Math Journal 2* pages 298–301
- **Home Link:** 8-9

Assessment: Students multiply fractions and mixed numbers by whole numbers to solve number stories. Expect students to be able to multiply a fraction by a whole number to solve Problems 1–2 on journal page 300. Watch for those who multiply both the numerator and the denominator by the whole number. Have them draw a picture or diagram to represent their solutions to the number stories.

Differentiation Options:

- **Readiness:** Solving Multistep Number Stories
- **Enrichment:** Writing Multistep Number Stories about Movies
- **Extra Practice:** Practicing for an Audition
- **Activity Cards:** 95
- **ELL Support:** Scaffold students' understanding of the problem contexts in the number stories by accompanying oral and written accounts with a variety of visual aids (for example, a sewing machine, packages of sewing needles, fabric, and shorts). In addition, provide a pictorial dictionary or maintain a display of words with pictures for students to consult when reading number stories.

Lesson 8-10 Fractions and Liquid Measures

Standards: 4.MD.1, 4.MD.2, 4.NBT.2, 4.NBT.3, 4.NBT.4, 4.NBT.5, 4.NBT.6, 4.NF.2, 4.NF.3.a, 4.NF.3.c, 4.NF.3.d, 4.NF.4.b, 4.NF.4.c, 4.OA.3

Warm Up/Mental Math: Students convert U.S. customary units of liquid measure.

Focus: Math Message: Students convert between gallons and pints. *Complete the 2-column table on your slate*

Practice: Students convert units, including fluid ounces. Students solve problems about the amounts of various ingredients needed to make enough punch for a party. Students divide larger numbers and interpret remainders

- **Games : N/A**
- **Math Boxes:** *Math Journal 2* pages 302–305
- **Home Link:** 8-10

Assessment: Students solve number stories and convert liquid measures. Most students should be able to choose one of the strategies (whether to convert to fluid ounces, cups, or a combination of the two) to add and subtract the mixed numbers to solve the measurement number stories. As students complete journal page 302, watch for those who struggle converting fractions of cups to fluid ounces and confuse the units of measurement when adding or subtracting the fractions. Have these students make a table or use the measurement scale to convert all the measurements into one unit.

Differentiation Options:

- **Readiness:** Showing Liquid Measurements
- **Enrichment:** Converting Units of Liquid Measure
- **Extra Practice:** Solving Liquid Measurement Puzzles and Problems
- **Activity Cards: N/A**
- **ELL Support:** Students may have heard the term *hold* used in everyday contexts, as in holding hands or holding your breath. Demonstrate a few of the different meanings of the term, using contexts that you think are familiar to your students. Then demonstrate the meaning of the term as it relates to capacity, using think-aloud statements like these: *This mug holds a lot of water. This small cup does not hold much water.* Ask short response questions like this one: Which one do you think will hold more?

Lesson 8-11 Fractions and Measurement

Standards: 4.MD.1,4.MD.2, 4.MD.5.a, 4.MD.5.b, 4.MD.6, 4.MD.7,4.NBT.4, 4.NBT.5, 4.NBT.6, 4.NF.1, 4.NF.2, 4.NF.3.c, 4.NF.3.d , 4.NF.4.b, 4.NF.4.c

Warm Up/Mental Math: Students multiply multi-digit factors.

Focus: Math Message: Students solve a fraction comparison number story. ***Answer the following question, using information in the table at the top of journal page 306. Write your answer on your slate*****:** Should a 1-pound 9-week-old puppy eat more than, less than, or the same amount as a 1-pound, 9-month-old puppy? (More: 1/2 > /18 or 1/8 < 1/2

Practice: Students analyze fraction data from a table. Students compute with fractions and convert units.

- **Games: Playing *Angle Add-Up* Game** Students use addition and subtraction to find unknown angle measurements. To further explore the idea that angle measures are additive, students draw angles and use addition and subtraction to find unknown angle measurements. See Lesson 6–11 for details. GMP6.4
    - Observe: Which students are able to add and subtract fluently? Which students can read the 360-degree protractor easily?
    - Discuss: How could you estimate the sum of the two angles before measuring either of them? What strategy did you use to try to get the highest score?
- **Math Boxes:** *Math Journal 2* pages 306–308
- **Home Link:** 8-11

Assessment: Students solve problems and convert measurements. Expect students to be able to multiply a fraction by a whole number in Problems 2 and 3. As they complete Problems 2–4 on journal page 307, watch for those who struggle solving the problems because they need reminders for the conversions between unit measures. Have them use a measurement scale or record the relationship between the units at the top of their page.

Differentiation Options:

- **Readiness:** Understanding Fractions of Pounds
- **Enrichment:** Fishing with Pounds and Ounces
- **Extra Practice:** Understanding Ounces
- **Activity Cards:** 96
- **ELL Support:** Help students understand the narrative content of the number stories by accompanying oral and written accounts with a variety of visual aids, such as advertisements for dog food, serving size cups, and dogs at various ages, which will help beginning ELL students attend to the mathematical content. In addition, provide a pictorial dictionary source or maintain a display of words with pictures for students' reference when reading number stories.

Lesson 8-12 Applying Understandings of Place Value and Operations

Standards: 4.NBT.4

Warm Up/Mental Math: Students multiply mixed numbers by whole numbers.

Focus: Math Message: Students solve an addition problem with missing digits. Display the problem below for students to solve on slates. *Fill in the missing digits.* GMP7.2 *Be prepared to discuss your strategies.*

Practice: Students share strategies for solving the Math Message problem. Students use understandings of place value and properties of operations to solve addition and subtraction puzzles

- **Games: N/A**
- **Math Boxes:** *Math Journal 2* pages 309–310
- **Home Link:** 8-12

Assessment: Students list guidelines for solving cryptarithms and solve puzzles. Expect students to be able to apply their understanding of trading and the properties of addition and subtraction to find 1s in the greatest place values of the sums in Problems 1 and 2, and the minuend (top number) in Problems 3 and 4 on journal page 309. GMP7.2 Some students may be able to find all of the digits with minimal assistance. See suggestions in the Adjusting the Activity note for students who continue to struggle trying to solve the puzzles.

Differentiation Options:

- **Readiness:** Reviewing Addition and Subtraction Algorithms
- **Enrichment:** Writing Cryptarithms
- **Extra Practice:** Solving Cryptarithms
- **Activity Cards:** 97–98
- **ELL Support:** Display various kinds of puzzles, such as crossword puzzles, jigsaw puzzles, tangram puzzles, and number puzzles. Label and name the different kinds of puzzles, highlighting the word *puzzle* so that students can see that puzzles come in different forms, with different ways to solve them.

Lesson 8-13 Many Names for Numbers

Standards: 4.NBT.4 , 4.NBT.5 , 4.NBT.6, 4.NF.1 , 4.NF.5 , 4.NF.5

Warm Up/Mental Math: Students add pairs of mixed numbers with respective denominators 10 and 100.

Focus: Math Message: Students find equivalent names for a number. *Write on your slate as many names as you can for the number* 63/4. *Try to use the four operations, +, –, ∗, and ÷, and what you know about fractions and decimals. Draw a star next to your favorite name.*

Practice: Students find equivalent names for a number.

- **Games: Playing *Name That Number* Game** Students explore representing numbers in different ways by using the four operations. Students play *Name That Number* to practice representing numbers in different ways. Display the cards 16, 10, 7, 2, 8, and 5. Point to the 16 card, designating it as the target number. Explain that the object of the game is to match the target number by adding, subtracting, multiplying, or dividing as many of the other numbers as possible. Each number may be used only once. Give students time to work and then call for possible solutions. GMP1.3 Ask questions like these:
  - Did anyone find a solution using three cards? Sample answer: 10 + 8 – 2 = 16
  - Did anyone find a solution using four cards? Sample answer: 7 ∗ 2 + 10 – 8 = 16
  - Did anyone find a solution using all five cards? GMP1.5 Sample answer: 8 / 2 + 10 + 7 – 5 = 16
  - Have students play *Name That Number*. GMP6.4 Consider having them record rounds of play on *Math Masters,* page G49.
  - For additional information about the game, see *Student Reference Book,* page 268.
  - Observe: Which students are consistently able to use 4 or 5 cards to reach the target number? Which students are using all 4 operations during their play?
  - Discuss: What are some strategies that help you use the most cards? How might you play this game with decimals or fractions?
- **Math Boxes:** *Math Journal 2* pages 311–312
- **Home Link:** 8-13

Assessment: **Students consider various ways to name whole numbers, fractions, and decimals.** Most students should be able to write equivalent names for 9,873 using both multi-digit multiplication and division when completing Problem 1 on journal page 311. Watch for students who write simple names using just addition and subtraction. Provide them with a few more complex sample answers as a guide. Challenge students who excel to create their own name-collection box, with one student

putting a name on the box and recording correct and incorrect answers and a partner then crossing out the incorrect answers.

Differentiation Options:

- **Readiness:** Using a Broken Calculator
- **Enrichment:** Reaching Target Numbers
- **Extra Practice:** Solving a Broken Calculator Dilemma
- **Activity Cards:** 99–100
- **ELL Support:** Display the words *name* and *named* and help students identify the base word using sentences like these: *I gave my dog the name Nugget because she is a small dog. I named her Nugget.* Point out that in the first sentence the word *name* is used to indicate something, while in the second sentence *named* is used to depict an action.

Lesson 8-14 Assessment (2-day lesson)

- **Warm Up/Self-Assessment: C**omplete the Self-Assessment.
- **Unit 8 Assessment -** These items reflect mastery expectations to this point
- **Unit 8 Challenge (Optional) -** Students may demonstrate progress beyond expectations
- **Solving the Open Response Problem & Discussing the Problem:** The class discusses students' explanations
- **Look Ahead:**
  - **Math Boxes 8-14**
  - **Home Link 8-14**
- **Differentiation Options:**
  - See TE for adjustments to the assessment

Progress Check: End-of-Year Assessment

The End-of-Year Assessment covers some of the important concepts and skills presented in *Fourth Grade Everyday Mathematics.* It should be used to complement the ongoing and periodic assessments that appear within lessons and at the end of each unit.

This assessment provides a final opportunity to check students' understanding of the concepts and skills presented in *Fourth Grade Everyday Mathematics.*

In Progress Check Lessons, differentiation suggestions, including adaptations for each item and challenge items, are embedded throughout, so separate Readiness, Extra Practice, and Enrichment activities are not included.

Student Resources	
Print	Student Math Journal Volume 2
Print	Student Reference Book
Print/Online	Activity Cards
Print/Online	EM Games Online

Teacher Resources	
Print	Teacher's Lesson Guide Volume 2
Print/Online	Spiral Tracker
Print/Online	Math Masters
Print/Online Online **Literature Link** Online Online Online Online	Assessment Handbook eToolkit ***Sideways Arithmetic from Wayside School*** **by Louis Sachar (optional)** https://learnzillion.com www.mathgoodies.com www.commoncoreconversation.com https://grade4commoncoremath.wikispaces.hcpss.org/

ACCOMMODATIONS AND MODIFICATIONS
Below please find a list of suggestions for accommodations and modifications to meet the diverse needs of our students. Teachers should consider this a resource and understand that they are not limited to the recommendations included below.

An **accommodation** *changes* HOW *a student learns*; the change needed does not alter the grade-level standard. A **modification** *changes* WHAT *a student learns*; the change alters the grade-level expectation.

Special Education and 504 Plans
All modifications and accommodations must be specific to each individual child's IEP (Individualized Educational Plan) or 504 Plan.

- Pre-teach or preview vocabulary
- Repeat or reword directions
- Have students repeat directions
- Use of small group instruction
- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments
- Repetition and time for additional practice
- Model skills/techniques to be mastered
- Extended time to complete task/assignment/work
- Provide a copy of class notes
- Strategic seating (with a purpose - eg. less distraction)
- Flexible seating
- Repetition and additional practice
- Use of manipulatives
- Use of assistive technology (as appropriate)
- Assign a peer buddy
- Emphasize key words or critical information by highlighting
- Use of graphic organizers
- Scaffold with prompts for sentence starters
- Check for understanding with more frequency
- Provide oral reminders and check student work during independent practice
- Chunk the assignment - broken up into smaller units, work submitted in phases
- Encourage student to proofread assignments and tests
- Provide regular home/school communication
- Teacher checks student planner
- Provide student with clear expectations in writing and grading criteria for assignments (rubrics)

Testing Accommodations:
Students should receive all testing accommodations for Benchmark assessments that they receive for State testing.

- Setting: Alternate setting for assessments, small groups, screens to block distractions
- Presentation: large print, test readers, use of audio, fewer questions on each page
- Response: answer verbally, use large block answer sheet, speech-to-text dictation, accept short answers
- Allow for retakes
- Provide study guides
- Use of reference aids such as glossary, multiplication tables, calculator
- Choice of test format (multiple-choice, essay, true-false)
- Alternate ways to evaluate (projects or oral presentations instead of written tests)
- Open-book or open-note tests

English Language Learners:
All modifications and accommodations should be specific to each individual child's LEP level as determined by the WIDA screening or ACCESS, utilizing the WIDA Can Do Descriptors.

- Pre-teach or preview vocabulary
- Repeat or reword directions
- Have students repeat directions
- Use of small group instruction
- Scaffold language based on their Can Do Descriptors
- Alter materials and requirements according to Can Do Descriptors
- Adjust number of paragraphs or length of writing according to their Can Do Descriptor
- TPR (Total Physical Response-Sheltered Instruction strategy) Demonstrate concepts through multi sensory forms such as with body language, intonation
- Pair visual prompts with verbal presentations
- Repetition and additional practice
- Model skills and techniques to be mastered
- Native Language translation (peer, assistive technology, bilingual dictionary)
- Emphasize key words or critical information by highlighting
- Use of graphic organizers
- Scaffold with prompts for sentence starters
- Check for understanding with more frequency
- Use of self-assessment rubrics
- Increase one-on-one conferencing; frequent check ins
- Use study guide to organize materials
- Make vocabulary words available in a student created vocabulary notebook, vocabulary bank, Word Wall, or vocabulary ring
- Extended time
- Select text complexity and tiered vocabulary according to Can Do Descriptors
- Projects completed individually or with partners
- Use online dictionary that includes images for words: http://visual.merriamwebster.com/.

- Use online translator to assist students with pronunciation: http://www.reverso.net/text_translation.aspx?lang=EN.

Students at Risk of Failure:

- Use of self-assessment rubrics for check-in
- Pair visual prompts with verbal presentations
- Ask students to restate information and/or directions
- Opportunity for repetition and additional practice
- Model skills/techniques to be mastered
- Extended time
- Provide copy of class notes
- Strategic seating with a purpose
- Provide students opportunity to make corrections and/or explain their answers
- Support organizational skills
- Check daily planner
- Encourage student to proofread work
- Assign a peer buddy
- Build on students' strengths based on Multiple Intelligences: Linguistic (verbal); Logical (reasoning); Musical/Rhythmic; Intrapersonal Intelligence (understanding of self); Visual Spatial Intelligence; Interpersonal Intelligence (the ability to interact with others effectively); Kinesthetic (bodily); Naturalist Intelligence; and Learning Styles: Visual; Auditory; Tactile; Kinesthetic; Verbal

High Achieving:

Extension Activities

- Allow for student choice from a menu of differentiated outcomes; choices grouped by complexity of thinking skills; variety of options enable students to work in the mode that most interests them
- Allow students to pursue independent projects based on their individual interests
- Provide enrichment activities that include more complex material
- Allow opportunities for peer collaboration and team-teaching
- Set individual goals
- Conduct research and provide presentation of appropriate topics
- Provide students opportunity to design surveys to generate and analyze data to be used in discussion
- Allow students to move through the assignment at their own pace (as appropriate)

Strategies to Differentiate to Meet the Needs of a Diverse Learning Population

- Vocabulary Sorts-students engage with the vocabulary word by sorting into groups of similar/different rather than memorizing definitions
- Provide "Realia" (real life objects to relate to the five senses) and ask questions relating to the senses
- Role Play-students create or participate in role playing situations or Reader's Theater

- Moving Circle-an inside and outside circle partner and discuss, circles moves to new partner (Refer to Kagan Differentiated Strategies)
- Brainstorm Carousel-Large Post Its around the room, group moves in a carousel to music. Group discusses topic and responses on paper. Groups rotate twice to see comments of others. (Refer to Kagan Differentiated Strategies)
- Gallery Walk-Objects, books, or student work is displayed. Students examine artifacts and rotate.
- Chunking-chunk reading, tests, questions, homework, etc to focus on particular elements.
- Think Pair Share Write
- Think Talk Write
- Think Pair Share
- Note-taking -can be done through words, pictures, phrases, and sentences depending on level
- KWL (Know, Want to Know, Learned)/KWHL(Know, What to Know, How Will I Learn, learned)/KWLS (Know, Want to Know, Learned, Still Want to Know) /KWLQ (Know, What to Know, Learned, Questions I Still Have) Charts
- Corners Cooperative Learning Strategy: http://cooperativelearningstrategies.pbworks.com/w/page/28234420/Corners.
- Circle Map strategy- place the main topic in a small circle and add student ideas in a bigger circle around the topic. Students may use their native language with peers to brainstorm.
- Flexible grouping -as a whole class, a small group, or with a partner, temporary groups are created: http://www.teachhub.com/flexible-grouping-differentiated-instruction-strategy.
- Jigsaw Activities -cooperative learning in a group, each group member is responsible for becoming an "expert" on one section of the assigned material and then "teaching" it to the other members of the team: http://www.adlit.org/strategies/22371/.

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