Marietta City Schools

2023–2024 District Unit Planner

Accelerated Grade 6/7 Mathematics

Unit title	Unit 3: Making Relevant Connections within and through The Number System	**MYP year**	*1*	**Unit duration (hrs)**	*30 hours total*

Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): ***What will students learn?***

GA DoE Standards

Standards

6.NR.1: Solve relevant, mathematical problems involving operations with whole numbers, fractions, and decimal numbers.

7.NR.1 Solve relevant, mathematical problems, including multi-step problems, involving the four operations with rational numbers and quantities in any form (integers, percentages, fractions, and decimal numbers)

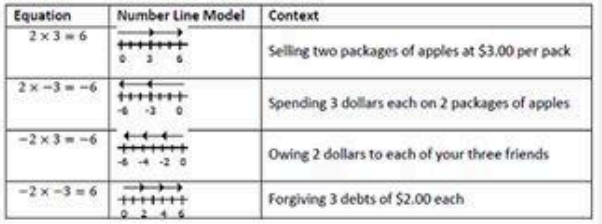
6.MP: Display perseverance and patience in problem-solving. Demonstrate skills and strategies needed to succeed in mathematics, including critical thinking, reasoning, and effective collaboration and expression. Seek help and apply feedback. Set and monitor goals.
MCS.Gifted.S3C. Use a variety of strategies for solving authentic, complex, real world problems through evaluative thinking and the engineering design processes.
MCS.Gifted.S4B Recognize and examine the value of others strengths, thoughts, ideas, and feelings during collaboration.
MCS.Gifted.S4D Respectfully collaborate and effectively communicate exchanges of constructive/critical feedback.
MCS.Gifted.S6 Students will become self-directed, independent learners.

Concepts/Skills to be Mastered by Students

Expectations		Evidence of Student Learning (not all inclusive; see Grade Level Overview for more details)			
6.NR.1.1	Fluently add and subtract any combination of fractions to solve problems.	***Terminology*** • Fluently/Fluency – Students choose flexibly among methods and strategies to solve mathematical problems accurately and efficiently.	***Strategies and Methods*** • Students should be able to use numerical reasoning to interpret applicable, mathematical situations involving fractions. • Students should be given the opportunity to apply reasoning strategies while solving problems. • Students may solve problems in different ways and have the flexibility to choose a mathematical strategy that allows them to make sense of and strategically solve problems using efficient methods that are most comfortable for and makes sense to them.	***Age/Developmentally Appropriate*** • Students should be allowed to choose an appropriate strategy to demonstrate fluency.	
6.NR.1.2	Multiply and divide any combination of whole numbers, fractions, and mixed numbers using a student-selected strategy. Interpret products and quotients of fractions and solve word problems.	***Strategies and Methods*** • Students should be able to utilize fractions with denominators including 2, 3, 4, 5, 6, 8, 10, and 12. • Students should be able to use numerical reasoning to interpret applicable, mathematical situations involving fractions. • Students can use a variety of strategies, including but not limited to concrete models, visual fraction models, student-generated strategies, a standard algorithm, or other strategies based on numerical reasoning to represent and solve problems. • Students should be given the opportunity to apply reasoning strategies and use written methods that make sense to them. • Students should use flexible, accurate, and efficient written methods to express computational thinking based on numerical reasoning and sense-making developed from learning experiences that focus on the numbers as quantities. • Students may solve problems in different ways and have the flexibility to choose a mathematical strategy that allows them to make sense of and strategically solve problems using efficient methods that are most comfortable for and makes sense to them.	***Fundamentals*** • Students should use their understanding of equivalency to flexibly reason with equivalent fractions based on the context of the problem. Simplifying fractions is not an expectation of this grade level. • Students should be able to use the meanings of fractions, multiplication, division and the inverse relationship between multiplication and division to make sense of multiplying and dividing fractions.	***Example*** • How many $\frac{3}{4}$-cup servings are in $\frac{2}{3}$ of a cup of yogurt?

6.NR.1.3	Perform operations with multi-digit decimal numbers fluently using models and student-selected strategies.	***Fundamentals*** • Fluently/Fluency – Students choose flexibly among methods and strategies to solve mathematical problems accurately and efficiently.	***Strategies and Methods*** • Students should be able to use a variety of part-whole strategies to compute efficiently (area model, partial product, partial quotient). • The part-whole strategies used should be flexible and extend from previous computation strategies and future work with computation. • Students should use models and student-selected strategies as an efficient written method of demonstrating place value understanding for each operation (addition, subtraction, multiplication, and division). • Students may solve problems in different ways and have the flexibility to choose a mathematical strategy that allows them to make sense of and strategically solve problems using efficient methods that are most comfortable for and makes sense to them.	***Terminology*** • Decimal number – a number whose whole number part and fractional part are separated by a decimal point.

Expectations		Evidence of Student Learning (not all inclusive; see Grade Level Overview for more details)			
7.NR.1.1	Show that a number and its opposite have a sum of 0 (are additive inverses). Describe situations in which opposite quantities combine to make 0.	***Terminology*** • In the equation 3 + −3 = 0, 3 and −3 are additive inverses of each other.	***Example*** • Your bank account balance is − $25.00. You deposit $25.00 into your account. The net balance is $0.00.		
7.NR.1.2	Show and explain p + q as the number located a distance |q| from p, in the positive or negative direction, depending on whether q is positive or negative. Interpret sums of rational numbers by describing applicable situations.	***Strategies and Methods*** • Students should be able to add and subtract integers and other rational numbers presented within relevant, mathematical problems, using strategic thinking and a variety of tools.	***Example*** • 6 + (− 4) is 4 units to the left of 6 on a horizontal number line or 4 units down from 6 on a vertical number line.		
7.NR.1.3	Represent addition and subtraction with rational numbers on a horizontal or a vertical number line diagram to solve authentic problems.	***Strategies and Methods*** • Students should represent a variety of types of rational numbers on a number line diagram presented both horizontally and vertically.			
7.NR.1.4	Show and explain subtraction of rational numbers as adding the additive inverse, p – q = p + (–q). Show that the distance between two rational numbers on the number line is the absolute value of their difference and apply this principle in contextual situations.	***Examples*** • Find the distance between a submarine submerged at a depth of $27\frac{3}{4}$ feet below sea level and an airplane flying at an altitude of $1262\frac{1}{2}$ feet above sea level. • $-\frac{1}{2}-(-2)$ is the same expression as $-\frac{1}{2}+-(-2)$, which is 2 units to the right of $-\frac{1}{2}$ on a horizontal number line or 2 units up from $-\frac{1}{2}$ on a vertical number line.			
7.NR.1.5	Apply properties of operations, including part-whole reasoning, as strategies to add and subtract rational numbers.	***Fundamentals*** • Students should be allowed to explore the signs of integers and what they really mean to discover integer rules.	***Strategies and Methods*** • Students should be able to use the Commutative and Associative properties to combine more than two rational numbers flexibly.	***Terminology*** • Part-whole reasoning refers to how numbers can be split into parts to add and subtract numbers more efficiently.	***Example*** • (–8) + 5 + (–2) may be solved as (–8) +(–2) + 5 to first make –10 by using the Commutative Property.

7.NR.1.6	Make sense of multiplication of rational numbers using realistic applications.	***Strategies and Methods*** • Student should have opportunities to use concepts of repeated addition and the meaning of a negative sign as the "opposite of," with both models and representations, leading to deriving the rules for multiplying signed numbers. • Models may include, but are not limited to, number lines and counters.	**Examples** • 4 * (–5) is 4 groups of (–5) and (–4) * (–3) is the opposite of 4 * (–3). • If yellow counters represent positive amounts and red counters represent negative amounts, you can model 3 * (–2) as three groups of two red counters. • David has a $0.00 balance in his bank account. He makes three withdrawals of $1.46 each. What is his bank account balance after the three withdrawals?
7.NR.1.7	Show and explain that integers can be divided, assuming the divisor is not zero, and every quotient of integers is a rational number.	***Fundamentals*** • If p and q are integers (q ≠ 0), then $-\left(\frac{p}{q}\right) = \frac{(-p)}{q} = \frac{p}{(-q)}$.	***Example*** • $-\left(\frac{20}{5}\right) = -4$ is the same as $\frac{(-20)}{5} = -4$ and $\frac{20}{(-5)} = -4$
7.NR.1.8	Represent the multiplication and division of integers using a variety of strategies and interpret products and quotients of rational numbers by describing them based on the relevant situation.	***Fundamentals*** • Students should be allowed to explore the signs of integers and what they really mean to discover integer rules. ***Strategies and Methods*** • Students can represent multiplication and division using number lines, counters, etc.	***Example*** • Create a model and realistic situations for each of the products. Write and model the family of equations related to 2 × 3 = 6.  Equation / Number Line Model / Context 2 × 3 = 6 — Selling two packages of apples at $3.00 per pack 2 × −3 = −6 — Spending 3 dollars each on 2 packages of apples −2 × 3 = −6 — Owing 2 dollars to each of your three friends −2 × −3 = 6 — Forgiving 3 debts of $2.00 each
7.NR.1.9	Apply properties of operations as strategies to solve multiplication and division problems involving rational numbers represented in an applicable scenario.	***Fundamentals*** • Students should be allowed to explore the signs of integers and what they really mean to discover integer rules. • Students should be able to reason about direction on a number line when representing multiplication and division using the tool.	***Strategies and Methods*** • Students should be able to use the Commutative and Associative properties to combine more than two rational numbers flexibly. ***Example*** • (– 8) * 2 * (–5) may be solved as (– 8) * (2*(–5)) to multiply by negative ten, using the Associative Property.
7.NR.1.10	Convert rational numbers between forms to include fractions, decimal numbers and percentages, using understanding of the part divided by the whole. Know that the decimal form of a rational number terminates in 0s or eventually repeats.	***Fundamentals*** • This is an extension of previous understanding from 6th grade of writing common fractions as decimal numbers and percentages.	***Age/Developmentally Appropriate*** • Students should know that every rational number can be written as the ratio of two integers, terminating decimal numbers, or repeating decimal numbers.

7.NR.1.11	Solve multi-step, contextual problems involving rational numbers, converting between forms as appropriate, and assessing the reasonableness of answers using mental computation and estimation strategies.	***Example*** • If Sara makes $25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or $2.50, for a new salary of $27.50.

Vocabulary:

K-12 Mathematics Glossary

Additive Inverse	Negative Numbers	Multiplicative Inverse	Opposite Numbers	Absolute Value	Positive Numbers	Product
Integers	Rational Numbers	Long Division	Repeating Decimal	Natural Numbers	Terminating Decimal	Sum
Zero Pair	Algorithm	Difference	Measurement Model of Division	Quotient	Dividend	Median
Subtrahend	Reciprocal	Divisor	Multiple	Skewed Data	Factor	Partitive Model of Divisions
Mean						

Key concept	Related concept(s)	Global context
Relationships The connections and associations between properties, objects, people and ideas. **Logic** A method of reasoning and a system of principles used to build arguments and reach conclusion	**Model, Representation**	**Identity and Relationships** **Globalization and Sustainability**

Statement of inquiry

Mathematical models can help people represent real world relationships using operations with rational numbers.

Inquiry questions
Factual: What are the steps to converting a rational number to a repeating or terminating decimal? What is a rational number? What is the difference between positive and negative numbers? What is absolute value? What is the additive inverse of a given number? **Conceptual**: How can something be less than nothing? How can operations with positive and negative numbers be represented using models, such as number lines and counters? **Debatable**: What strategies are most useful in helping develop algorithms for adding, subtracting, multiplying, and dividing positive and negative rational numbers?

MYP Objectives	**Assessment Tasks**	
*What specific MYP **objectives** will be addressed during this unit?*	***Relationship** between summative assessment task(s) and statement of inquiry:*	*List of common formative and summative assessments.*

	Students will be expected to represent real world relationships using models that involve operations with rational numbers. Students will be expected to utilize properties of rational numbers to correctly model, solve and interpret solutions to real-world situations.	**Formative Assessment(s):** **Summative Assessment(s):** Unit 3 CSA Unit 3 Summative

Approaches to learning (ATL)

Category: Thinking
Cluster: Critical Thinking, Creative Thinking and Transfer
Skill Indicator: Apply skills and knowledge in unfamiliar situations.

Category: Social
Cluster: Collaboration Skills
Skill Indicator: Give and receive meaningful feedback.

Learning Experiences Add additional rows below as needed.		
Objective or Content	**Learning Experiences**	**Personalized Learning and Differentiation**
6.NR.1.2 Multiply and divide any combination of whole numbers, fractions, and mixed numbers using a student-selected strategy. Interpret products and quotients of fractions and solve word problems.	**Exploring Mixed Number Division** In this learning plan, students will explore dividing fractions by representing various expressions and looking for patterns in repeated reasoning. The learning goals are: 1. I can apply what I know about division of whole numbers to divide fractions and mixed numbers. 2. I can use various strategies to divide fractions and mixed numbers.	To support learning, make fraction materials available to students to represent the situations within each task. To extend learning, encourage students to apply strategies discovered when dividing a fraction by fraction to dividing fractions and mixed numbers.
Content Resources		
6-11 Savvas Correlation to 2021 standards **GaDoe Intervention Table of Tasks/Activities** **Additional Resources** ● **Savvas** ● **Desmos** ● **Hands-On Math**		

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