Integers and Rational Numbers

Content Area: **Math**
Course(s):
Time Period: **MP1**
Length: **45**
Status: **Published**

Unit Overview

Unit Summary	Unit Rationale
In Unit 1, students will apply and extend previous understandings of multiplication and division to divide fractions by fractions. Students will compute fluently multi-digit numbers and find common factors and multiples. Also, students will apply and extend previous understandings of numbers to the system of rational numbers	Unit 1 builds students procedural skill and fluency related to integers and rational numbers. In this unit students also develop conceptual understanding related to these topics. These are key foundational skills that have real world application. It will be important for students to work fluently with positive and negative real numbers through out their academic careers and in their non-academic lives.

NJSLS

MATH.6.NS.B.2	With accuracy and efficiency, divide multi-digit numbers using the standard algorithm.
MATH.6.NS.B.3	With accuracy and efficiency, add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
MATH.6.NS.C.5	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
MATH.6.NS.C.6.a	Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite.
MATH.6.NS.C.6.b	Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
MATH.6.NS.C.7.a	Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.
MATH.6.NS.C.7.b	Write, interpret, and explain statements of order for rational numbers in real-world

	contexts.
MATH.6.NS.C.7.d	Distinguish comparisons of absolute value from statements about order.
MATH.6.NS.C.8	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Standards for Mathematical Practice

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning

Unit Focus

Enduring Understandings	Essential Questions
• Algorithms can be used to add, subtract, multiply and divide decimals fluently. • Visual models and equations can be used to multiply and divide fractions. • Multi-step problems require students to carefully plan the steps they follow to find the solution. Integers are the counting numbers, their opposites and 0. • Integers can be compared ordered and used to describe real world content • Each rational number can be associated with a unique point on the number line. • A number to the right of another on the number line is the greater number. • The absolute value of a number can be described as the distance from 0 on a number line. • Absolute value can be interpreted as the magnitude of a positive or negative quantity in a real world situation. • A coordinate plane is formed by a horizontal number line, the x-axis, and a vertical number line, the y-axis, that intersect at a point called the origin. • An ordered pair(x,y) locates a point on the coordinate plane. • The distance between two points on the	• How can you fluently add, subtract, multiply, and divide decimals? • How can you multiply and divide fractions? • How do you know which operation to choose when solving a real-life problem? • How can you use repeated factors in real life situations? • What is the effect of inserting parentheses into a numerical expression? • Without dividing, how can you tell when a number is divisible by another number? • How can you find the greatest common factor of two numbers? • How can you simplify an algebraic expression? • How can you use algebra tiles to add or subtract algebraic expressions? • How can you use addition, subtraction multiplication or division to solve equations?

coordinate plane with the same first coordinate or the same second coordinate can be found by adding or subtracting the absolute values of the coordinates that differ. • The coordinates of the vertices of a polygon on the coordinate plane can be used to find the lengths of the sides of the polygon and its perimeter	

Instructional Focus

Learning Targets
● Fluently add, subtract, and multiply decimals ● Fluently divide whole numbers and decimals ● Use models to multiply fractions ● Use models to divide with fractions Use equations to divide with fractions ● Use models to divide fractions by fractions Use an algorithm to divide fractions by fractions ● Divide with mixed numbers ● Solve Multistep problems with Fractions and Decimals ● Identify opposites of integers Compare and order rational numbers ● Plot rational numbers on a number line Compare and order rational numbers ● Use absolute value to represent a number's distance from zero Interpret absolute value in real-world situations ● Identify and graph points with rational coordinates on the coordinate plane Reflect points with rational coordinates across both axes ● Use absolute value to find the distance between 2 -points on the same horizontal or vertical line on a coordinate plane ● Find side lengths and perimeter of polygons on the coordinate plane
Prerequisite Skills
• Fluently add, subtract, multiply and divide positive rational numbers.

• Multiplying and dividing fractions. • Order positive rational numbers on a number line. • Graph ordered pairs in Quadrant I.
Common Misconceptions
Students may have trouble moving from the model for division and the standard algorithm. Students may misunderstand the context of a graph. They may believe that the coordinates moving up/down/left/right means that the context of the graph is also physically moving. Students may not understand the importance of consistent intervals on a graph or number line.

Spiraling For Mastery

Current Unit Content/Skills	Spiral Focus	Activity
• Integers • Rational Numbers • Coordinate Grid	• add, subtract, multiply, and divide decimals • multiply and divide fractions • rational numbers • graph points on the coordinate plane (first quadrant)	Math Diagnostic and Intervention System (MDIS)

Assessment

Formative Assessment	Summative Assessment
• Homework • Lesson Checks • MathXL • Quizzes • Exit Tickets • Lesson Reflections • Performance Tasks	• Topic Tests • Unit 1 Benchmark (Link-It)

Resources

Key Resources	Supplemental Resources
Savvas EnVision Grade 6 Pacing Guide	• IXL • Delta Math • Desmos • Khan Academy

Career Readiness, Life Literacies, and Key Skills

CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.

Interdisciplinary Connections

ELA.L.KL.6.2.A	Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases.
ELA.SL.PE.6.1.A	Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.
ELA.SL.PE.6.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.
ELA.SL.PE.6.1.C	Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.
6-8.MS-ETS1-3.4.1	Analyze and interpret data to determine similarities and differences in findings.
6-8.MS-ETS1-3.ETS1.B.1	There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem.