Number System: Grade 6

Stage 1 Desired Results

ESTABLISHED GOALS:

Competencies:

- ***Students will demonstrate the ability to apply number sense by ordering and determining the magnitude of rational numbers.***
- ***Students will demonstrate the ability to simplify numeric and algebraic expressions by applying the properties of operations and the arithmetic of real numbers.***
- ***Students will demonstrate the ability to solve equations and inequalities by applying the properties of equality, inequality and rational expressions.***
- ***Students will demonstrate the ability to model real world problems by building and analyzing the appropriate expression, equation, or function.***
- ***Students will demonstrate the ability to analyze and summarize text and integrate knowledge to make meaning of discipline-specific materials.***
- ***Students will demonstrate the ability to produce coherent and supported writing in order to communicate effectively for a range of discipline-specific tasks, purposes, and audiences.***
- ***Students will demonstrate the ability to speak purposefully and effectively by strategically making decisions about content, language use, and discourse style.***

Content Standards:

- 6.NS.A.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.
- 6.NS.B.2 Fluently divide multi-digit numbers using the standard algorithm.
- 6.NS.B.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
- 6.NS.B.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor
- 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.
- 6.NS.C.6 Understand a rational number as a point on the number

Transfer

*Students will be able to independently use their learning to **compute accurately and fluently with common number representations.***

Meaning

ENDURING UNDERSTANDINGS

Students will understand that…

- that numbers are compared and ordered based upon their magnitude and sign.
- using standard algorithms leads to efficient computing with numbers.
- their prior knowledge of operations involving positive rational numbers can also be applied to all rational numbers.

ESSENTIAL QUESTIONS

- Why do some things need more than one name?
- How would we describe the world around us without negatives?

Acquisition

Students will know…

- *the inverse operations for all four operations.*
- *the algorithms for operating with fractions and decimals.*
- *the long division algorithm.*
- *the distributive property.*
- *that integers, fractions, and decimals can simultaneously be graphed on a number line*
- *the absolute value of a number is its distance from zero.*

vocabulary: common factor, common multiple, algorithm, least common multiple, greatest common factor, distributive property, absolute value, magnitude, inverse operations

Students will be skilled at…

- *dividing multi-digit numbers fluently using the standard algorithm.*
- *fluently adding, subtracting, multiplying and dividing fractions and multi-digit decimals using algorithms.*
- *determining the GCF and LCM of two numbers*
- *solving a problem by using the GCF and LCM of two numbers.*
- *applying the distributive property to rewrite the sum of two whole numbers.*
- *applying the distributive property to simplify expressions*
- *finding the absolute value of and ordering rational numbers.*
- *using positive and negative numbers to represent quantities in real-world situations.*
- *solving word problems involving operations with fractions and decimals.*
- *interpreting inequalities with positive and negative integers.*

line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. o 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. o Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane. • 6.NS.C.7 Understand ordering and absolute value of rational numbers. o Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example ,interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right. o Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write –3 ° C > –7 ° C to express the fact that –3 ° C is warmer than –7 ° C. o Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars. o Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars. • MP1 Make sense of problems and persevere in solving them. • MP2 Reason abstractly and quantitatively. • MP3 Construct viable arguments and critique the reasoning of others. • MP6 Attend to precision. • MP7 Look for and make use of structure. • MP8 Look for and express regularity in repeated reasoning.		
Content Area Literacy Standards		***21st Century Skills***
• RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. • RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*. • RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually.		• *reason effectively* • *collaborate with others* • *use systems thinking* • *solve problems* • *communicate clearly*

Stage 2 - Evidence

Evaluative Criteria	***Assessment Evidence***
	PERFORMANCE TASK(S):

	OTHER EVIDENCE:

Stage 3 – Learning Plan

Summary of Key Learning Events and Instruction

Language Arts Integration	***Mathematics Integration***
• 1.OA.1 Use	• 1.OA.1 Use
Technology Integration	***District Materials***
• 1.OA.1 Use	