



Topic B:

Multiplication and Division of Integers and Rational Numbers

7.NS.A.2

Focus Standard:	7.NS.A.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. - Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. - Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts. - Apply properties of operations as strategies to multiply and divide rational numbers. - Convert a rational number to a decimal number using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
Instructional Days:	7	
	Lesson 10:	Understanding Multiplication of Integers (P) ¹
	Lesson 11:	Develop Rules for Multiplying Signed Numbers (P)
	Lesson 12:	Division of Integers (P)
	Lesson 13:	Converting Between Fractions and Decimals Using Equivalent Fractions (P)
	Lesson 14:	Converting Rational Numbers to Decimals Using Long Division (P)
	Lesson 15:	Multiplication and Division of Rational Numbers (P)
	Lesson 16:	Applying the Properties of Operations to Multiply and Divide Rational Numbers (S)

¹ Lesson Structure Key: **P**-Problem Set Lesson, **M**-Modeling Cycle Lesson, **E**-Exploration Lesson, **S**-Socratic Lesson

In Topic B, students extend their understanding of multiplication and division of whole numbers, decimals, and fractions to find the products and quotients of signed numbers (**7.NS.A.2**). Students begin in Lesson 10 by returning to conceptualization of multiplication as repeated addition. They relate multiplication to the Integer Game. For instance, gaining four -5 cards, or $4(-5)$, is the same as $0 + (-5) + (-5) + (-5) + (-5)$, which is the same as $0 - 5 - 5 - 5 - 5$, or -20 . They realize that if a negative card is taken out of their hand multiple times, their score goes up, for example, $(-2)(-6) = 0 - (-6) - (-6) = 0 + 6 + 6 = 12$. In Lesson 11, students draw upon their experiences with the integer card game to justify the rules for multiplication of integers. The additive inverse (**7.NS.A.1c**) and distributive property are used to show that $(-1)(-1) = 1$ (**7.NS.A.2a**).

From earlier grades, students understand division as the process of finding the missing factor of a product (**3.OA.B.6**). In Lesson 12, they use this relationship to justify that the rules for dividing signed numbers are consistent with that of multiplication, provided the divisor is not zero (**7.NS.A.2b**). Students extend the integer rules to include all rational numbers, recognizing that every quotient of two integers is a rational number provided the divisor is not zero.

In Lesson 13, students realize that the context of a word problem often determines whether the answer should be expressed in the fractional or decimal form of a rational number. They draw upon their previous understanding of equivalent fractions, place value, and powers of ten to convert fractions whose denominators are a product of 2s and 5s into decimals. In Lesson 14, students use long division to convert any fraction into a decimal that either terminates in zeros or repeats (**7.NS.A.2d**). Products and quotients continue to be related to the real world. In Lesson 15, students create numerical expressions with rational numbers based on the context of word problems. In Lesson 16, properties of operations are used to rewrite expressions in equivalent forms as students multiply and divide rational numbers efficiently without the aid of a calculator (**7.NS.A.2c**).