Grade: 7 FCPS 2025-2026 Math Grade 7 Topic 1

7th Grade Topic 1 : Rational Number Operations	Estimate Time Frame: 26 days
Essential Standards: 7.NS.1, 7.NS.2 Supporting Standards: 7.NS.3 Assessment Resource: enVision Topic 1 and Formative Assessment Lesson **(FAL)** Options: Using Positive and Negative Numbers in Context and Adding and Subtracting Directed Numbers	

FCPS Supporting Links	Additional Supporting Links
Pacing Guide 7th Grade Topic 1 Standards Resource with Sample Formative Assessments enVision 7th Grade Topic 1 Standards Crosswalk Resource FCPS P-12 Mathematics Guidance Document FCPS Achievement & Trauma-Informed Strategies in the Classroom	Kentucky Academic Standards KSA Blueprint Target of the Standards - conceptual, procedural & application Three-Reads Routine Notice and Wonder Routine **MILC Resources Topic 1: Integers and Rational Number Operations** ***enVision Teacher Guide: page 2A to 2D for specific Topic 1 Focus-Coherence-Rigor***

Big Ideas
Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

Essential Questions	Common Preconceptions/Misconceptions
How do operations with integers relate to the same operations with rational numbers? How can you determine the correct operation to use to solve problems? How do models help solve math problems?	Students may understand that one positive and one negative make zero but have difficulty understanding that this is also true for *all equal amounts* of positives and negatives, such as 5 positives and 5 negatives. One way to make this clear is to start with one positive and one negative counter. As soon as the student establishes that this is zero, add another pair. When the student

How does the ongoing use of fractions and decimals apply to real-life situations?	recognizes that you have just added another zero to the first zero, repeat. Repeat until the student has developed the concept.	
Standards for Mathematical Practices	**Kentucky Interdisciplinary Literacy Practices (KILP)**	
MP.1. Make sense of problems and persevere in solving them. **MP.2. Reason abstractly and quantitatively.** MP.3. Construct viable arguments and critique the reasoning of others. **MP.4. Model with mathematics.** MP.5. Use appropriate tools strategically. MP.6. Attend to precision. **MP.7. Look for and make use of structure.** **MP.8. Look for and express regularity in repeated reasoning.** ***enVision Teacher Guide: page 2E for specific Topic 1 Math Practice suggestions***	1. Recognize that text is anything that communicates a message. 2. Employ, develop, and refine schema to understand and create text. 3. View literacy experiences as transactional, interdisciplinary and transformational. 4. Utilize receptive and expressive language arts to better understand self, others, and the world. **5. Apply strategic practices, with scaffolding and then independently, to approach new literacy tasks.** **6. Collaborate with others to create new meaning.** **7. Utilize digital resources to learn and share with others.** **8. Engage in specialized, discipline-specific literacy practices.** **9. Apply high level cognitive processes to think deeply and critically about text.** 10. Develop a literacy identity that promotes lifelong learning. *Incorporating texts into math instruction fosters interdisciplinary learning for a more engaging educational experience.*	
Essential Standards	**Sample Learning Intentions & Success Criteria**	**HQIR/Resource Considerations**
Cluster: Apply and extend previous understandings of operations with fractions to add, subtract, multiply and divide rational numbers.		
KY.7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.	We are learning about the relationship between integers and their opposites. • I can model an opposite situation on a number line. • I can explain how an integer and its opposite are the same distance from 0.	• Topic 1 Lesson 1-1 • Brainingcamp Task (Lesson 1-1) "Let it Snow!" • Brainingcamp Task (Lesson 1-1) "Opposites Attract"

☒ **Conceptual** ☐ **Procedural** ❑ Application a. Describe situations in which opposite quantities combine to make 0. ☒ **Conceptual** ❑ Procedural ❑ Application **Clarifications:** For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged. b. Understand $p + q$ as the number located at a distance $\|q\|$ from p, in the positive or negative direction, depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. ☒ **Conceptual** ❑ Procedural ❑ Application **Clarifications:** The sum of numbers is a directional movement from one number to another for a specified amount of spaces on the number line. The sum of opposites is 0 because opposites have equivalent absolute values. c. Understand 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 real-world contexts. ☒ **Conceptual** ❑ Procedural ❑ Application	• I can describe the sum of an integer and its opposite as 0. We are learning to add rational numbers in mathematical and real-world contexts. • I can use a number line to model adding rational numbers. • I can use the additive inverse to add rational numbers. • I can choose the appropriate sign (+ or -) for the sum of rational numbers. We are learning to subtract rational numbers in mathematical and real-world contexts. • I can use a number line to model subtracting rational numbers. • I can use the additive inverse to subtract rational numbers. • I can choose the appropriate sign (+ or -) for the difference of rational numbers. We are learning to perform operations with rational numbers. • I can use properties of operations to add and subtract rational numbers. • I can use a number line to model adding and subtracting rational numbers. • I can use the additive inverse to subtract rational numbers. • I can choose the appropriate sign (+ or -) for the sum or difference of rational numbers.	• Topic 1 Lesson 1-3 • Topic 1: Let's Investigate! Sum Chips (replaces lesson 1-3) • Brainingcamp Task (Lesson 1-3) "When is Adding Removing?" • Topic 1 Lesson 1-4 • Topic 1: Let's Investigate! Subtraction Action (replaces lesson 1-4) • Brainingcamp Task (Lesson 1-4) "Subtraction Transformed" • Topic 1 Lesson 1-5 • Brainingcamp Task (Lesson 1-5) "Amazing Flying Fish" • enVision Language Support Handbook • Formative Assessment Lesson (FAL): Using Positive and Negative Numbers in Context • Formative Assessment Lesson (FAL): Adding and Subtracting Directed Numbers

Clarifications: Subtracting a positive number is the same as adding the positive number's opposite. d. Apply properties of operations as strategies to add and subtract rational numbers. ☐ **Conceptual** ☐ **Procedural** ❑ Application Coherence KY.6.NS.7→ KY.7.NS.1 **MP.2, MP.4, MP.7, KILP.1, KILP.2, KILP.10** *Supporting Standard: KY.7.NS.3*		
KY.7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. ☐ Conceptual ☐ Procedural ❑ Application a. 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. ☐ **Conceptual** ❑ Procedural ❑ Application **Clarifications:** Emphasis is on exploring and understanding how the rules for multiplying and dividing with negative numbers are connected to properties for the	We are learning to multiply integers. • I can use properties of operations to understand how to multiply integers. • I can explain how to multiply integers. • I can understand that the signs of the factors affect the signs of the product. We are learning to multiply with rational numbers. • I can describe a real-world context represented with multiplication of rational numbers. • I can multiply rational numbers. • I can interpret what the product means in a real-world context. • I can choose the appropriate sign for the product of rational numbers. We are learning to divide integers. • I can use properties of operations to	• Topic 1 Lesson 1-6 • Brainingcamp Task (Lesson 1-6) "A Very Jumpy Frog" • Topic 1 Lesson 1-7 • Topic 1 Lesson 1-8 • Brainingcamp Task (Lesson 1-8) "Can You Relate?" • Topic 1 Lesson 1-9 • 3-Act Math Topic 1: Win Some, Lose Some • Topic 1 Lesson 1-10 • enVision Language Support Handbook

operations, rather than thinking of them as arbitrary rules. They explain that 4 times (-3) could be four days of golfing 3 under par and, therefore, having an overall score of - 12. The remaining operations are based on applying properties. b. Understand that integers can be divided, provided that the divisor is not zero and every quotient of integers (with a 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. ☒ **Conceptual** ❑ Procedural ❑ Application **Clarifications:** Emphasis is on the equivalence relationship provided by the movement of one negative sign among the numerator, denominator, or in front of the entire fraction. c. Apply properties of operations as strategies to multiply and divide rational numbers. ☒ **Conceptual** ☒ **Procedural** ❑ Application Coherence KY.6.NS.1→ KY.7.NS.2 → KY.8.NS.1 **MP.2, MP.7, MP.8, KILP.1, KILP.2, KIP.5** *Supporting Standard: KY.7.NS.3*	understand how to divide integers. • I can explain how to divide integers. • I can choose the appropriate sign for the quotient. We are learning to divide rational numbers. • I can describe a real-world context represented with division of rational numbers. • I can interpret what the quotient means in a real-world context. • I can divide rational numbers. • I can use the multiplicative inverse (reciprocal) to divide rational numbers. • I can create equivalent fractions by moving the negative sign.	

Attending to the Standards for Mathematical Practice

In grade 7, students build upon understanding by examining inverses and reason any number has an additive inverse, which is the mirror-image of the original number, albeit on the opposite side of zero, which brings the idea of absolute value to life (MP.2). The structure of working with the various properties of rational numbers cannot be ignored and students systematically apply these properties in a variety of scenarios (MP.7). Understanding these properties gives students a tool to model many real-world situations with simpler mathematical sentences. Through the use of number lines, tape diagrams, expressions and equations, students model relationships

between rational numbers. Students relate operations involving integers to contextual examples (MP.4). Students demonstrate fluency in applying the four operations to rational numbers in real life situations when they strategically apply the properties of operations to model real-world situations and truly making sense of the world around them with mathematics. Additionally, as students fluently solve word problems, they consider their steps and determine whether or not they make sense in relationship to the arithmetic understanding that served as their foundation in earlier grades (MP.1, MP.2, MP.4, MP.5). Students move from recall of applying rules of multiplying and dividing signed numbers to the ability to apply these rules strategically in a variety of situations. Students formulate rules for operations with signed numbers by observing patterns (MP.2, MP.8).

Supporting Standards

KY.7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers. **MP.1, MP.2, MP.4**

❑ Conceptual ❑ **Procedural** ❑ **Application**

Vocabulary

absolute value – The distance of a number from zero.
additive inverse – Two numbers whose sum is 0. Example: 3/4 and -3/4 are additive inverses of one another because they equal 0.
Associative Property of Addition - A property for addition that means you can add three numbers in any order and get the same result; EX: 1+(2+3) = (1+2)+3; (3x4)x2 = 3(4x2); (a + b) + c = a + (b + c).
Associative Property of Multiplication – A property for multiplication that means you can multiply three numbers in any order and get the same result; EX: 1+(2+3) = (1+2)+3; (3x4)x2 = 3(4x2); (a x b) x c = a x (b x c).
Commutative Property of Addition – A property for addition that means you can add two numbers in any order and get the same result; EX: 50+25=25+50 and 3x4=4x3; a + b = b + a.
Commutative Property of Multiplication – A property for multiplication that means you can multiply two numbers in any order and get the same result; EX: 50+25=25+50 and 3x4=4x3; a x b = b x a.
integers – The set of numbers containing zero, the natural numbers, and all the negatives of the natural numbers. In other words, whole numbers and their opposites.
multiplicative inverse (reciprocal) - Two numbers whose product is 1.
subtract - Subtracting a number is the same as adding its opposite.

*Disclaimer: Success Criteria is the evidence students must produce to demonstrate learning. This example is not comprehensive.

** Mathematical Practices (A.MP.1- 8) should be evidenced at some point throughout each unit, depending on the explored tasks. It is important to note that MP. 2 should support learning in every lesson.

******* Modeling Standards: Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (★). The star symbol sometimes appears on the heading for a group of standards; in that case, it should be understood to apply to *all* standards in that group.