



Hattiesburg Public School District

Grade 7 Mathematics Units

2015 – 2016



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| Unit 1: Operations with Rational Numbers | Time Frame: 45 Days/Aug 10 – Oct 08, 2015 |
| Content Standards | Standards for Mathematical Practice |
| Major Standards | |
| <p>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.</p> <ul style="list-style-type: none"> a. Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged. b. Understand $p + q$ as the number located a distance q from p, in the positive or negative direction depending on whether q is positive or negative. 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. 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. d. Apply properties of operations as strategies to add and subtract rational numbers. <p>7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> (1) Make sense of problems and persevere in solving them. (2) Reason abstractly and quantitatively. (3) Construct viable arguments and critique the reasoning of others. (4) Model with mathematics. (5) Use appropriate tools strategically. (6) Attend to precision. (7) Look for and make use of structure. (8) Look for and express regularity in repeated reasoning. <p>7.NS.1 – MP: 2, 4, 7 7.NS.2 – MP: 2, 4, 7 7.NS.3 – MP: 1, 2, 5, 6, 7, 8 7.EE.2 – MP: 2, 6, 7, 8 7.EE.4a – MP: 1-8</p> |



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numbers by describing real-world contexts.

- b. 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.
- c. Apply properties of operations as strategies to multiply and divide rational numbers.
- d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.

7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers.

7.EE.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, $a + 0.05a = 1.05a$ means that “increase by 5%” is the same as “multiply by 1.05.”* (**Partial Introduction- referencing **numerical** expressions **only**)

7.EE.4a Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width? (**Partial Introduction- referencing **numerical** expressions, equations and inequalities **only**)



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Supporting Standards

Additional Standards

Pre-requisite Standards

7.NS.1 -

- Distinguish comparisons of absolute value from statements about order.
- Graph points on a number line.
- Understand that positive and negative numbers describe quantities that have opposite values or directions.
- Understand and interpret the absolute value of a number.

7.NS.2 -

- Interpret and compute quotients of fractions.
- Fluently divide multi-digit numbers using the standard algorithm.
- Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

7.NS.3 -

- Understand place value of whole numbers and decimals.
- Compare rational numbers.
- Understand and apply order of Operations.
- Fluently add, subtract, multiply, and divide rational numbers.

7.EE.2 -



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- Write, read, and evaluate numerical and algebraic expressions.
- Identify parts of an algebraic or numerical expression using mathematical terms.
- Identify equivalent expressions using properties of operations.

7.EE.4a -

- Identify parts of an algebraic or numerical expression using mathematical terms.
- Solve one-step equations and inequalities.
- Identify equivalent expressions.
- Analyze the relationship between dependent and independent variables.

| Lesson 1 | Lesson 2 | Lesson 3 | Lesson 4 | Lesson 5 |
|---|--|--|--|---|
| <p>Lesson Topic Additive Inverse</p> <ul style="list-style-type: none"> • Opposites Combine to Make Zero with Rational Numbers <p>Standard Ref 7.NS.1</p> <p>Resource/Strategy engageNY/Module 2 Mathshell.org Grade 7 CCSS PrBL Curriculum Map https://docs.google.com/document/d/1KYgtd2q5x2clpDTwtJwpDeAoZw_M_OOR9Au5bkKXHsE/edit</p> | <p>Lesson Topic Model Integers</p> <ul style="list-style-type: none"> • Horizontal/Vertical Number Line • Adding Opposites (Integers – Combining Terms Addition/Subtraction) <p>Standard Ref 7.NS.1</p> <p>Resource/Strategy engageNY/Module 2 Mathshell.org Grade 7 CCSS PrBL Curriculum Map https://docs.google.com/document/d/1KYgtd2q5x2clpDTwtJwpDeAoZw_M_OOR9Au5bkKXHsE/edit</p> | <p>Lesson Topic Modeling Integers & Other Rational Numbers (Subtraction)</p> <p>Standard Ref 7.NS.1</p> <p>Resource/Strategy engageNY/Module 2 Mathshell.org Grade 7 CCSS PrBL Curriculum Map https://docs.google.com/document/d/1KYgtd2q5x2clpDTwtJwpDeAoZw_M_OOR9Au5bkKXHsE/edit</p> | <p>Lesson Topic Distance Between Two Rational Numbers (Absolute Value)</p> <p>Standard Ref 7.NS.1</p> <p>Resource/Strategy engageNY/Module 2 Mathshell.org Grade 7 CCSS PrBL Curriculum Map https://docs.google.com/document/d/1KYgtd2q5x2clpDTwtJwpDeAoZw_M_OOR9Au5bkKXHsE/edit</p> | <p>Lesson Topic Applying Properties to Add/Subtract Rational Numbers (Rules & Real Life Situations)</p> <p>Standard Ref 7.NS.1</p> <p>Resource/Strategy engageNY/Module 2 Mathshell.org Grade 7 CCSS PrBL Curriculum Map https://docs.google.com/document/d/1KYgtd2q5x2clpDTwtJwpDeAoZw_M_OOR9Au5bkKXHsE/edit</p> |



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| Lesson 6 | Lesson 7 | Lesson 8 | FAL | Lesson 9 |
|---|---|--|--|--|
| <p>Lesson Topic Multiplication of Integers/Signed Numbers</p> <p>Standard Ref 7.NS.1c; 7.NS.2a-d</p> <p>Resource/Strategy engageNY/Module 2 Mathshell.org Grade 7 CCSS PrBL Curriculum Map https://docs.google.com/document/d/1KYgt2q5x2clpDTwtJwpDeAoZw_M_00R9Au5bkKXHsE/edit</p> | <p>Lesson Topic Dividing Integers</p> <p>Standard Ref 7.NS.3; 7.EE.2; 7.EE.4a</p> <p>Resource/Strategy engageNY/Module 2 Mathshell.org Grade 7 CCSS PrBL Curriculum Map https://docs.google.com/document/d/1KYgt2q5x2clpDTwtJwpDeAoZw_M_00R9Au5bkKXHsE/edit</p> | <p>Lesson Topic Fraction/Decimal Conversions</p> <p>Standard Ref 7.NS.3; 7.EE.2; 7.EE.4a</p> <p>Resource/Strategy engageNY/Module 2 Mathshell.org Grade 7 CCSS PrBL Curriculum Map https://docs.google.com/document/d/1KYgt2q5x2clpDTwtJwpDeAoZw_M_00R9Au5bkKXHsE/edit</p> | <p>Lesson Topic Translating Between Fractions, Decimals and Percents</p> <p>Standard Ref 6.NS; 7.NS.3; 7.EE.2; 7.EE.4a</p> <p>Resource/Strategy Mathshell.org</p> | <p>Lesson Topic Properties to Multiply/Divide Rational Numbers (Rules)</p> <p>Standard Ref 7.NS.3; 7.EE.2; 7.EE.4a</p> <p>Resource/Strategy engageNY/Module 2 Mathshell.org Grade 7 CCSS PrBL Curriculum Map https://docs.google.com/document/d/1KYgt2q5x2clpDTwtJwpDeAoZw_M_00R9Au5bkKXHsE/edit</p> |
| Lesson 10 | Lesson 11 | | | |
| <p>Lesson Topic Applying Operations with Rational Numbers to Expressions/Equations</p> <ul style="list-style-type: none"> • Numerical Solutions Using Tape Diagram • Write/Evaluate Equivalent Expressions & Equations with | <p>Performance Tasks Investments—Performing Operations with Rational Numbers</p> <p>Standard Ref 7.NS.1c; 7.NS.2a-d</p> <p>Resource/Strategy engageNY/Module 2</p> <ul style="list-style-type: none"> • Lesson 20 | | | |



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Rational Numbers

Standard Ref

7.NS.1c; 7.NS.2a-d

Resource/Strategy

[engageNY/Module 2](#)

[Mathshell.org](#)

Grade 7 CCSS PrBL

Curriculum Map

https://docs.google.com/document/d/1KYgt2q5x2clpDTwtJwpDeAoZw_M_OOR9Au5bkKXHsE/edit