

MATHEMATICS COMMON CORE CURRICULUM UNIT 4

North Smithfield Public Schools

TITLE OF UNIT: Equations **COURSE OR GRADE :** 8

DATE PRESENTED: _____ **DATE DUE:** _____ **LENGTH OF TIME:** 45 Days

OVERVIEW OF UNIT:

Students will understand connections between proportional relationships, lines, and linear equations.
Students will analyze and solve linear equations and pairs of simultaneous linear equations.
Students will use functions to model relationships between quantities.

**ESSENTIAL QUESTION, PROMPT,
PROBLEM/UNIT**

Equations

STANDARDS: Common Core Math Standards – Grade level domains 6-8

Ratios and Proportional Relationships RP	The Number System NS	Expressions and Equations EE	Functions (grade 8) F	Geometry G	Statistics and Probability SP
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: Mathematical Practices grades K-12

- | | | | | |
|---|--|--|---------------------------------------|--|
| 1. Make sense of problems and persevere in solving them | 3. Construct viable arguments and critique the reasoning of others | 5. Use appropriate tools strategically | 7. Look for and make use of structure | 8. Look for and express regularity in repeated reasoning |
| 2. Reason abstractly and quantitatively | 4. Model with mathematics ★ | 6. Attend to precision | | |

FOCUS MATHEMATICS STANDARDS: see curriculum _____ for specific standards, e.g. **(CUT AND PASTE FROM MAP)**

- Understand the connections between proportional relationships, lines, and linear equations. **8.EE.5, 8**
- Analyze and solve linear equations and pairs of simultaneous linear equations. **8.EE.7, 8**
- Use functions to model relationships between quantities. **8.F.4, 5**

Applied Learning Standards:

problem solving communication critical thinking research reflection/ evaluation

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ENDURING UNDERSTANDING: (CUT AND PASTE FROM CURRICULUM – ESSENTIAL KNOWLEDGE)

PRIOR KNOWLEDGE:

□

□

STUDENT OBJECTIVES, SKILLS and/or NEW KNOWLEDGE: (CUT AND PASTE FROM CURRICULUM – ESSENTIAL KNOWLEDGE)

8.EE.5

- A proportional relationship has a constant rate of change (or unit rate), known as the slope.
- Equations for proportional relationships are linear equations of the form $y=mx$, where m is the unit rate or slope.
- Linear equations when graphed are straight lines.
- Proportional relationships can be compared using graphs, tables, and equations by analyzing the slopes (unit rates).

8.EE.6

- Proportional relationship when graphed, are straight lines that goes through the origin.
- Equations for linear relationship are of the form $y=mx$, where m is the unit rate or slope and goes through the origin or $y=mx+b$ for a line intercepting the vertical axis at b .
- Proportional relationships are a special form of a linear relationship.
- The slope m is the same between any two distinct points on a non-vertical line in the coordinate plane. (This is shown using similar triangles.)

8.EE.7

- Linear equations in one variable have one solution, infinitely many solutions or no solutions.
- Linear equations can be expanded and simplified using the distributive property and combining like terms.

8.EE.8

- The solution to a system of linear equations in two variables is the point/ ordered pair on a graph where the two lines will intersect.
- The solution to a system of linear equations in two variables is the point/ ordered pair that satisfies both equations.
- System of linear questions can be solved algebraically to find the point of intersection and then checked graphically.

8.F.4

- Linear functions are functions that have a constant rate of change (slope) and an initial value.
- The initial value of a linear function is the place where the line will intersect the vertical axis or the y-intercept.
- Linear functions are represented as verbal descriptions, tables, graphs and equations that are all related by the same rate of change (slope) and initial value.

8.F.5

- Real world functional relationships between two quantities can be represented using verbal descriptions and graphs

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ACTIVITIES, PRODUCTS, PERFORMANCE, and ASSESSMENTS: see curriculum introduction

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|---|--|--|---|
| 1. Application to real world problems
2. Creating charts/collecting data
3. Collaboration - interpersonal
4. Conferencing
5. Exhibits | 6. Graphic organizers
7. Graphing
8. Interviews
9. Journals
10. KWL charts
11. Mathematical Practices
12. Modeling ★
13. Oral presentations | 14. Problem/Performance based/common tasks
15. Real-life applications involving graphing
16. Represent numbers
17. Rubrics/checklists (mathematical practice, modeling) | 18. Technology
19. Summarizing and note-taking
20. Tests and quizzes
21. Writing genres Arguments/ opinion Informative |
|---|--|--|---|

Lesson	Sections	Resources	Timeframe
Multiplying Rational Numbers	1.2	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	1
Dividing Rational Numbers	1.3	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	1
Adding and Subtracting with unlike Denominators	1.4	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	1
Quiz			1
Solving Equations with Rational Numbers	1.5	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	2
Solving 2-Step Equations	1.6	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	2
Quiz			1
Application- Pg 35-38 Complete with a partner over 2 class periods and 2 nights HW.	Ch 1	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	2
Interpreting Graphs	2.3	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	1
Functions	2.4	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	2
Equations, Tables , and Graphs (verbal notes)	2.5	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	1
Quiz			1
Graphing Linear Equations	8.1	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	2
Slope of a Line	8.2	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	2
Using Slopes and Intercepts	8.3	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	2
Quiz			1
Point Slope Form	8.4	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	2
Direct Variation	8.5	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	1
Solving Systems of Linear Equations by Graphing	8.6	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	2
Quiz			1
Application- Performance Task Pg 331 with a partner. 1 class + 1HW	Ch 8	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	1
Simplifying Algebraic Expressions	7.1	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	1
Solving Multi-Step Equations	7.2	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	2-3
Solving Equations with Variables on Both Sides	7.3	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	2-3
Systems of Equations	7.4	HMH Mathematics <i>Explorations in Core Math Grade 8</i>	2
Quiz			1
Review/ Practice			3
Unit Assessment			2

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HIGHER ORDER THINKING SKILLS: Web's Depth of Knowledge 2 – 4 or Bloom's Taxonomy

Web's Depth of Knowledge

- skill/conceptual understanding
- strategic reasoning
- extended reasoning

Bloom's Taxonomy

- apply
- analyze
- synthesize/create
- evaluate

ADDITIONAL RESOURCES: see curriculum for specifics

- HMH Mathematics *Explorations in Core Math Grade 8*
- Kuta Software Website

VOCABULARY (CUT AND PASTE FROM CURRICULUM)

- HMH Mathematics *Explorations in Core Math Grade 8*
 - Chapter 1 Pg 4
 - Chapter 2 Pg 46
 - Chapter 7 Pg 258
 - Chapter 8 Pg 294

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OBJECTIVES:

Lessons	Sections	Objective
Multiplying Rational Numbers	1.2	Students will multiply rational numbers.
Dividing Rational Numbers	1.3	Students will divide rational numbers.
Adding and Subtracting with unlike Denominators	1.4	Students will add and subtract fractions with unlike denominators.
Quiz		
Solving Equations with Rational Numbers	1.5	Students will solve equations that contain rational numbers.
Solving 2-Step Equations	1.6	Students will solve equations that contain multiple operations.
Quiz		Students will
Application- Pg 35-38 Complete with a partner over 2 class periods and 2 nights HW.	Ch 1	Students will apply operations on rational numbers and write equations to represent real life problems.
Interpreting Graphs	2.3	Students will describe the relationships between a graph and a given situation.
Functions	2.4	Students will represent a function with a table or a graph.
Equations, Tables , and Graphs	2.5	Students will use equations, tables, and graphs to represent relationships between 2 variables.
Quiz		
Graphing Linear Equations	8.1	Students will identify the rate of change from a table or a graph.
Slope of a Line	8.2	Students will calculate the slope using 2 points on a line.
Using Slopes and Intercepts	8.3	Students will use slopes and intercepts to write and graph linear equations.
Quiz		
Point Slope Form	8.4	Students will write and identify parts of equations written in point slope form.
Direct Variation	8.5	Students will identify if a function varies directly.
Solving Systems of Linear Equations by Graphing	8.6	Students will solve a system of linear equations by graphing.
Quiz		
Application- Performance Task Pg 331 with a partner. 1 class + 1HW	Ch 8	Students will write and graph equations to represent real life situations.
Simplifying Algebraic Expressions	7.1	Students will simplify algebraic expressions.
Solving Multi-Step Equations	7.2	Students will solve equations by collecting like terms and multiplying expressions.
Solving Equations with Variables on Both Sides	7.3	Students will solve equations with variable on both sides. The students will determine the number of solutions of an equation.
Systems of Equations	7.4	Students will solve a system of equations by substitution and graphing.
Quiz		
Review/ Practice		
Unit Assessment		

- **Assessments:** see curriculum introduction
 - **Formative**
 - **Summative**

SUGGESTED PROBLEMS: (CUT AND PASTE FROM CURRICULUM TEACHING PROBLEMS OR ASSESSMENTS)