

## **Unit IV: Solving Inequalities** **Algebra 1**

8 Class Meetings – Revised July 2016

### **Essential Questions**

- How can inequalities be used to represent relationships and solve problems?

### **Enduring Understandings and Unit Goals**

**EU #1:** Inequalities have an infinite number of solutions and can be represented on a number line.

- Identify the meanings of each inequality symbol.
- Represent the solutions to an inequality on a number line.

**EU #2:** Properties of real numbers, properties of equality, and inverse operations can be used to isolate a variable in order to obtain a solution to a linear inequality and model real-world situations.

- Utilize inverse operations to solve and graph one- and two-step linear inequalities.
- Understand that multiplying or dividing by a negative number changes the symbol of an inequality.

**EU #3:** There is a precise order to solving multi-step linear inequalities.

- Apply the five steps to solve and graph a multi-step linear inequality.

**EU #4:** A compound inequality uses the words “and” and “or” to consider two inequalities simultaneously.

- Differentiate the meanings of compound inequalities using “and” and compound inequalities using “or” and use this to graph the solution.

### **Standards**

#### **Common Core State Standards:**

- CCSS.MATH.CONTENT.HSN.Q.A.2: Define appropriate quantities for the purpose of descriptive modeling.
- CCSS.MATH.CONTENT.HSA.CED.A.1: Create equations and inequalities in one variable and use them to solve problems.
- CCSS.MATH.CONTENT .HSA.CED.A.4: Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.
- CCSS.MATH.CONTENT.HSA.REI.A.3: Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
- ELA-LITERACY.RST.9-10.7  
Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table, chart or equation) and translate information expressed visually or mathematically (e.g., in an equation) into words.

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### **MSMHS 21<sup>st</sup> Century Learning Expectations**

**Competency 1:** Read and write effectively for a variety of purposes.

**Competency 3:** Make decisions and solve problems independently and collaboratively.

**Competency 5:** Contribute to a positive learning environment with respect and responsibility.

### **Unit Content Overview**

#### **1. Inequalities and Their Graphs (3-1)**

- Writing Inequalities
- Identifying Solutions by Evaluating
- Graphing an Inequality
- Writing an Inequality From a Graph

#### **2. Solving Inequalities Using Addition and Subtraction (3-2)**

- Using Addition and Subtraction to Solve Inequalities
- Writing and Solving an Inequality

#### **3. Solving Inequalities Using Multiplication or Division (3 -3)**

- Multiplying or Dividing by a Positive Number
- Multiplying or Dividing by a Negative Number

#### **4. Solving Multi-Step Inequalities (3-4)**

- Using More than One Step
- Writing and Solving a Multi-Step Inequality
- Using the Distributive Property
- Solving an Inequality With Variables on Both Sides

#### **5. Compound Inequalities (3-6)**

- Writing a Compound Inequality
- Solving a Compound Inequality Involving “And”
- Solving a Compound Inequality Involving “Or”
- Using Interval Notation

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#### **Learning Objectives**

**Students will be able to...**

- Write, graph, and identify solutions of inequalities (3-1)
- Use addition or subtraction to solve inequalities (3-2)
- Use multiplication or division to solve inequalities (3-3)
- Solve multi-step inequalities (3-4)
- Solve and graph compound inequalities containing “and” (3-6)
- Solve and graph compound inequalities containing “or” (3-6)
- Identify the occasions when a compound inequality has no solution or infinite solutions (3-6)

#### **Assured Learning Experiences**

##### **Instructional Strategies/Differentiation**

- Daily Warm Up Activities
- Power Point Lecture with note-taking
- Guided Notes
- Flexible grouping
- Exit slips
- Graphic Organizers
- Creating authentic connections for students
- Rephrasing and restatement of information and concepts
- Accountable Talk Discussion
- Independent Problem Solving
- Collaborative Problem Solving
- Inequality Station Performance Task (practical application)
  - Rubric 3: Problem Solving
- Homework

##### **Interdisciplinary Connections**

- Language Arts- Accountable Talk, Word Problems

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## **Assessments**

### **FORMATIVE ASSESSMENTS:**

- Warm ups (SAT prep)
- ABCD Cards
- Whiteboards
- Mid-class check-ins
- Exit Slips
- Student-led instruction
- Homework
- Inequality Station Performance Task
  - Rubric 3: Problem Solving

### **SUMMATIVE ASSESSMENTS:**

- Quiz on EU #1 and EU #2
- Quiz on EU #3 and EU #4
- Unit Test
- Inequality Station Performance Task

## **Unit Task**

### **Unit Task Name: Inequality Stations**

**Description:** Students will use information learned in this unit about how to represent an inequality on a number line (EU #1), how inverse operations can be used to solve a linear inequality (EU #2) and how the steps to solving a multistep inequality are the same as solving a multistep equation (EU #3) and how to solve and graph compound inequalities (EU #4) in order to solve numeric and word inequality problems. Stations will be posted around the room displaying various numeric or word inequality problems. Students will work in small groups and will begin by choosing a station to start with and solving the problem on their answer sheet. They will then search for their answer at the bottom of another station and solve the problem at that station. This will provide them the opportunity to check their answer and they will not be able to move on if they have it incorrect. They will continue this process until their answer brings them back to their first station. Throughout this process students will be required to show their step by step calculations on a provided answer sheet.

**Evaluation:** Rubric 3: Problem Solving

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#### **Unit Resources**

- Textbook (Charles, Randall I., Dan Kennedy, and Basia Hall. *Algebra 1: Common Core*. Boston, MA: Pearson, 2012)
- MSMHS School-wide Rubrics
- Internet databases
- Laptops