

Unit 4: Inequalities

Algebra Prep

11 Class Meetings

Created July 2020

Essential Questions

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

Enduring Understandings with 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:

- **HS.A.REI.B.3:** Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
- **HS.A.CED.A.1:** Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- **HS.A.CED.A.3:** Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.
- **7.EE.B.4.B:** Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p , q , and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.
- **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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ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.

Competency 2: Speak to diverse audiences in an accountable manner.

Competency 3: Develop the behaviors needed to interact and contribute with others on a team.

Competency 4: Analyze and solve problems independently and collaboratively.

Competency 5: Be responsible, creative, and empathetic members of the community.

Unit Content Overview

1. Inequalities and Their Graphs

- Differentiate inequality symbols
- Write inequalities
- Identify solutions by evaluating
- Graph an inequality on a number line
- Write an inequality from a graph

2. Solving Inequalities Using Addition and Subtraction

- Use addition and subtraction to solve inequalities
- Write and solving an inequality

3. Solving Inequalities Using Multiplication or Division

- Multiply or divide by a positive number
- Multiply or divide by a negative number

4. Solving Multi-Step Inequalities

- Write and solve multi-step inequalities
- Apply the distributive property to inequalities
- Solve an inequality with fractions and decimals
- Solve an inequality with variables on both sides

5. Compound Inequalities

- Write a compound inequality
- Solve a compound inequality involving “and/or”

Interdisciplinary Connection:

- Language Arts - Word Problems
- Marine Science – Word Problems

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Daily Learning Objectives with *Do Now Activities*

Students will be able to...

- Write, graph, and identify solutions of inequalities
 - *What are the different inequality symbols and what does each mean?*
- Apply inverse operations to solve one and two step inequalities and graph their solutions
 - *When you solve an equation, what steps do you follow?*
- Solve and explain multi-step inequalities and graph their solutions
 - *How do you decide which direction to point your graph when you solve an inequality?*
- Solve and graph compound inequalities containing “and/or” with special cases
 - *What is the difference between AND and OR? (Picture Activity)*
- Write and solve inequalities to describe real world situations

Instructional Strategies/Differentiated Instruction

- Whole-group instruction
- Graphic organizers
- Creating authentic connections for students
- Rephrasing and restatement of information and concepts
- Guided notes
- Student-led instruction
- Small group instruction
- Independent problem-solving
- Collaborative problem-solving
- Cross-curricular problem solving (independent and collaborative)
- Accountable Talk
- Manipulatives
- Word walls with visuals
- Homework

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Assessments

FORMATIVE ASSESSMENTS:

- Warm ups (SBAC)
- ABCD Cards
- Whiteboards
- Mid-class check-ins
- Exit Slips
- Student-led instruction
- Homework
- Accountable Talk Discussions
- Daily Do Now
- Performance Task - Inequality Stations
- Future Rubric Assessment in 2021-2022

SUMMATIVE ASSESSMENTS:

- Quiz 1 – EU 1, 2, 3
- Quiz 2 – EU 4
- Unit 4 Test
- Performance Task - Inequality Stations

Unit Task

Unit Task Name: Inequality Stations

Description: Students will use information learned in this unit about how inequalities have an infinite number of solutions and can be represented on a number line (EU 1), how inverse operations can be used to solve linear inequalities (EU 2), how there is a precise order to solving multi-step linear inequalities (EU 3), and how compound inequalities use the words “and” and “or” to consider two inequalities simultaneously (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: Summative Assessment and Future Rubric in 2021-2022 school year

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Unit Resources

- Flipped Google Classroom Videos
- Worksheets
- Calculator
- Laptops
- SBAC Prep Online
- Kahn Academy
- Match Fishtank
- Map.Mathshell.org
- Online resources