Inequalities

Reporting Category	Patterns, Functions, and Algebra
Topic	Solving one and two step linear equations
Primary SOL	7.15 The student will a) solve one-step inequalities in one variable; and b) graph solutions to inequalities on the number line
Related SOL	7.13, 7.14, 7.16

Materials

- Inequalities Practice (attached)
- Solving Inequalities Matching Activity (attached)
- Calculators

Vocabulary

expression, variable, equation, order of operations, properties (earlier grades)

inequality (7.15)

one-step equation, inverse operations, two-step equation (7.14)

variable expression, numerical expression, verbal expression, verbal sentence, algebraic expression, algebraic equation (7.13)

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Present the inequality $x < 5$, and have students write what they think it means. Discuss as a class, and be sure to include important vocabulary like variable and inequality along with inequality symbols. Present more inequality examples to expose students to all inequality symbols. Be sure to discuss the differences between expressions, equations, and inequalities.
2. Present the inequality $x + 5 > 8$, and ask students to work with a partner to solve it. Ask students to describe how they solved for the variable and to compare the process to solving equations. During this discussion, also be sure to compare the solutions to equations versus the solutions for inequalities. Show how to check the solution for an inequality.
3. Ask students to use the Think-Pair-Share strategy to investigate how they might go about graphing this inequality on a number line. Demonstrate how this is done. Discuss how the inequality symbol determines whether the circle is closed or open and which direction it is colored.
4. Do more examples with students that include all operations. Be sure to include examples so you can discuss what happens when you multiply or divide by a negative. Distribute the Inequalities Practice, and have students solve the inequalities and graph the solutions.
5. Have students do the Solving Inequalities Matching Activity.

Assessment

- **Questions**
  - How are the procedures for solving equations and inequalities similar?
  - How is the solution to an inequality different from that of an equation?
- **Journal/Writing Prompts**
  - Create your own one-step inequality, and explain how to solve it.
  - Explain how graphing a linear inequality helps us understand the inequality. Use an example in your explanation.
- **Other**
  - Have students create their own set of matching cards. (The first would show an inequality; the second would have a solution; and the third would have a graph.)
  - Have students "proofread" inequalities for mistakes and make any necessary corrections.

Extensions and Connections (for all students)

- Have students create word problems that represent inequalities.
- Have students solve two-step inequalities.

Strategies for Differentiation

- Use different types of manipulatives and online resources to assist students with solving inequalities.

Inequalities Practice

Name _____ **Date** _____

Solve each inequality, and graph its solution.

$x + 8 \geq 18$

$x - 7 > 6$

$-4 + x \geq -8$

$n - 2 \leq 4$

$-2 + x < -14$

$2n > 2$

$-5x \geq 25$

$\frac{n}{4} < -3$

$\frac{m}{-5} > 2$

$-6 \geq \frac{k}{2}$

Solving Inequalities Matching Activity

Name _____ **Date** _____

Solve each inequality. Show your work in the space provided. Match your answers to one of the choices on the next page. Be careful with signs! Graph each inequality when you are finished.

$n - 5 < 4$	$n + 7 \geq 10$	$8n > 32$	$4n \leq -12$
$n + 4 > 13$	$n - 13 < -3$	$-3n > -6$	$n - 4 \leq 7$
$n - 5 < -13$	$\frac{n}{-5} < 6$	$\frac{n}{3} \geq -7$	$\frac{n}{6} > -4$

$n > 4$ **A**	$n \leq 11$ **B**	$n < 10$ **C**	$n \leq -3$ **D**
$n < -8$ **E**	$n \geq -21$ **F**	$n < 9$ **G**	$n > 9$ **H**
$n > -30$ **I**	$n > -24$ **J**	$n < 2$ **K**	$n \geq 3$ **L**