Student Teacher's Name: Douglas Erickson, Kyle Ivanoff, Jordan Stirtz **Grade Level:** 9th

Subject: Algebra 1 **Name of Lesson:** Solving Inequalities

I. **Goal:** Students will be able to use their knowledge to solve multistep inequalities in Algebra 1 class with 80% accuracy

The student who has mild mental retardation will be able to solve simple addition and subtraction problems.

The students who are gifted will be able too more difficult solve multistep inequalities with 85% accuracy.

II. **Objectives:**

1.) Students will be able to solve for independent variables in inequalities.

2.) Students will be able to graph the solutions on a number line.

3.) Students will be able to solve word problems.

III. **Adaptations for Diverse Learners**

- Student who has mild MR will be going to each station but will be working on addition and subtraction problems, either with flash cards or with money.
- Instructions written in Spanish will be provided for the students who have difficulty speaking English.
- The gifted students will be assigned to solve the problems that are more difficult at each station.
- The student with a learning disability will have instructions read aloud by a classmate at each station.

IV. **Materials:** White board, 4 stations, pencil, paper, station worksheets

V. **Procedure:**

A. Set / Hook (Planning): "Find your name on the board and get together with your group." Each station will have different problems with different difficulties and the students will have one assigned problem and then one problem that they can choose.

B. Transition: Explain the process: "You will work individually on the problem you are assigned and the problem you choose. If you have questions you can ask those in your group for help. You will have 8 minutes at each station to complete the two problems. Once the 8 minutes are complete, I will tell you to move to the next station. It is important for you to stay on task so you can finish the problems. Now you may now begin."

C. Main lesson: Students will complete 2 of the 5 problems at each station.

D. Transition: When finished, start on another problem at that station, not necessarily working for completion.

E. Conclusion: Bring class back to one group. Ask what problem did not make sense from each station and work through on the board. Tell the students there will be a quiz tomorrow over the material covered in each stations so review notes, practice problems, and the problems from the stations.

VI. **Assessment:** Students will be assessed through the individual work at each station, participation in the activity, and the quiz the next day.

VII. **Assignment:** Students will turn in their individual copy from the problems at each station.

Station 1
In this station you will solve each inequality and check solution.

1. $11y + 13 \leq -1$

   $8n - 10 < 6 - 2n$

   $\frac{q}{7} + 1 > -5$

2. $-8m - 3 < 18 - m$

   $-4y - 10 > 19 - 2y$

   $9n - 24n + 45 > 0$

3. $\frac{-3x + 6}{2} \leq 12$

   $\frac{4x - 2}{5} \geq -4$

   $7.3y - 14.4 > 4.9$

4. $6y + 10 > 8 - (y + 14)$

   $4.6(x - 3.4) > 5.1x$

   $-5x - (2x + 3) \geq 1$

5. $3(2y - 4) - 2(y + 1) > 10$

   $8 - 2(b + 1) < 12 - 3b$

   $-2(k - 1) > 8(1 + k)$

Station 2
In this station you will define a variable, write an inequality, and solve each problem.

1. Negative one times a number is greater than -7.

2. Two thirds of a number plus eight is greater than twelve.

3. The sum of twelve and a number is no greater than the sum of twice the number and -8.

4. Three times the sum of a number and six is greater than four times the number decreased by two.

5. Four more than the quotient of a number and three is at least nine.

Station 3
In this station you will solve the inequality and graph the solution on a number line.

1. $3 \leq 2x < 7$

2. $-25 < 5x < -20$

3. $-4 \leq 9x - 1 < 5$

4. $2x + 7 < 3$ or $5x + 5 \geq 10$

5. $3x + 8 > 17$ or $2x + 5 \leq 7$

Station 4
In this station you will solve the word problems using multistep inequalities.

1. A person must be at least 52 inches tall to ride the Power Tower ride at Cedar Point in Ohio. Write an inequality that describes the required heights.

2. The lowest temperature ever recorded was $-128.6°$F at the Soviet station Vostok in Antarctica. The highest temperature ever recorded was 136°F at Azizia, Libya. Write a compound inequality whose solution includes all the other temperatures T ever recorded.

3. Keith's dog weighs 90 pounds. The veterinarian told him that a healthy weight for his dog would be less than 75 pounds. If Keith's dog can lose an average of 1.25 pounds per week on a certain diet, how long will it take the dog to reach a healthy weight?

4. The perimeter of a rectangular playground must be no greater than 120 meters, because that is the total length of the materials available for the border. The width of the playground cannot exceed 22 meters. What are the possible lengths of the playground.

5. Nicholas has 13 dollars to order a pizza. The pizza costs 7.50 dollars plus 1.25 dollars per topping. He plans to tip 15 percent of the total cost of the pizza. Write and solve an inequality to find how many toppings he can order.

Station 1
In this station you will solve each inequality and check solution.

1. $11y + 13 \leq -1$ $y \leq -\frac{14}{11}$

   $8n - 10 < 6 - 2n$ $n < \frac{8}{5}$

   $\frac{q}{7} + 1 > -5$ $q > -42$

2. $-8m - 3 < 18 - m$ $m > -3$

   $-4y - 10 > 19 - 2y$ $y < -14\frac{1}{2}$

   $9n - 24n + 45 > 0$ $n < 3$

3. $\frac{-3x + 6}{2} \leq 12$ $x \geq -6$

   $\frac{4x - 2}{5} \geq -4$ $x \geq -4\frac{1}{2}$

   $7.3y - 14.4 > 4.9$ $y > 6$

4. $6y + 10 > 8 - (y + 14)$ $y > -2\frac{2}{7}$

   $4.6(x - 3.4) > 5.1x$ $x < -31.28$

   $-5x - (2x + 3) \geq 1$ $x \leq -\frac{4}{7}$

5. $3(2y - 4) - 2(y + 1) > 10$ $y > 6$

   $8 - 2(b + 1) < 12 - 3b$ $b < 6$

   $-2(k - 1) > 8(1 + k)$ $k < -\frac{3}{5}$

Station 2
In this station you will define a variable, write an inequality, and solve each problem.

1. Negative one times a number is greater than -7.

$-n > -7$, $n < 7$

2. Two thirds of a number plus eight is greater than twelve.

$\frac{2}{3}n + 8 > 12$, $\frac{2}{3}n > 4$ $\boxed{n > 6}$

3. The sum of twelve and a number is no greater than the sum of twice the number and -8.

$12 + n \leq 2n + -8$, $n \geq 20$

4. Three times the sum of a number and six is greater than four times the number decreased by two.

$3(n+6) > 4n - 2$, $n < 20$

5. Four more than the quotient of a number and three is at least nine.

$\frac{n}{3} + 4 \geq 9$, $n \geq 15$

Station 3
In this station you will solve the inequality and graph the solution on a number line.

1. $3 \leq 2x < 7$

$\frac{3}{2} \leq x < \frac{7}{2}$

2. $-25 < 5x < -20$

$-5 < x < -4$

3. $-4 \leq 9x - 1 < 5$

$-\frac{1}{3} \leq x < \frac{2}{3}$

4. $2x + 7 < 3$ or $5x + 5 \geq 10$

$x < -2$ or $x \geq 1$

5. $3x + 8 > 17$ or $2x + 5 \leq 7$

$x > \frac{11}{3}$ or $x \leq 1$

Station 4
In this station you will solve the word problems using multistep inequalities.

1. A person must be at least 52 inches tall to ride the Power Tower ride at Cedar Point in Ohio. Write an inequality that describes the required heights.

$h \geq 52$

2. The lowest temperature ever recorded was $-128.6°F$ at the Soviet station Vostok in Antarctica. The highest temperature ever recorded was $136°F$ at Azizia, Libya. Write a compound inequality whose solution includes all the other temperatures T ever recorded.

$-128.6 \leq T \leq 136$

3. Keith's dog weighs 90 pounds. The veterinarian told him that a healthy weight for his dog would be less than 75 pounds. If Keith's dog can lose an average of 1.25 pounds per week on a certain diet, how long will it take the dog to reach a healthy weight?

Let w = the number of weeks, $1.25w > 90 - 75$, it will take more than 12 weeks for the dog to reach a healthy weight.

4. The perimeter of a rectangular playground must be no greater than 120 meters, because that is the total length of the materials available for the border. The width of the playground cannot exceed 22 meters. What are the possible lengths of the playground.

Less than or equal to 38 meters

5. Nicholas has 13 dollars to order a pizza. The pizza costs 7.50 dollars plus 1.25 dollars per topping. He plans to tip 15 percent of the total cost of the pizza. Write and solve an inequality to find how many toppings he can order.

$7.5 + 1.25x + 0.15(7.5 + 1.25x) < 13$; 3 or fewer toppings

Quiz

Solve the multistep inequalities.

1. $-8m - 3 < 18 - m$

$-4y - 10 > 19 - 2y$

$9n - 24n + 45 > 0$

2. $\frac{-3x + 6}{2} \leq 12$

$\frac{4x - 2}{5} \geq -4$

$7.3y - 14.4 > 4.9$

3. $6y + 10 > 8 - (y + 14)$

$4.6(x - 3.4) > 5.1x$

$-5x - (2x + 3) \geq 1$

4. Two thirds of a number plus eight is greater than twelve.

5. The sum of twelve and a number is no greater than the sum of twice the number and -8.

6. Three times the sum of a number and six is greater than four times the number decreased by two.

7. $-25 < 5x < -20$

8. $-4 \leq 9x - 1 < 5$

9. $2x + 7 < 3$ or $5x + 5 \geq 10$

10. The lowest temperature ever recorded was $-128.6°$F at the Soviet station Vostok in Antarctica. The highest temperature ever recorded was $136°$F at Azizia, Libya. Write a compound inequality whose solution includes all the other temperatures T ever recorded.

11. Keith's dog weighs 90 pounds. The veterinarian told him that a healthy weight for his dog would be less than 75 pounds. If Keith's dog can lose an average of 1.25 pounds per week on a certain diet, how long will it take the dog to reach a healthy weight?

12. The perimeter of a rectangular playground must be no greater than 120 meters, because that is the total length of the materials available for the border. The width of the playground cannot exceed 22 meters. What are the possible lengths of the playground.

Activity:
Date:

Activity Evaluation

Name	Contributed to Group	Stayed on Task	Appropriate Group-Work	Completed Work in Alloted Time

+ - excellent
√ - meets expectations
¬ - needs work