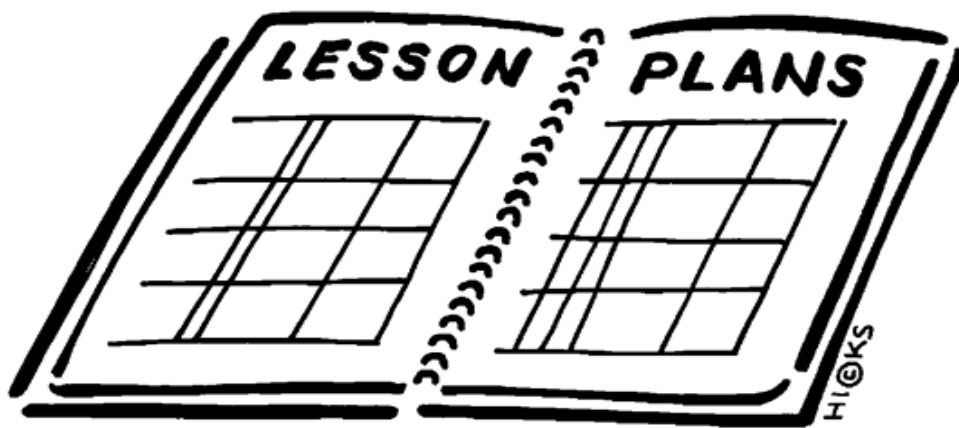




كليات التقنية العليا
HIGHER COLLEGES OF TECHNOLOGY

Solve inequalities by Multiplication or Division (Lesson plan)



Student Information:

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Class: AE5

Grade Level: Grade 7 section 1

Submission Date: 25th of April 2014

Teacher Name:

Miss Kate Quinlan

Name: Aaasha Bani Shemali H00225265	Grade Level: 2	CCSS Math Strand: <u>Expressions and Equations</u> <u>(7.EE)</u> (7.EE.4) (7.EE.4b)
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CCSS Standards:

Expressions and Equations (7.EE)

(7.EE.4) Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

(7.EE.4b) 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. For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.

Lesson 1

Main Lesson Aims and objective (Concepts, Procedures, & Processes):

Add within 20

- **By the end of the lesson, students will be able to solve inequalities by using the Multiplication or Division Properties of Inequality. Students will be able:**

- **To solve inequalities when multiplying or dividing by a positive number**
- **To solve inequalities when multiplying or dividing by a negative number**

(Glencoe Math course 2 Teacher Edition "Plan & Present" Chapter 6, Lesson 7 "What's the Math")

Materials:

teacher books	Glencoe Math course 2 (grade 7) Teacher Edition "Plan & Present" Chapter 6, Lesson 7 "Common Core State Standards" "Teach the concept"
student book(s)	Glencoe Math p 674 #a -b Glencoe Math p 675 #c Glencoe Math p 679 #1-9 Glencoe Math p 680 #20 Glencoe Math p 682 #34
worksheets/ papers	- Homework sheet
teacher materials	- White board - TV stand - Question of the day in A3
student materials/ manipulatives	- Each group of students will have flash cards - Inequality symbol in A3 for each group. - A3 papers for fun run game - Fun run game questions cards for (4 copies) - A3 blank papers for each group (3 paper for each group) - Colour pen case (one each group)
technology	- PowerPoint of chapter vocabulary - Smart board

Key vocabulary with definitions (and pictures if appropriate):

word	glossary definition	image
Inequality	inequality An open sentence that uses $<$, $>$, \neq , \leq , or \geq to compare two quantities.	$x + 1 < 1$
graph	graph The process of placing a point on a number line or on a coordinate plane at its proper location.	

Cited from: *My Math Grade 2 Students Edition (Ebook) Chapter 1, “Glossary”*

Students’ Prior Knowledge:

- Students know what inequality means
- Students know how to use number line
- Students are familiar of fun run game

Possible Problems and Misconceptions:

If students have trouble remembering when to reverse the inequality sign when solving an inequality,

Then use one of these reteach options:

1. **Quick Review Math Handbook**, p. 266
 2. **Problem-Based Learning Book 2, Unit J: Solve Equations**, Investigation 4: Solve One-Variable Inequalities
 3. Write $3 < 4$ on the board. Ask students if it is a true statement. **yes** Then ask them to multiply (or divide) each side of the inequality by 1. Write $3 \cdot 1 < 4 \cdot 1$ on the board. Is it still a true statement? **yes** Then ask students to multiply (or divide) each side of $3 < 4$ by -1 . Write $-3 < -4$ on the board. Is it still a true statement? **no** Ask students to make it a true statement without changing the numbers or the signs of the numbers. **Reverse the inequality symbol; $-3 > -4$.** Tell students they can use this same logical thinking when they forget the conditions under which the inequality sign should be reversed.
- Some students may have problem from using number line.

Graphing Inequalities Tell students that when graphing a solution on a number line, if the variable is on the left of the inequality symbol, the line of the graph will extend in the direction that the inequality symbol points. For example, for $x > 5$, the line extends to the right; for $x < 5$, the line extends to the left.

Glencoe Math course 2 Teacher Edition “Plan & Present” Chapter6, Lesson 7 “Teach the concept”

Lesson Schedule

Targeted teacher questions to promote HOTS

Student communication and use of math language

Classroom management strategy:

- T use count down from 5 to 0. This strategy help students to wrap up before submitting something or answering in their board.
- T use eyes up strategy. T will say “Eyes up” and students leave everything and look to the teacher.

Engage (warm up, review prior knowledge):

- Presenting reward of the day
- T: today reward is 200 points for a group who speak only English Miss Kate will choose

<p>the winner. (students will be excited to teach</p> <ul style="list-style-type: none"> ➤ Ss will read the definition on the board (Inequality) ➤ T will display the table of symbols and each group have a flash cards of missing words in the table. - T: in groups you have an envelope so can you open it and discuss with each other? You have one minute. - Ss will use flash cards to discuss with each other using math language. - T will ask ss “lets fill out the table and write it down on your tablets”. Students will tell me their answers <p>➤ Quiz</p> <ul style="list-style-type: none"> - T: you have 5 minute to finish your quiz. - When the time is finished T will count down from 5 to 0. 	<p>15 minutes</p>
<p>Core (introduce and practice new concepts & procedures):</p> <ul style="list-style-type: none"> ➤ Teaching the concept ✓ T will ask students questions that will help to make connection from previous lesson and this lesson: <ul style="list-style-type: none"> - T: If you were solving the equation $8x = 40$, what would be the first step to solve the equation? - Ss will raise their hand and say “Divide each side by 8” (I assume). - Based on this, what is the first step to solve the inequality? - Ss will raise their hand and say “Divide each side by 8” (I assume). ➤ Solving Inequalities for positive number. <ul style="list-style-type: none"> - T will solve inequality a on the board “Lets solve problem a together and tell me the steps” - Ss will answer with the teacher - T: solve equality by yourself? - Ss will complete the task ➤ Solving Inequalities for negative number. <ul style="list-style-type: none"> - T will solve inequality a on the board “Lets solve problem c together and tell me the steps” - Ss will answer with the teacher - T: solve equality by yourself? - Ss will complete the task ➤ Fun run game (Physical activity) <ul style="list-style-type: none"> - T will display the question card backward on the board and give students instruction of the game: <ul style="list-style-type: none"> - T: Now we will play fun run game. As you can see each group have questions on the board you need to follow these instruction: <ul style="list-style-type: none"> ○ Be faster than other groups to bring the equations. ○ You can only bring one equation at a time. ○ Solve each question as a group. ○ You will earn 200 if you answer as many question as you can. ○ You will get 100 for neatness (good handwriting) ○ Solve each inequality. ○ Good Luck 	<p>3 minutes</p> <p>5 minutes</p> <p>7 minutes</p> <p>10 – 15 minutes minutes</p>

<ul style="list-style-type: none"> - T: What will you do? (at that moment T will give each group A3 papers and colour pen case. - Ss will communicate together to tell the instruction to the T. - T: Don't forget 100 point if you speak with each other in English. - T: Question number 1, 2, 4, 5,9 you need to draw number line - T: choose one student from each group to start the game. - Ss will choose and they will go at the end of the class. - Students will start playing the game - Ss will write the answer on their tablets if they finish early answering the questions. - After students solve the question T will ask "What was the most difficult question and T will solve it on the board. 	
<p>Close (wrap up, discussion, brief review activity or assessment):</p> <ul style="list-style-type: none"> ➤ Discussion <ul style="list-style-type: none"> - After announce the winner of the run on game T will ask "What did we learn today" and students will answer the question as a whole class. ➤ Question of the day <ul style="list-style-type: none"> - T will remained students to answer the question of the day on TV at the back of the class using sticky notes. Ss will solve it during the day. - There are two question one for today and other for the next day. Note: Each lesson the we teach is for 2 period and this lesson is first period ➤ Homework <ul style="list-style-type: none"> - Teacher will give students a homework to answer it by them self to check their understanding - T: You need to solve all inequalities and - In the next day I will reteach the questions that student face difficulties to solve it. 	<p>2 minutes</p> <p>1 minute</p> <p>2 minutes</p>

Note: every question or lesson order are in the power point

A decorative border composed of various colorful paper clips (red, blue, green, purple, yellow) and small black stars, arranged in a frame around the central text. Some paper clips have small icons like hearts or stars on them.

Materials (Appendix)

Table Flash cards

Less than or Equal to

Open dot

Closed dot

Closed dot

$<$

\geq

Each group will have the flash cards on the table

Inequality Symbols

$<$

– **Less Than**

$>$

– **Greater Than**

\leq

– **Less Than or Equal to**

\geq

– **Greater Than or Equal to**

Question of the day (A3 paper)



Standardized Test Practice

20. Which inequality represents *twice a number is less than ten*?

- (A) $(5 + 2)n < 0$
- (B) $10n < -5$
- (C) $10 < 2n$
- (D) $2n < 10$

9



Standardized Test Practice

34. Which sentence represents the inequality shown below?

$$\frac{x}{5} \leq 8$$

- (A) The difference of a number and 5 is at most 8.
- (B) The quotient of a number and 5 is at most 8.
- (C) The quotient of a number and 5 is 8.
- (D) The quotient of a number and 5 is at least 8.

Homework

NAME _____ DATE _____

Lesson 7 Extra Practice

Solve Inequalities by Multiplication or Division

Solve each inequality. Graph the solution set on a number line.

1. $5p \geq 25$



2. $4x < 12$



3. $15 \leq 3m$



4. $\frac{d}{3} > 15$



5. $8 < \frac{r}{7}$



6. $9g < 27$



7. $4p \geq 24$



8. $-4 > \frac{-k}{3}$



9. $\frac{-z}{5} > 2$



10. $-3x \leq 9$



11. $-5x > -35$



12. $\frac{a}{-6} < 1$

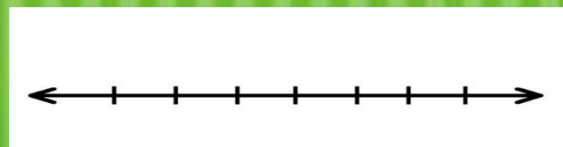


$$6y < 18$$



1

$$-3s \geq 33$$



2

$$60 = \frac{m}{3}$$



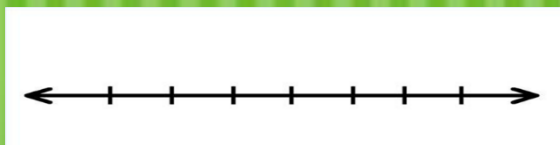
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$$\frac{t}{-2} < 6$$



4

$$\frac{m}{-14} \leq -4$$



5

$$-56 \leq -8x$$



6

$$12n \leq 54$$



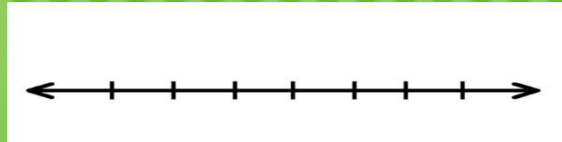
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$$\frac{h}{9} > \frac{1}{4}$$



8

$$\frac{w}{-15} \geq 9$$



9

Reference List:

Carter, J.A., Cuevas, G. J., Day, J., Malloy, C., Kersaint, G., McClain, K. Molix-Bailey, R.J., Lurchin, B. M., Price, J., Reynosa, M. E., Silbey, R., Vielhaber, K. & Willard, T. (2013). *Glencoe Math your Common Core Edition: Teacher Walkaround Edition (Course 2 – Volume 3)*. Columbus: MC Graw Hill Educion.