2.4 Creating And Solving Inequalities

Essential Question: How do you write and solve an inequality that represents a real-world situation?

CED.A.3 - Represent constraints by... inequalities... and interpret solutions as viable or nonviable options in modeling context.

Students will describe a real-world situation that can be modeled by an inequality, and write the inequality.

VOCAB

Inequality - a statement that compares two expressions that are not strictly equal by using one of the following inequality signs

Symbol	Meaning
$<$	is less than
$\leq$	is less than or equal to
$>$	is greater than
$\geq$	is greater than or equal to
$\neq$	is not equal to

Which inequality symbol would you use to represent the following words or phrases?

1). at most $\leq$ 2). farther than $>$ 3). younger than $<$ 4). up to $\leq$

At an amusement park, you may have seen a sign that said, "You must be at least 48 inches tall to ride this ride." How could you write that as an inequality?

$h \geq 48$

Nora is planning a birthday party for her little sister, Colleen. Nora's budget will allow her to spend no more than $50 for party supplies. Eight children, including Colleen, will attend the party, and Nora wants to determine how much she could spend on party favors for each child. She will also purchase a cake for $10. Write an inequality that represents the situation, and find possible solutions.

Let c represent the cost of a party favor for each child.

$10 + 8c \leq 50$
$-10 \quad -10$
$8c \leq 40$
$c \leq 5$

Suppose Nora finds party favors that cost $4 each. Use a value of 4 for c and check to see if the inequality is true.

$10 + 8(4) \leq 50$
$42 \leq 50$ yes!

Could Nora buy $6 party favors for all of her guests without going over budget?

No!

Explain 1 **Creating and Solving Inequalities Involving the Distributive Property**

You may need to use the Distributive Property before you can solve an inequality.

Distributive Property If a, b, and c are real numbers, then $a(b + c) = ab + ac$.

The inequality sign must be reversed when multiplying or dividing both sides of an inequality by a negative number.

Trina is buying 12 shirts for the drama club. She will choose a style for the blank shirts and then pay an additional charge of $2.75 for each shirt to have the club logo. If Trina cannot spend more than $99, how much can she spend on each blank shirt? Write and solve an inequality to find the possible cost of each blank shirt. Let s represent the cost of each blank shirt. **Check your answer!**

$12(s + 2.75) \leq 99$

$12s + 33 \leq 99$

$12s \leq 66$

$s \leq 5.5$

Sergio needs to buy gifts for 8 friends. He wants to give the same gift to all his friends and he plans to have the gifts wrapped for an additional charge of $1.50 each. If Sergio spends at least $70, he will receive free shipping on his order. Write and solve an inequality to determine how much Sergio needs to spend on each gift in order to receive free shipping. Let g be the cost of one gift. **Check your answer!**

$8(g + 1.50) \geq 70$

$8g + 12 \geq 70$
$-12 \quad -12$

$\frac{8g}{8} \geq \frac{58}{8}$

$g \geq 7.25$

$\frac{4}{3}(6x + 9) < 4$

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

$\frac{1}{4}x + 2 \leq -\frac{5}{2}$

$4(\frac{1}{4}x) \leq (-\frac{5}{2})4$

$x \leq -\frac{20}{2}$

$x \leq -18$

$x + 1 > -5(7-2x)$

$x + 1 > -35 + 10x$

$-x \qquad\qquad -x$

$1 > -35 + 9x$

$\frac{36}{9} > \frac{9x}{9}$

$4 > x$

When you

$\times$ or $\div$

by negative

flip sign

2.4 Homework

IXL K.8