LESSON MAKER PRO

What Fits?

Write constraints and test real options.

GRADE 7 · 7A.AF.C.20

7A.AF.C.20 "Represent constraints by equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. Limit to contexts arising from linear."

NAME _____ DATE _____

THE BIG IDEA

Let x stand for the number you can choose. Use <= for a limit and >= for a minimum. A value is viable if it fits the constraint and makes sense in the situation.

WORKED EXAMPLE

You have $23 for entry and sticker packs. Write an inequality for x packs. What is the most you can buy?

PRICES

Item	Cost
Entry	$3
Sticker pack	$4

1. Entry plus packs cannot cost more than $23: 3 + 4x <= 23.
2. Subtract 3: 4x <= 20. Divide by 4: x <= 5.
3. At x = 5, the cost is $23, so 5 packs are viable.

Answer: 3 + 4x <= 23; at most 5 packs

PRACTICE 4 problems

1 A $6 game pass plus $8 per ride must cost no more than $30. Write an inequality for x rides. Are 2 rides viable?

ANSWER _____

2 A club needs at least $42. It has $14 and earns $7 per sale. Write an inequality for x sales. Are 6 sales viable?

ANSWER _____

3 A 60-minute playlist has a 12-minute intro and songs lasting 6 minutes each. Write an equation for x songs that fill it. Find x.

ANSWER _____

4 A bag holds at most 26 pounds. It contains 10 pounds of gear, and each book weighs 2 pounds. Write an inequality for x books. Are 9 books viable?

ANSWER _____

APPLY IT Show your work

1 You have $68 for an arcade day. Entry costs $20, and each game costs $6. Write an inequality for x games. Are 8 games viable? What is the most you can play?

WORK SPACE

ANSWER _____

2 Your team needs at least $90 for jerseys. It has $18 and earns $9 per car wash. Write an inequality for x washes. Are 7 enough? Find the fewest washes needed.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A movie ticket costs $10, and snacks cost $6 each. You have $46 and must buy at least 2 snacks for the group. Write both inequalities for x snacks. List every viable whole-number value of x.

WORK SPACE AND ANSWER

ANSWER KEY

What Fits?

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A $6 game pass plus $8 per ride must cost no more than $30. Write an inequality for x rides. Are 2 rides viable?	**6 + 8x <= 30; yes, 2 rides cost $22.**
2	A club needs at least $42. It has $14 and earns $7 per sale. Write an inequality for x sales. Are 6 sales viable?	**14 + 7x >= 42; yes, 6 sales bring the total to $56.**
3	A 60-minute playlist has a 12-minute intro and songs lasting 6 minutes each. Write an equation for x songs that fill it. Find x.	**12 + 6x = 60; x = 8 songs.**
4	A bag holds at most 26 pounds. It contains 10 pounds of gear, and each book weighs 2 pounds. Write an inequality for x books. Are 9 books viable?	**10 + 2x <= 26; no, 9 books bring the weight to 28 pounds.**

PART 2 · APPLY IT

1. **20 + 6x <= 68; yes, 8 games are viable; at most 8 games.** Subtract 20 to get 6x <= 48, then divide by 6. Eight games use the full $68.
2. **18 + 9x >= 90; no, 7 washes are not enough; at least 8 washes.** Seven washes bring the total to $81. Solving the inequality gives x >= 8.

CHALLENGE

10 + 6x <= 46 and x >= 2; x = 2, 3, 4, 5, or 6.

Accept equivalent equations and inequalities. For counts of items or activities, viable values must be nonnegative whole numbers.