LESSON MAKER PRO

Model the Limit

Choose the statement that fits the situation.

GRADE 7 · 7.AT.C.7

7.AT.C.7 "Analyze contextual situations to determine whether an equation or inequality best represents the relationship between quantities. Justify the choice based on the context."

NAME _____ DATE _____

EXACT OR LIMITED?

Use an equation when the total must be exact. Use an inequality when the total can be above or below a limit. Words like "at most" and "at least" include the limit, but "less than" does not.

WORKED EXAMPLE

An arcade charges the fees shown. You spend exactly $21. Let x be the number of rounds. Write a model and explain your choice.

ARCADE FEES

Fee	Cost
Entry	$6
Each round	$3

1. The rounds cost 3x dollars.
2. The total cost is 6 + 3x.
3. Exactly $21 means 6 + 3x = 21.

Answer: 6 + 3x = 21. This is an equation because the total is exact.

PRACTICE 4 problems

1 A playlist has x songs, each lasting 4 minutes. It lasts exactly 28 minutes. Write a model and explain your choice.

ANSWER _____

2 A bus holds at most 40 riders. It has 9 riders, and x more get on. Write a model and explain your choice.

ANSWER _____

3 A club needs at least $75. It has $25 and earns $10 per shirt sold. Let x be shirts sold. Write a model and explain your choice.

ANSWER _____

4 A video upload must be under 50 MB. A clip is 14 MB, and each filter adds 2 MB. Let x be filters. Write a model and explain your choice.

ANSWER _____

APPLY IT Show your work

1 You have $18 for game downloads. Each costs $5, and you want at least $8 left. Let x be downloads. Write a model, explain your choice, and find the greatest whole-number x.

WORK SPACE

ANSWER _____

2 Dance entry costs $12, and each snack costs $4. You want to spend less than $33. Let x be snacks. Write a model, explain your choice, and find the greatest whole-number x.

WORK SPACE

ANSWER _____

CHALLENGE One step up

For x months, App A costs $15 plus $7 per month. App B costs $29 plus $5 per month. Write a model for when A costs no more than B. Explain your choice and find all positive whole-number month counts that work.

WORK SPACE AND ANSWER

ANSWER KEY

Model the Limit

GRADE 7 · 7.AT.C.7

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A playlist has x songs, each lasting 4 minutes. It lasts exactly 28 minutes. Write a model and explain your choice.	**4x = 28. The time is exact.**
2	A bus holds at most 40 riders. It has 9 riders, and x more get on. Write a model and explain your choice.	**9 + x <= 40. The number of riders cannot exceed 40.**
3	A club needs at least $75. It has $25 and earns $10 per shirt sold. Let x be shirts sold. Write a model and explain your choice.	**25 + 10x >= 75. Earning more than $75 also meets the goal.**
4	A video upload must be under 50 MB. A clip is 14 MB, and each filter adds 2 MB. Let x be filters. Write a model and explain your choice.	**14 + 2x < 50. The upload must be less than 50 MB.**

PART 2 · APPLY IT

1. **18 - 5x >= 8. "At least" includes $8, so an inequality fits. The greatest whole-number x is 2.** The money left is 18 - 5x. Solving 18 - 5x >= 8 gives x <= 2.
2. **12 + 4x < 33. "Less than" excludes $33, so an inequality fits. The greatest whole-number x is 5.** Solving 12 + 4x < 33 gives x < 21/4. The greatest whole number below 21/4 is 5.

CHALLENGE

15 + 7x <= 29 + 5x. "No more than" includes equal costs, so use <=. Solving gives x <= 7, so the positive whole-number counts are 1, 2, 3, 4, 5, 6, and 7.

Accept equivalent equations or inequalities, including those with the sides reversed. Justifications should connect the comparison symbol to the wording of the situation.