LESSON MAKER PRO

Spot the Pattern

Use structure to make real calculations easier.

GRADE 8 · 8.MP.7

8.MP.7 "Look for and make use of structure."

NAME _____ DATE _____

SEE THE STRUCTURE

When the same group appears again and again, write the group once in parentheses and multiply by the number of groups. You can also make a hard calculation easier by spotting a useful pattern, such as a common factor or a difference of squares.

WORKED EXAMPLE

A library packs 7 prize bags. Each bag has an $18 book and a $2 bookmark. What is the total value of all the prize bags?

1. Each bag has the same value: 18 + 2.
2. Write the repeated groups as 7(18 + 2).
3. Add inside the parentheses: 7(20) = 140.

Answer: $140

PRACTICE 6 problems

1 The robotics club buys 9 sensor packs at $4 each and 9 battery packs at $3 each. Use structure to write one expression and find the total cost.

ANSWER _____

2 A track team practices for 6 days. Each day includes 25 minutes of warm-ups and 35 minutes of drills. Use structure to find the total practice time.

ANSWER _____

3 In each of 8 game rounds, a player earns 15 points but spends 5 points on a power-up. Use structure to find the player's total points after all rounds.

ANSWER _____

4 A student edits 12 video clips. Each clip is 40 seconds long, and the student trims 10 seconds from each clip. Use structure to find the total length of the edited clips.

ANSWER _____

5 A volunteer makes 14 posters. Each poster starts with 6 blue stickers, but 1 sticker on each poster is covered by a label. Use structure to find the number of visible blue stickers.

ANSWER _____

6 A runner fills 11 water bottles with 3/4 liter each, then drinks 1/4 liter from each bottle before the race. Use structure to find how much water remains.

ANSWER _____

APPLY IT Show your work

1 The esports club sells 16 snack vouchers for $5 each and 16 drink vouchers for $4 each. The club spends $19 on digital ads. Use structure to find how much money the club has after paying for the ads.

WORK SPACE

ANSWER _____

2 For a hallway mural, students paint a rectangle that is 32 feet by 21 feet. They leave a 32-foot-by-6-foot strip unpainted for student signatures. Use structure to find the painted area.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A student designs a square pixel-art border for a game poster. The full square is 31 tiles on each side, and a centered square opening is 11 tiles on each side. How many tiles are in the border? Explain how the difference of squares structure helps you avoid calculating both square areas separately.

WORK SPACE AND ANSWER

ANSWER KEY

Spot the Pattern

GRADE 8 · 8.MP.7

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	The robotics club buys 9 sensor packs at $4 each and 9 battery packs at $3 each. Use structure to write one expression and find the total cost.	**9(4 + 3) = $63**
2	A track team practices for 6 days. Each day includes 25 minutes of warm-ups and 35 minutes of drills. Use structure to find the total practice time.	**6(25 + 35) = 360 minutes**
3	In each of 8 game rounds, a player earns 15 points but spends 5 points on a power-up. Use structure to find the player's total points after all rounds.	**8(15 - 5) = 80 points**
4	A student edits 12 video clips. Each clip is 40 seconds long, and the student trims 10 seconds from each clip. Use structure to find the total length of the edited clips.	**12(40 - 10) = 360 seconds**
5	A volunteer makes 14 posters. Each poster starts with 6 blue stickers, but 1 sticker on each poster is covered by a label. Use structure to find the number of visible blue stickers.	**14(6 - 1) = 70 stickers**
6	A runner fills 11 water bottles with 3/4 liter each, then drinks 1/4 liter from each bottle before the race. Use structure to find how much water remains.	**11(3/4 - 1/4) = 11/2 liters**

PART 2 · APPLY IT

1. **$125** Combine the repeated sales first: 16(5 + 4) = 144. Subtract the ad cost: 144 - 19 = 125.
2. **480 square feet** Both areas have a width of 32, so subtract the lengths first: 32(21 - 6). This equals 32(15) = 480 square feet.

CHALLENGE

840 tiles; $31^2 - 11^2 = (31 - 11)(31 + 11) = 20(42) = 840.$

Accept equivalent expressions that correctly show the repeated group or factored structure. For the challenge, accept any correct explanation using $31^2 - 11^2 = (31 - 11)(31 + 11)$.