LESSON MAKER PRO

Pattern Detectives

Build number patterns and find how their terms are related.

GRADE 5 · 5.AT.B.3.a

5.AT.B.3.a "Generate a number pattern that follows a given rule and identify relationships between the numbers within the pattern."

NAME _____ DATE _____

FOLLOW THE RULE

A number pattern follows a rule that tells you how to get from one number to the next. To compare two numbers in the pattern, count the steps between them and use the rule for each step.

WORKED EXAMPLE

Start at 14 and add 9 each time. Write the first five numbers. How much greater is the fifth number than the second?

1. Start with 14. Add 9 to get 23.
2. Keep adding 9 to get 32, 41, and 50.
3. From the second number to the fifth are three steps: 9 + 9 + 9 = 27.

Answer: 14, 23, 32, 41, 50. The fifth number is 27 greater than the second.

PRACTICE 6 problems

1 Start at 2 and add 5 each time. Write the first five numbers. How much greater is the fifth number than the first?

ANSWER _____

2 Start at 60 and subtract 8 each time. Write the first five numbers. How much less is the fifth number than the second?

ANSWER _____

3 Start at 3 and multiply by 2 each time. Write the first five numbers. How many times as great is the fifth number as the third?

ANSWER _____

4 Start at 96 and divide by 2 each time. Write the first five numbers. What fraction of the third number is the fifth number?

ANSWER _____

5 Start at 5 and add 10 each time. Write the first six numbers. What do you notice about their ones digits?

ANSWER _____

6 Start at 1 and add 3 each time. Write the first six numbers. How much greater is each number than the number two places before it?

ANSWER _____

APPLY IT Show your work

1 In a video game, you start with 18 stars. Each level you finish adds 4 stars. List your star totals at the start and after each of the next four levels. How many more stars do you have after level 4 than after level 1?

WORK SPACE

ANSWER _____

2 A reading club reads for 40 minutes on Monday. Each day through Friday, the club reads for 15 minutes more than the day before. List the minutes read each day from Monday through Friday. How many more minutes does the club read on Friday than on Tuesday?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Pattern A starts at 4 and adds 8 each time. Pattern B starts at 8 and adds 16 each time. Write the first five numbers in each pattern. Explain how each number in Pattern B compares with the number in the same place in Pattern A.

WORK SPACE AND ANSWER

ANSWER KEY

Pattern Detectives

GRADE 5 · 5.AT.B.3.a

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Start at 2 and add 5 each time. Write the first five numbers. How much greater is the fifth number than the first?	**2, 7, 12, 17, 22. The fifth number is 20 greater than the first.**
2	Start at 60 and subtract 8 each time. Write the first five numbers. How much less is the fifth number than the second?	**60, 52, 44, 36, 28. The fifth number is 24 less than the second.**
3	Start at 3 and multiply by 2 each time. Write the first five numbers. How many times as great is the fifth number as the third?	**3, 6, 12, 24, 48. The fifth number is 4 times as great as the third.**
4	Start at 96 and divide by 2 each time. Write the first five numbers. What fraction of the third number is the fifth number?	**96, 48, 24, 12, 6. The fifth number is 1/4 of the third.**
5	Start at 5 and add 10 each time. Write the first six numbers. What do you notice about their ones digits?	**5, 15, 25, 35, 45, 55. Every number has a 5 in the ones place.**
6	Start at 1 and add 3 each time. Write the first six numbers. How much greater is each number than the number two places before it?	**1, 4, 7, 10, 13, 16. Each number is 6 greater than the number two places before it.**

PART 2 · APPLY IT

1. **18, 22, 26, 30, 34 stars. After level 4, you have 12 more stars than after level 1.** Add 4 for each completed level. Compare the totals after levels 4 and 1: 34 - 22 = 12.
2. **40, 55, 70, 85, 100 minutes. The club reads 45 more minutes on Friday than on Tuesday.** Add 15 to find each day's reading time. Compare Friday with Tuesday: 100 - 55 = 45.

CHALLENGE

Pattern A: 4, 12, 20, 28, 36. Pattern B: 8, 24, 40, 56, 72. Each number in Pattern B is twice the number in the same place in Pattern A. Pattern B starts at twice Pattern A's starting number and adds twice as much at each step.

Accept equivalent comparisons, such as saying the fifth number in problem 4 is four times smaller than the third if the student also states 1/4 clearly. For the challenge, accept an explanation that checks all five pairs.