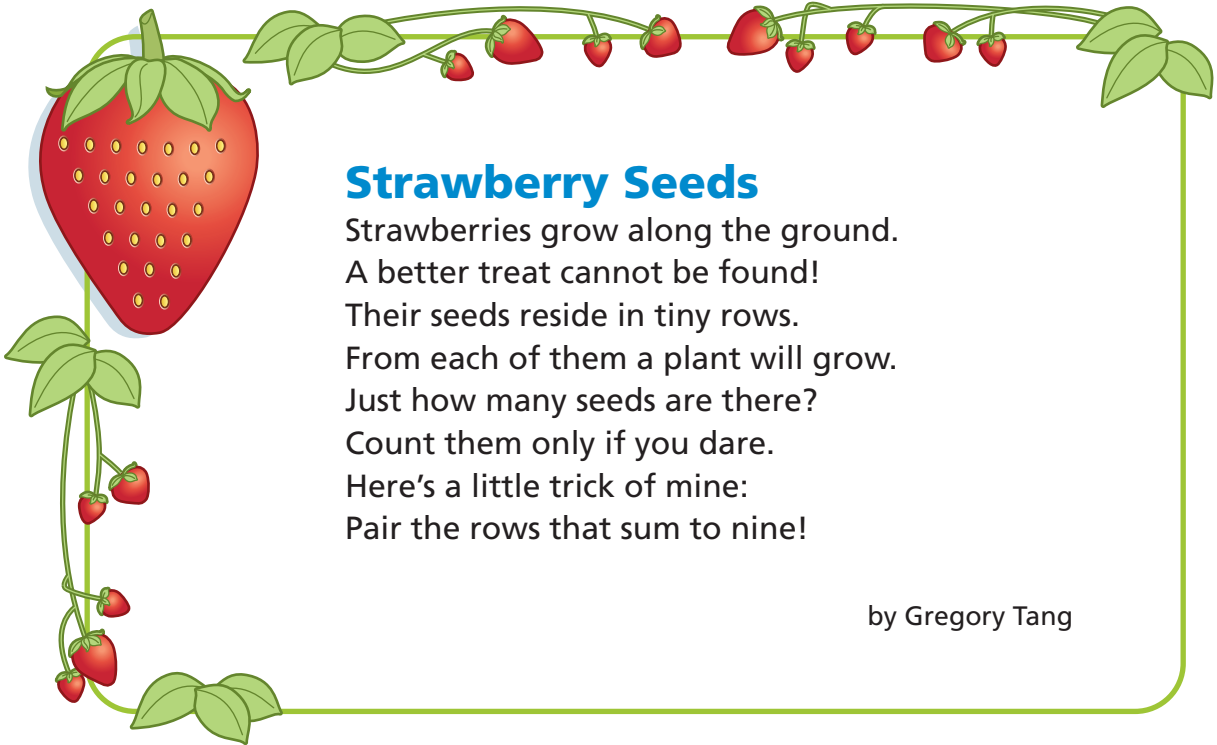# Solving Problems Using Patterns

GOAL

Identify patterns to solve problems.

Strawberry Seeds

Strawberries grow along the ground.
A better treat cannot be found!
Their seeds reside in tiny rows.
From each of them a plant will grow.
Just how many seeds are there?
Count them only if you dare.
Here's a little trick of mine:
Pair the rows that sum to nine!

by Gregory Tang

❓ **How many seeds are shown on the strawberry above?**
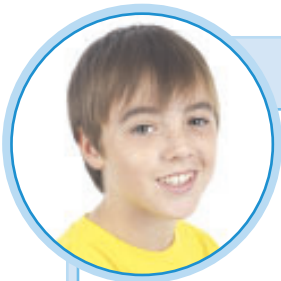
Jay's Solution

Understand

I need to figure out the number of seeds on the strawberry, without counting them one by one.

Make a Plan

I'll use the trick in the poem to try to find a pattern.

Carry Out the Plan

The top row has seven seeds and the bottom row has two seeds.

$7 + 2 = 9$

The middle two rows have five seeds and four seeds.

$5 + 4 = 9$

I predict that the number of seeds in the other two rows will add up to nine as well. I'll check my prediction.

$6 + 3 = 9$

I see a pattern. Each pair adds up to nine.
There are three groups of nine.

$3 \times 9 = 27$

There are 27 seeds shown on the strawberry.

Reflecting

A. How did Jay pair the numbers?

B. Why is finding a pattern a good strategy for solving the strawberry seeds problem?

Checking

1. a) Pair the top and bottom rows of seeds on the strawberry at the left. How many seeds are in these two rows combined?

b) How many rows are shown, in total?

c) How many pairs of rows have the same sum?

d) How many seeds are shown, in total? Write a number sentence to show your work.
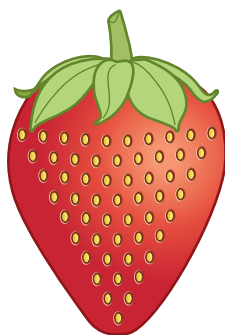
2. How can you use a pairing strategy to calculate
20 + 30 + 40 + 50 + 60 + 70 + 80?
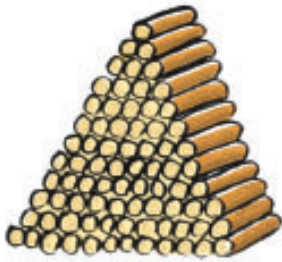
Practising

3. Tara is piling up firewood.
   a) How many logs are in the pile? Make a plan that
      uses a pattern to solve the problem.
   b) Use your plan to determine the number of logs in
      the pile.

4. The sum of the numbers in the pattern 1, 2, 3, … 9, 10
is 55. Predict the sum of the numbers in each pattern
below. Use a pattern to check your prediction.
   a) 2, 4, 6, …18, 20
   b) 11, 12, 13, … 19, 20
   c) 10, 20, 30, … 90, 100

5. Each cup contains the number of coins printed on
the cup.

   1 2 3 4 5 6 7 8 9 10

   a) If the coins are nickels, the pattern for the value of
      the coins is 5, 10, 15, … 50. Calculate the total
      value of the nickels.
   b) Write a pattern for the value of the coins if there
      are dimes in the cups. Calculate the total value.
   c) Write a pattern for the value of the coins if there
      are quarters in the cups. Calculate the total value.

6. Use a pairing strategy to determine the total on the
dice at the left. Show your work.

7. Use a pattern to add the numbers in this expression:
1 + 2 + 3 + 4 + 5 + 6 + … 18 + 19 + 20

8. Create and solve your own question like Question 4
or 7 that can be solved using a pattern.