4-6 Problem Solving: Review of Strategies

Read Plan Solve Check

Objective To solve problems by using a variety of strategies

Problem: Over the five days (Monday–Friday) of a technology expo, Jerry sold 100 copies of his software program. Each day he sold five more copies than he sold the day before. How many copies did Jerry sell each day?

Read to understand what is being asked.

List the facts and restate the question.

Facts: Jerry sold 100 copies of his program over five consecutive days. Each day, he sold 5 more copies than on the previous day.

Question: How many copies did Jerry sell on each of Monday, Tuesday, Wednesday, Thursday, and Friday?

Problem-Solving Strategies

1. Make a Drawing
2. Solve a Simpler Problem
3. Reason Logically
4. Consider Extreme Cases
5. Work Backward
6. Find a Pattern
7. Account for All Possibilities
8. Adopt a Different Point of View
9. Guess and Test
10. Organize Data

Select a strategy.

You can try using the strategy *Reason Logically*. Or, you can attempt to *Solve a Simpler Problem*.

Apply the strategy.

Method 1: Reason Logically

Jerry sold an average of $\frac{100}{5}$, or 20, copies per day.

Think of the average as the number he would have sold each day *if* he had sold the *same number* each day.

- Start by envisioning that Jerry, as shown in the table below, had sold the same number of copies each day.

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Copies Sold	20	20	20	20	20

- "Redistribute," as shown in the table below, the copies to meet the problem criteria—that is, so the number of copies increases by 5 each day. First, take 5 copies from Tuesday and add them to Thursday. Then take 10 copies from Monday and add them to Friday.

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Copies Sold	20 − 10	20 − 5	20	20 + 5	20 + 10

The table below shows the total number of copies is still 100 and the number of copies increases by 5 each day.

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Copies Sold	10	15	20	25	30

So Jerry sold 10 copies on Monday, 15 on Tuesday, 20 on Wednesday, 25 on Thursday, and 30 on Friday.

Method 2: Solve a Simpler Problem

Start by considering an easier problem. Ignore the fact that 100 copies were sold. That is, consider only the fact that 5 more copies were sold each day.

- Begin with *any* first day sale. For example, assume that Jerry sold no copies on Monday. Then you get the following:

Monday:	0 copies
Tuesday:	5 copies
Wednesday:	10 copies
Thursday:	15 copies
Friday:	20 copies

This accounts for $0 + 5 + 10 + 15 + 20$, or 50 copies.

- Now, bring back into play the fact that 100 copies were sold. You must include 50 more copies. Because 50 *divided by* 5 is 10, simply add 10 sales to each day to get:

Monday:	10 copies
Tuesday:	15 copies
Wednesday:	20 copies
Thursday:	25 copies
Friday:	30 copies

- Consider this question:
What would have happened if you had started with a number other than 0 for the first day's sales?

Suppose you had picked 3 instead. Then for each day, Jerry would have the following sales:

Monday:	3 copies
Tuesday:	8 copies
Wednesday:	13 copies
Thursday:	18 copies
Friday:	23 copies

This accounts for 65 copies. You would need to add 35 more copies. Since 35 *divided by* 5 is 7, add 7 copies to each day's sales to get 10, 15, 20, 25, 30.

So Jerry sold 10 copies on Monday, 15 on Tuesday, 20 on Wednesday, 25 on Thursday, and 30 on Friday.

Check to make sure your answer makes sense.

- Is the total number of copies sold 100? $10 + 15 + 20 + 25 + 30 \stackrel{?}{=} 100$
$100 = 100$ ✓

- Do the number of copies sold increase by 5 each day?

$10,\ 15,\ 20,\ 25,\ 30 \rightarrow 10,\ 10 + 5,\ 15 + 5,\ 20 + 5,\ 25 + 5$ ✓

Go to PRACTICE BOOK Lesson 4-6 for exercise sets.