

# The Counting Principle (pages 538–541)

In Lesson 13-2, you learned to find outcomes using a tree diagram. In this lesson, you will learn to use the **Counting Principle** to find the number of possible outcomes.

<b>The Counting Principle</b>	If an event $M$ can occur $m$ ways and is followed by an event $N$ that can occur $n$ ways, then the event $M$ followed by $N$ can occur $m \times n$ ways.
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## EXAMPLE

Yvette can take her driving test on Monday, Wednesday, or Friday, at 4:00 P.M., 5:00 P.M., or 6:00 P.M. How many different opportunities does she have to take her driving test?

$$\underbrace{\text{number of days the test is given}}_3 \times \underbrace{\text{number of times per day the test is given}}_3 = \underbrace{\text{opportunities to take the test}}_9$$

There are 9 opportunities for Yvette to take her driving test.

### Try These Together

**Use the Counting Principle to find the total number of outcomes in each situation.**

- creating new hybrid flowers with short or long petals in either purple, red, or yellow
- baking a yellow, chocolate, strawberry, or vanilla cake frosted with either vanilla, chocolate, cherry, or strawberry frosting

*HINT: Find the number of ways each event occurs, and multiply.*

## PRACTICE

**Use the Counting Principle to find the total number of outcomes in each situation.**

- rolling three six-sided number cubes
- making a sandwich with either wheat or pumpernickel bread, and either salami, turkey, or pastrami, and either mustard, mayonnaise, butter, or horseradish
- Automobiles** Each license plate in a given state contains three letters and three numbers. What is the total number of license plates if the first three characters are letters and the last three characters are digits?



- Standardized Test Practice** Every Social Security card has a nine-digit identification number. How many possible Social Security numbers are there?

**A** 100,000

**B** 1,000,000

**C** 100,000,000

**D** 1,000,000,000

Answers: 1. 6 2. 16 3. 216 4. 24 5. 17,576,000 6. D