

LESSON  
29

# Outcomes of Several Events

**Review It!**

When you find outcomes of several events, remember these words:

**fundamental counting principle** multiply the ways each event can happen to find the way events can happen together

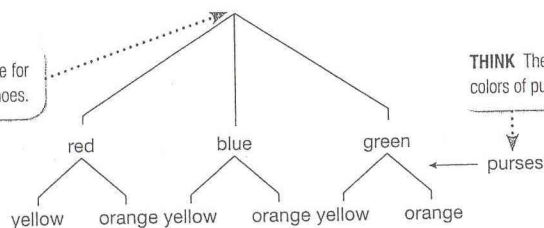
**tree diagram** a way of showing all outcomes of independent events

Lydia Jean has a red pair of shoes, a blue pair of shoes, and a green pair of shoes. She has a yellow and an orange purse. How many different ways can she wear one pair of shoes and one purse?

**Step 1** Make a tree diagram.

There are 3 different colors of shoes, so the tree diagram starts out with 3 branches. Each branch for shoes has 2 branches to show the 2 colors of purses.

**THINK** 3 branches are for 3 different colors of shoes.



**THINK** There are 2 different colors of purses.

**Step 2** Trace each path from top to bottom.

red-yellow, red-orange, blue-\_\_\_\_\_, blue-\_\_\_\_\_, green-\_\_\_\_\_, green-\_\_\_\_\_

**THINK** Each complete path is a different outcome.

There are \_\_\_\_\_ different outcomes.

**THINK** Multiply the number of choices for each event.

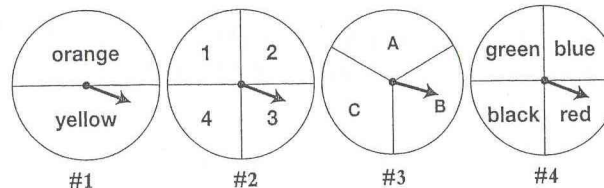
**Step 3** Use the fundamental counting principle to check.

\_\_\_\_\_ pairs of shoes × \_\_\_\_\_ purses = \_\_\_\_\_ different outcomes

So, Lydia Jean has \_\_\_\_\_ different ways she can wear one pair of shoes and one purse.

**Try It!**

Use the spinners to answer questions 1–6.



- How many different outcomes are possible for spinning spinner #1?  
\_\_\_\_\_
- How many different outcomes are possible for spinning spinner #4?  
\_\_\_\_\_
- How many different outcomes are possible for spinning spinner #1 and spinner #2?  
\_\_\_\_\_
- How many different outcomes are possible for spinning spinner #2 and spinner #4?  
\_\_\_\_\_
- How many different outcomes are possible for spinning spinner #2 and spinner #3?  
\_\_\_\_\_
- How many different outcomes are possible for spinning spinner #1 and spinner #4?  
\_\_\_\_\_

1. How many equal parts are there? 1, or 2?

2. How many equal parts are there? 3, or 4?

Use the fundamental counting principle or make a tree diagram to solve.

- In how many different ways can 3 people sit in a row with 3 seats?  
\_\_\_\_\_

7. How many choices does the first person have? 3, or 2?

**On Your Own!**

Circle the best answer for each question.

- A dart tournament gives prizes for first, second, and third place. Three people are left in the tournament. In how many ways can they finish in first, second, and third place?
 

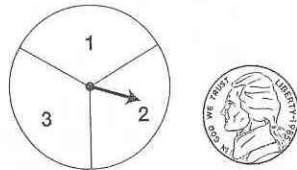
A. 1                      C. 6  
B. 3                      D. 12
- A gardener is planting 4 trees in a row. In how many different orders can he plant the trees?
 

A. 120                    C. 12  
B. 24                     D. 4
- A restaurant offers 8 choices of a main course and 5 different desserts. How many different ways can you order a main course and a dessert?
 

A. 5                        C. 13  
B. 8                        D. 40
- In how many different ways can Paul arrange 5 pictures in a line on the wall?
 

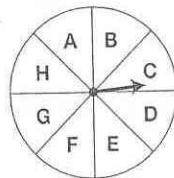
A. 720                    C. 24  
B. 120                    D. 5

- How many different outcomes are possible for spinning this spinner and tossing this coin?



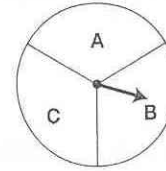
- A. 2                      C. 6  
B. 3                      D. 9
- How many outcomes are possible for tossing a quarter and rolling a number cube labeled 1–6?
 

A. 12                    C. 6  
B. 8                      D. 2
  - How many different outcomes are possible for rolling a number cube labeled 1–6 and spinning this spinner?



- A. 8                      C. 36  
B. 14                    D. 48

- The spinner below is divided into 3 equal parts.



**Part A** List all the possible outcomes for spinning the spinner twice.

**Part B** How many outcomes are possible if you spin the spinner three times?

**Math Words**

Fill in the blanks.

- If you multiply the number of ways that each different event can happen and get the number of ways the events can happen together you use the \_\_\_\_\_.
- You can show all the ways that two events can happen together in a \_\_\_\_\_.