

The Counting Principle

Key

The Counting Principle is an easy way to find out how many different outcomes are possible. To use the Counting Principle, simply multiply the number of possibilities of each.

Ex. 1: Pizza Crust - thin or thick 2

Toppings - peperoni, sausage, or mushroom 3

$$2 \cdot 3 = (6)$$

Ex. 2: The Smoothie Yogurt shop sells chocolate, strawberry, and vanilla yogurt in a small, medium, or large dish. The Shop adds lemon as a NEW flavor. What is the number of possible combinations with the new flavor?

$$4 \cdot 3 = (12)$$

Try these examples on your own.

1. Ashley places 5 cards, 3 envelopes, and 2 stickers on a table. Which equation shows the number of possible outcomes?

a. $5 + 3 + 2 = 10$

b. $5 + (3 \times 2) = 11$

c. $(5 + 3) \times 2 = 16$

d. $5 \times 3 \times 2 = 30$

$$5 \cdot 3 \cdot 2$$

2. Katie has 3 skirts, 2 pairs of jeans, 3 shirts, and 2 sweaters. How many different outfits can be made? If you add the fact that she has 2 different pairs of shoes, how will that affect the number of possible outfits?

$$3 \cdot 2 \cdot 3 \cdot 2 = 36$$

W/ the shoes, she would have double the # of outfits $36 \cdot 2 = 72!$ wow!

3. A movie theater sells 3 sizes of popcorn (small, medium, and large) with 3 choices of toppings (no butter, butter, and extra butter). How many possible ways can a bag of popcorn be purchased?

$$3 \cdot 3 = 9$$

4. New York State issues license plates consisting of letters and numbers. There are 26 letters and the letters may be repeated. There are 10 digits and the digits may be repeated. How many possible license plates can be issued with two letters followed by three numbers?

$$\underbrace{26 \cdot 26}_{2 \text{ letters}} \cdot \underbrace{10 \cdot 10 \cdot 10}_{\text{numbers}} = 676,000 \text{ wow!}$$

5. The ice cream shop offers 31 flavors. You order a double-scoop cone. In how many different ways can the clerk put the ice cream on the cone if you wanted two different flavors?

$$31 \cdot 30 = \underline{\underline{930}} \text{ wow!}$$

6. Lara stands in line for lunch. She can choose spaghetti or pizza. She can also have apple juice, orange juice, or milk. How many different combinations of one meal and one drink can she choose?

$$2 \cdot 3$$

A. 2

B. 3

C. 5

D. 6

7. Information about girls' ice skates:

- Colors: white, beige, pink, yellow, blue 5
- Sizes: 4, 5, 6, 7, 8 5
- Extras: tassels, striped laces, bells 3

Assuming that all skates are sold with ONE extra, how many possible outcomes exist?

$$5 \cdot 5 \cdot 3 = \underline{\underline{75}}$$