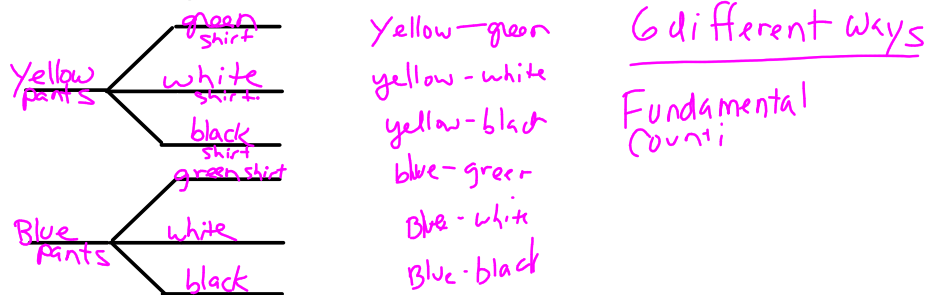


FUNDAMENTAL COUNTING PRINCIPLE:

If there are m ways that one event can occur and n ways that another event can occur then there are $(m)(n)$ ways that both events can occur.

Example 1: Make a tree diagram showing the number of different ways a person could wear a pair of pants and shirt if you are choosing from Yellow or Blue pants and a Green, White or Black shirt.



Example 2: use the **FUNDAMENTAL COUNTING PRINCIPLE** to verify your answer.

$$\begin{array}{l} \# \text{ ways} \\ \text{pants} \end{array} \cdot \begin{array}{l} \# \text{ ways} \\ \text{shirts} \end{array} \\ 2 \cdot 3 = 6$$

Example 3:

A password consists of 2 letters followed by 3 digits.

a) How many possible passwords can be chosen?

$$\begin{array}{l} \text{letter} \quad \text{letter} \quad \text{digit} \quad \text{digit} \quad \text{digit} \\ 26 \cdot 26 \cdot 10 \cdot 10 \cdot 10 = \boxed{676,000} \end{array}$$

b) How many would there be if you could not repeat letters or digits?

$$\begin{array}{l} \text{letter} \quad \text{letter} \quad \text{digit} \quad \text{digit} \quad \text{digit} \\ 26 \cdot 25 \cdot 10 \cdot 9 \cdot 8 = \boxed{468,000} \end{array}$$

c) How many would there be if you could not use vowels and could not use the number 0?

$$\begin{array}{l} a, e, i, o, u \text{ vowels} \\ 26 - 5 = 21 \end{array}$$

$$\begin{array}{l} \text{letter} \quad \text{letter} \quad \text{digit} \quad \text{digit} \quad \text{digit} \\ 21 \cdot 21 \cdot 9 \cdot 9 \cdot 9 = \boxed{321,489} \end{array}$$

Example 4:

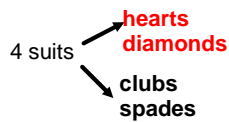
How many seven digit phone numbers can be formed if the first digit is a 6, the second digit is a 2 or 6 or 7 and the third digit cannot be a 0.

$$\begin{array}{ccccccc} 6 & \frac{2+6+7}{3} & \frac{1-9}{9} & - & \frac{0-9}{10} & \frac{0-9}{10} & \frac{0-9}{10} & \frac{0-9}{10} \\ 1 & \cdot 3 & \cdot 9 & \cdot & 10 & \cdot 10 & \cdot 10 & \cdot 10 \end{array}$$

270,000

Information about a deck of cards:

52 cards in a deck



13 cards in each suit: 2,3,4,5,6,7,8,9,10,J,Q,K, A

face cards