Suppose that you have 3 shirts and two pairs of pants. How many outfits can you make?

Red → white          6 outfits

Green                 3 × 2

Black → Blue
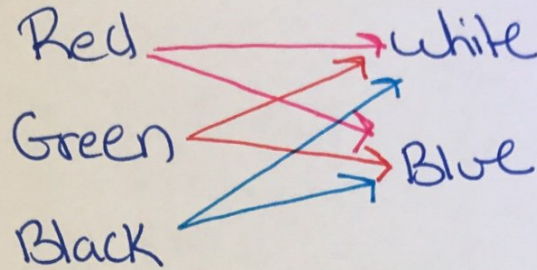
Fundamental Counting Principle – If an even occurs in m ways and a second even occurs in n ways, then the two events occur in mxn ways.

1) An ice cream store offers 3 types of cones and 31 flavors. How many single scoop cones can be made?

$$3 \times 31 = 93$$

2) In a certain state automobile license plates display 3 letters followed by 3 digits.

   a. How many license plates are possible if repetition of letters and digits is allowed?

$$\underset{L}{26} \times \underset{L}{26} \times \underset{L}{26} \times \underset{\#}{10} \times \underset{\#}{10} \times \underset{\#}{10} = 17,576,000$$

   b. How many license plates are possible if repetitions of letters is not allowed but repetition of digits is allowed?

$$\underset{L}{26} \times \underset{L}{25} \times \underset{L}{24} \times \underset{\#}{10} \times \underset{\#}{10} \times \underset{\#}{10} = 15,600,000$$

3) In how many ways can a race with 6 runners be completed?

$$\underset{}{6} \times 5 \times 4 \times 3 \times 2 \times 1 = 720$$