# *Practice*

1) There are 6 people in a race.  In how many ways can they finish first, second or third ?

2) A golfer has 4 different hats, 3 gloves and 2 pairs of shoes to pick from for his round of golf.  In how many ways can he make his choices ?

3) In Canada, postal codes consist of 6 characters --  three letters and three digits.  Each postal code starts with a letter and alternates with a digit.
   a.  How many postal codes are there ?
   b.  How many start with the letter S ?
   c.  How many start with the letter S and end in the digit 8 ?
   d.  How many start with the letter S, digit 6 and NO letter or digit is repeated ?

4) Using the digits  { 1 , 2 , 3 , 4 , 5 }, how many positive three digit integers can be made if:
   a.  there are NO restrictions
   b.  it is odd and repetition is allowed ?
   c.  it is odd and repetition is NOT allowed ?
   d.  Repeat question a, b and c if the digits you can choose are  { 0 , 1 , 2 , 3 , 4 , 5 }.

5) In how many ways can ALL of the letters of the word TRAVEL be arranged if:
   a.  there are NO restrictions ?
   b.  it must start with T ?
   c.  it starts with a consonant and ends in a vowel ?
   d.  the letters TR must stay together ?

6) How many positive even three-digit integers less than 400 can be formed from the digits  { 0 , 1 , 2 , 3 , 4 , 5 }  if:
   a.  repetition is allowed ?
   b.  No digit is repeated ?

7) You are ordering dinner at a restaurant. How many ways can you order a meal if you have two choices for a drink ( coffee or tea ), three main courses to choose from ( chicken, beef, or fish ) and two desserts ( pie or cake ) ?
   a. Draw a tree diagram
   b. Use the fundamental counting principle

8) Eight sprinters are in the final of a race. How many different ways there to award the gold, silver and bronze medals ?

9) Television stations in Canada usually have call letters that are 4 letters long and begin with the letter C. If the CRTC made this a law in Canada, then how many television stations could the CRTC license ?

10) Repeat the above question using the restriction, repetition of letters is NOT allowed

11) Some license plates consist of 3 letters followed by 3 numbers. How many different license plates are possible if:
   a. if there are NO Restrictions
   b. if the letters must be DIFFERENT
   c. if the letters are different and the first digit can't be 0

12) How many two digit whole numbers can be formed using the digits: 0,1,2,4,6,7,8,9 ( 8 digits ) ?
   a. Repetitions are allowed
   b. Repetitions are not allowed

13) An ice cream parlor features 64 flavors and 20 toppings, in 3 sizes. How many different sundaes can be made ?

14) How many EVEN two digit numbers are there ?

15) How many EVEN two digit numbers can be made using the digits 1 , 2 , 3, 4, 5, 6, 7, 8 ?
    a. Repetitions are not allowed
    b. Repetitions are allowed

16) How many two digit numbers can be formed using the digits 0 , 2 , 4 , 6 , 8 if:
    a. Repetitions are allowed
    b. Repetitions are not allowed

17) How many ODD four digit numbers can be made from all of the digits, if:
    a. Repetition is allowed
    b. Repetition is not allowed

18) In how many ways can all of the letters of the word PROBLEM be arranged ?

19) In how many ways can all of the letters of the word PROBLEM be arranged if the arrangement must start with a consonant and end in a vowel ?

20) How many ways can the letters in the word PENCIL be arranged?

21) If there are four different types of cookies, how many ways can you eat all of them?

22) If three albums are placed in a multi-disc stereo, how many ways can the albums be played?

23) How many ways can you order the letters in KEYBOARD if K and Y must always be kept together?

24) How many ways can the letters in OBTUSE be ordered if all the vowels must be kept together?

25) How many ways can 4 rock, 5 pop, & 6 classical albums be ordered if all albums of the same genre must be kept together?

**HW: MC 4,10,20**