

NAME:  
DATE:

CMT: COUNTING and PROBABILITY LESSON 2 – Combinations and Permutations: NOTES

**Key Words and Characteristics**

<b><u>Combinations</u></b>	<b><u>Permutations</u></b>

**Examples:**

1. The board of directors of the CMT Corporation has 12 members. In how many ways can one choose...

a. 4 officers (Pres, VP, Treas. and Sec.)

b. a delegation of 4 members where all members have equal standing?

2. There are 11 horses entered in a race. In how many ways can one pick...

a. the top three finishers regardless of order?

b. the first-, second-, and third-place finishers in the race?

3. There are 25 college football teams in KOJO Alaska.

a. How many Top 10 rankings are possible?

b. How many ways are there to choose 5 teams to buy their mini helmets?

**You Try:** Determine whether the situation is a combination or permutation, then write the notation.

Situation	Combination (C) or Permutation (P) (write the notation)
The number of ways to completing a classroom seating chart for a class of 24	
Number of ways to create a batting order of 9 players for the 24 players on the New York Yankees	
Number of ways to choose six outfits from fourteen outfits to be modeled	
Number of ways to choose four tennis players form a group of nine	
Number of ways to select eight toppings for ice cream out of 14	
Number of ways for first, second and third chairs for six clarinets in a band	
Number of ways 10 people can sit at a table	
Number of ways to hang 5 paintings in 3 places on the wall	
Number of ways to choose a president and a vice president from the members of a club	
Number of ways to choose two representatives from your class of 24	
Number of ways to choose four cards from a deck of cards	
Number of ways to choose five different cookies for dessert if there are 8 choices	
Number of ways to choose four math textbooks from a shelf in the library from	
Number of ways to choose 5 different toys from the toy box and the way they are chosen is the order they will be played with	
Number of ways to choose 5 people in gym to play on the same basketball team out of 24 people	
Number of ways to choose the letters in the word RYAN to be used as passwords	

4. A class has 15 female and 10 male students.

a. The office calls and asks the teacher to send down three students to help hang up signs. How many different groups of three students can the teacher send?

b. The office calls and asks the teacher to nominate three students for president, vice president, and secretary. How many ways can the teacher select these positions?

c\*. The office calls and asks the teacher to send down 6 females and 4 males to help hang up signs. How many different groups can be selected?

5. Twelve students are on a basketball team.

a. You want to select a captain and an assistant captain. How many ways can you select these members?

b. You select five of the twelve to receive the sportsmanship award. How many different group choices can you make?

c\*. A starting line-up consists of 5 players: a center, two point guards, and two forwards. On the team there are three centers, four guards and five forwards. How many different starting line ups can be constructed?

6. How many letter arrangements can be formed from the word "MATH"?