**Intro to Geometry** (HSS-CP.B.9)
**Unit Six: Probability Fundamental Counting Principle (IC5)**

Name: _____Key_____
Date: _____ Period: _____

**FUNDAMENTAL COUNTING PRINCIPLE**

If you can choose one item from a group of M items and a second item from a group of N items, then the total number of two items choices is M • N.

Ex: a) A girl has four skirts and six blouses. How many different skirt-blouse combinations can she wear?

4 * 6 = 24

b) If the girl also has three sweaters, how many skirt-blouse-sweater combinations can she wear?

4 * 6 * 3= 72

c) If eight basketball teams are in a tournament, in how many different ways could the first, second, and third place team be decided? (No ties allowed.)

8 * 7 * 6 = 336

1. In a race with 10 horses, the first, second, and third place finishers win three different prizes. How many ways could the prizes be awarded?

10 * 9 * 8 = 720

2. How many three-digit numbers can be formed from the digits 1, 2, 3, 4, and 5 if repetitions of digits are:

a) not allowed

5 * 4 * 3 = 60

b) allowed

5 * 5 * 5 = 125

3. In a certain state, automobile license plates start with one letter of the alphabet , followed by five digits which can be selected from the numbers 0 through 9. Find how many license plates are possible if:

a) repetition of numbers is allowed

26 * 10 * 10 * 10 * 10 * 10 = 2,600,000

b) repetition of numbers is not allowed

26 * 10 * 9 * 8 * 7 * 6 = 782,240

c) the first digit following the letter can't be zero and repetition is allowed

26 * 9 * 10 * 10 * 10 * 10 = 2,340,000

d) the first digit following the letter can't be zero and repetition is not allowed

26 * 9 * 9 * 8 * 7 * 6 = 707,616

4. A row of six seats in a classroom needs to be filled by selecting individuals from a group of 10 students.

a) In how many different orders could the students sit down?

10 * 9 * 8 * 7 * 6 * 5 = 151,200

b) If there are six boys and 4 girls and the students need to alternate gender when they sit down, how many different seating arrangements are there?

6 * 4 * 5 * 3 * 4 * 2 = 2,880 or 4 * 6 * 3 * 5 * 2 * 4 = 2,880…so 5,760

5. If a short quiz has five true/false questions, how many different ways could the quiz be filled out?

2 * 2 * 2 * 2 * 2 = 32

6. If a lock on a safe requires making a 4 digit code and the numbers 0 through 9 can be used, how many different codes are possible if:

a) all digits must be different

10 * 9 * 8 * 7 = 5,040

b) digits can be repeated

10 * 10 * 10 * 10 = 10,000

c) the code must start with a 9 and end with a 4 and digits can be repeated

1 * 10 * 10 * 1 = 100

d) the 7 key is broken and digits must all be different

9 * 8 * 7 * 6 = 3024