#### Counting Principles (how do we count a sample space?)

#### Independent Events

(the outcome of the second event does not depend on the outcome of the first event)

## Find the sample space of rolling a number cube 2 times

112131415161122232425262132333435363142434445464152535455565162636465666

Fundamental **Counting Principle** If event 1 can occur *n* ways and event 2 can occur *m* ways, then the number of ways both events can occur is  $n \bullet m$ 

The local deli has 5 choices of meat, 3 cheeses, 4 dressings, and 8 other toppings for their sandwiches. How many different sandwiches with one meat, one cheese, one dressing, and one other topping can you order?



#### How many zip codes are possible in the United States

(pretend a zip code cannot start with a 0 or 1)?



Did you know that ZIP stands for Zone Improvement Plan? How many ways can you create a security code that starts with a letter and is followed by 3 digits? Digits can repeat.

#### What if the event is

## dependent?

If the event is dependent, we must first decide if

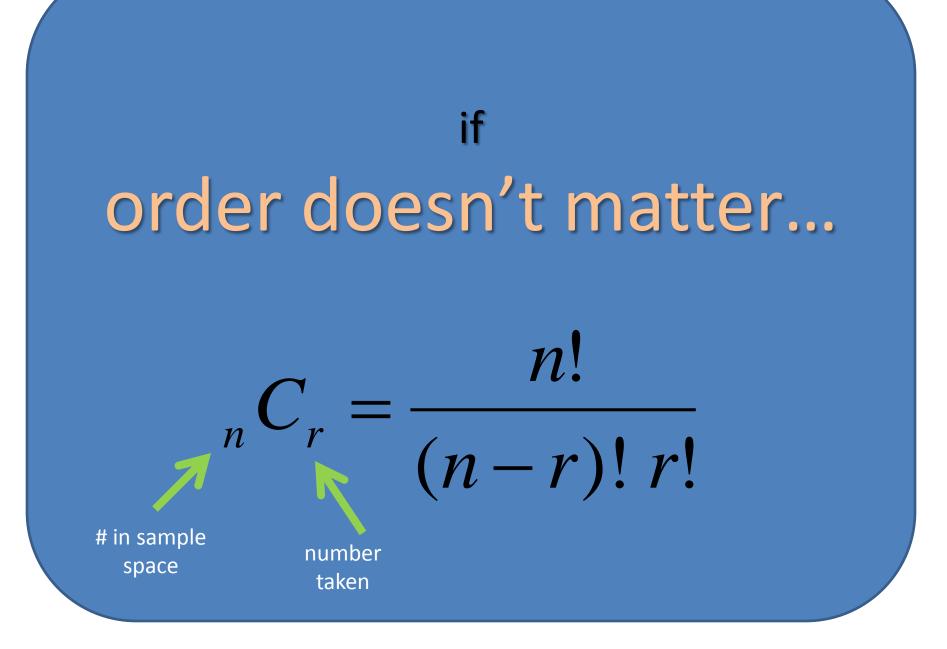
order matters

#### order matters then use

if

#### permutations

### if order doesn't matter then use combinations

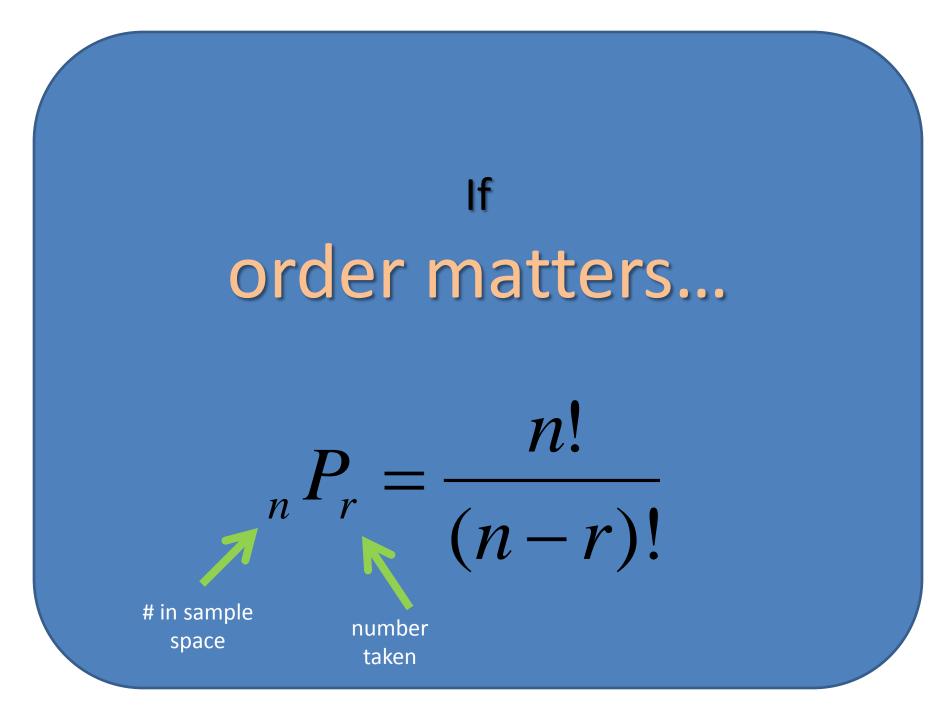


Selecting a group of 4 students from 26



Picking five girls for a dance number from 17 who auditioned.

Picking 3 pieces of candy from a bag of 30 different types.



Selecting a Vice President and President from a class of 30.



# Rearranging the letters in TUESDAY



Selecting 2 leads for the school musical and 2 supporting characters from the 22 students who tried out.

# what's in a name?

