

# Dependent Events

---

Name: \_\_\_\_\_ Date: \_\_\_\_\_

How can probabilities be calculated when events are dependent on one another?

## Dependent Events

To calculate the probability of two dependent events, A and B, occurring, multiply the probability that A occurs by the conditional probability that B occurs, given that A occurred.

$$P(A \cap B) = P(A) \times P(B|A)$$

## Conditional Probability

Probability of a second event occurring, given that a first event occurred. The sample space for the second event is reduced from the first event.

### Important Point between Independent and Dependent events:

- **With** replacement: the events are Independent (the chances don't change)
- **Without** replacement: the events are dependent (the chances change)

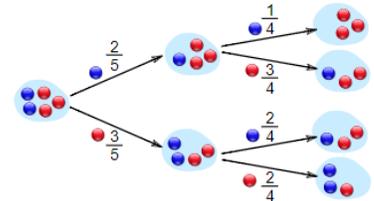
### Examples:

1. A bag contains 5 marbles. 2 are blue and 3 are red. You select two marbles, one after the other...

a) Calculate the chances of drawing 2 blue marbles.

b) Calculate the chances of drawing a blue marble and then selecting a red marble.

c) Calculate the chances or selecting **at least one** blue.



2. A purse contains four \$5 bills, five \$10 bills and three \$20 bills. Two bills are selected without the first selection being replaced. Find  $P(\$5 \text{ then } \$5)$
  
3. It is known that 70% of your friends like Chocolate ice-cream, and 35% of your friends like Chocolate AND Strawberry. Calculate the percentage of your friends that like Chocolate also like Strawberry.

### Questions:

Check your answers and get hints at: <http://bit.ly/2lmgPbB>

1. A bag contains 9 blue marbles and 3 red marbles. Two marbles are drawn at random. Calculate the probability of getting:
  - a) two red marbles?
  
  - b) one red marble and one blue marble?
  
  - c) two blue marbles?
  
2. A bag contains 15 beads. Six are black and the rest are white. Two beads are drawn at random. Calculate the probability of getting:
  - a) both beads black.
  
  - b) both beads white.
  
  - c) at least one white bead.

