

Probability Terms

1) Sample Space - The set of all possible outcomes in an experiment.

		Coin 1	
		H	T
Coin 2	H	HH	TH
	T	HT	TT

	1	2	3	4	5	6	
1	2	3	4	5	6	7	Sum 2 dice
2	3	4	5	6	7	8	
3	4	5	6	7	8	9	
4	5	6	7	8	9	10	
5	6	7	8	9	10	11	
6	7	8	9	10	11	12	

2) Event - The process of making a single observation in an experiment.

3) Independent - Given 2 events, E and F, the chances of E ~~occurring~~ ^{occurring} is unaffected by F.

4) Dependent - Given 2 events, E and F, the chances of E occurring is affected by the outcome of F.

5) Probability - The ratio of favorable outcomes of an event to the total number of outcomes in the sample space.

*Success - A favorable outcome

Probability of flipping 2 coins and getting 2 tails.

	H	T
H	HH	HT
T	TH	TT

$\frac{1}{4}$ ← success

4 ← # in sample space.

6) Complement - Given an event E , the set of outcomes in the sample space ~~is~~ that is not E .

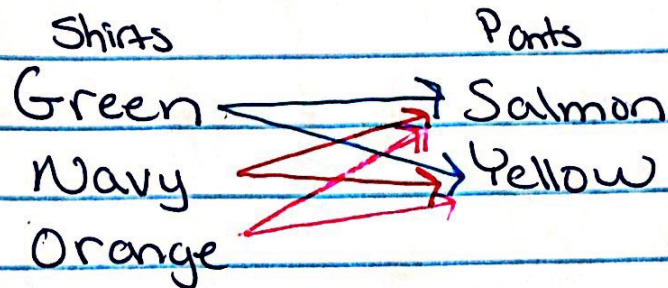
Complement to getting 2 tails is not getting 2 tails.

$\frac{3}{4}$ ← not 2 tails

4 ← # in sample space

Fundamental Counting Principle

Suppose you have 3 shirts and 2 pairs of pants. How many outfits can you make?



6 outfits

$$3 \times 2 = 6$$

Fundamental Counting Principle -

If the first event occurs (m) times and a second event occurs (n) times, then the 2 events occur in $m \times n$ ways.

- 1) An ice cream store offers 3 types of cones and 31 flavors. How many single scoop ice cream cones are possible?

$$\begin{array}{ccc} 3 & \times & 31 & = & 93 \\ \text{cones} & & \text{flavors} & & \end{array}$$

2) In a certain state automobile license plates display 3 letters followed by 3 digits.

a) How many plates are possible if repetition of letters and digits is allowed?

$$\frac{26}{L} \times \frac{26}{L} \times \frac{26}{L} \times \frac{10}{\#} \times \frac{10}{\#} \times \frac{10}{\#}$$

17,576,000 plates

b) How many plates are possible if repetition of letters is not allowed?

$$\frac{26}{L} \times \frac{25}{L} \times \frac{24}{L} \times \frac{10}{\#} \times \frac{10}{\#} \times \frac{10}{\#}$$

15,600,000 plates

3) In how many ways can a race with 6 runners be completed?

$$\frac{6}{1st} \times \frac{5}{2nd} \times \frac{4}{3rd} \times \frac{3}{4th} \times \frac{2}{5th} \times \frac{1}{6th}$$

720 ways