Basic Probability:

Probability is the measure of the likelihood that an event will occur.

Ways to find out probabilities:

Suppose you have a bag with 10 dice, and 4 of them are green.

If you pull of a die at random, what's the probability that you will draw a green die?

A. Empirically (Experimentally): Do a bunch of tests and tally up how many times you get a green die.

Green Die	Not Green	Total Trials
𝍸 |	𝍸	𝍸 𝍸

The probability that you will get green is P(green) = $\frac{\#\ of\ times\ you\ got\ green}{\#\ of\ trials}$ = $\frac{6}{10} = .60\ or\ 60\%$

The more trials you do, the better results you'll get.

B. Theoretically (with math): P(of an event) = $\frac{\#\ of\ ways\ the\ event\ can\ occur}{\#\ of\ possible\ events}$

So P(green) = $\frac{\#\ of\ green\ dice}{\#\ of\ dice\ total}$ = $\frac{4}{10} = .40\ or\ 40\%$

Why are they different? The experimental probability will approach the value of the theorectical probability, but you have to do the experiment many, MANY times.

Basic Rules of Probability:

1. Probability of a certain event: P(you draw any color die) = 1 or 100%

2. Probability of an impossible event: P(purple die) = 0 or 0%

All probabilities will lie somewhere between these two extremes.

3. The complement of an event: Let's define "A" as the event: "drawing a green die".

The complement of A is denoted, ~A or A' or A^c , and represents the event "not drawing a green die".

Probability that something will happen = P(green die) + P(not a green die) = P(A) + P(~A) = 1

Odds: Odds are calculated a little differently than probability.

Probability of drawing green = $\frac{\#\ of\ green\ dice}{\#\ of\ dice\ total}$ = $\frac{4}{10}$

Odds of drawing green = $\#\ of\ green\ dice : \#\ of\ dice\ total = 4 : 6$

Ex: Find the	Probability	&	Odds:
a. When flipping a coin: having tails showing?	$\frac{1}{2}$		1 : 1
b. When rolling die: getting an even number?	$\frac{3}{6} = \frac{1}{2}$		3 : 3
c. When drawing a card from a deck: getting a heart?	$\frac{13}{52} = \frac{1}{4}$		13 : 39