Vocabulary: Binomial Probabilities



**Vocabulary**

* Binomial coefficient – the number of unordered ways to choose *r* objects from a set of *n* objects.
	+ The binomial coefficient also describes the number of ways to order *r* successes in *n* trials of a binomial experiment.
	+ Notations for the binomial coefficient include *nCr*, *C*(*n*, *r*), **, and .
		- This is expressed as “*n* choose *r*.”
	+ The formula for the binomial coefficient is *nC*r = .
		- For example, 3*C*2 =  =  = 3, because there are three ways to order two successes in three trials: *SSF*, *SFS*, and *FSS*.
* Binomial experiment – an experiment that consists of independent trials in which each trial has two possible outcomes.
	+ Flipping a coin (heads or tails) and shooting a free throw (make or miss) are examples of binomial experiments.
* Factorial – the product of an integer and all positive integers below it.
* The symbol for factorial is the exclamation point (!).
	+ For example, 5! = 5 • 4 • 3 • 2 • 1 = 120.

1

1 1

1 2 1

1 3 3 1

1 4 6 4 1

1 5 10 10 5 1

* By convention, 0! = 1.
* Pascal’s Triangle – a triangular array of binomial coefficients.
	+ Each term in Pascal’s Triangle is obtained by adding the two terms diagonally above it.
		- For example, the “3” in the fourth row is the sum of the “1” and “2” terms above it.
* Tree diagram – a diagram that uses branches to show the different possible outcomes of an experiment or set of experiments.
	+ For example, the tree diagram to the right shows the possible outcomes of two binomial trials in which each trial can end in success (*S*) or failure (*F*). The possible outcomes are: *SS*, *SF*, *FS*, and *FF*.