**11.2 Probability**.  
Objective: To find the probability of an event using theoretical, experimental, and simulation methods

**Probability:** the likelihood an event will occur indicated by a number between 0 and 1

(Can be written as a fraction, decimal, or percentage)

* 1 = will always occur
* 0 = will never occur

**Simulation:** a model of events, used to estimate experimental probability

**Sample Space:** set of all possible outcomes to an experiment or activity

**Equally likely outcomes:** when each outcome in a sample space has the same chance occuring

**Experimental Probability:**

The number of times an event occurs compared to the number of trials;

Example:

Flip a coin 10 times and record the amount of times you get tails.

What do you find? How does it compare to what you’d expect?

Example:

Roll a die 30 times and record the amount of times each number shows up.

What do you find? How does it compare to what you’d expect?

**Theoretical Probability:**

The probability that an event will occur can be represented by;



Example:

*You roll a six-sided die whose sides are numbered from 1 through 6. Find the probability of:*

*1) Rolling a 4*

*2) Rolling an odd number*

*3) Rolling a number less than 7*

Example:

*A jar contains 2 red marbles, 3 blue marbles, and 1 green marble. Find the probability of randomly drawing the given type of marble.*

*1) A red marble 2) A green marble*

*3) A blue or a green marble 4) A red or a blue marble*

Example

*You put a CD that has 8 songs in your CD player. You set the player to play the songs at random. The player plays all 8 songs without repeating any song.*

*a) What is the probability that the songs are played in the same order they are listed on the CD?*

*b) You have 4 favorite songs on the CD. What is the probability that 2 of your favorite songs are played first, in any order?*

**Geometric Probability:**

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