Probability

<u>Lesson One:</u>

Khan Academy video: https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-probability-statistics/cc-7th-basic-prob/v/basic-probability

* The probability of an event, written *P(event)*, is the measure of how likely an event is to occur.

*A simple event has a single outcome.

*A compound event is two or more simple events.

*Experimental Probability: A ratio of the number of times an outcome occurs to the total amount of trials performed.

Jack flipped a coin 5 times, and these are his results: heads, tails, tails, tails, heads

Jack's experimental probability of getting tails in this experiment is $\frac{3}{5}$.

*Theoretical Probability: A mathematical calculation that an event will happen in theory. It is used to find the probability of an event when all outcomes are equally likely.

Jack flipped a coin. The outcome of flipping a coin is heads or tails. In theory, the probability of getting heads is $\frac{1}{2}$ and the probability of getting tails is $\frac{1}{2}$.

Learnzillion video: https://learnzillion.com/lessons/1859-analyze-independent-and-dependent-events

*You can make <u>predictions</u> based on theoretical probability.

If Jack flips a coin 10 times, theoretically he will get tails 5 times and heads 5 times.

$$10 \ x \ \ \frac{1}{2} = \ 5$$

Learnzillion video: https://learnzillion.com/lessons/1387-predict-the-frequency-of-an-event-using-the-theoretical-probability

*Probability is measured between 0 and 1. You can write probability as a fraction, decimal, or a percent.

The probability scale
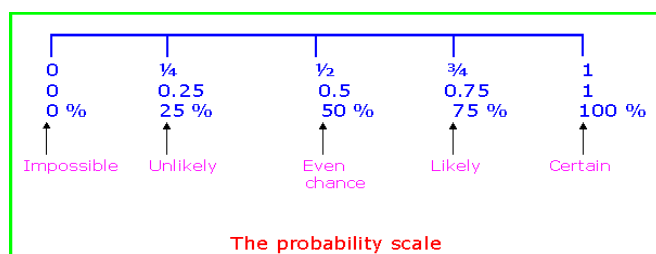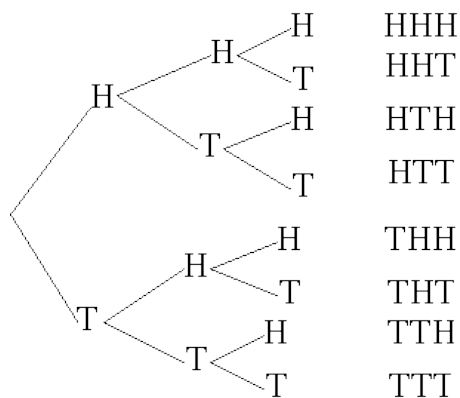
Lesson Two:

*Sample Space – Lists all the possible outcomes of an experiment.

Sally flipped two coins. The sample space would be: HH   HT   TH   TT

You can use a <u>tree diagram</u> to show a sample space.

Khan Academy video: https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-probability-statistics/cc-7th-compound-events/v/tree-diagram-to-count-outcomes

Sally flipped a coin 3 times. The tree diagram shows the sample space.

```
              H     HHH
          H <
              T     HHT
      H <
              H     HTH
          T <
              T     HTT

              H     THH
          H <
              T     THT
      T <
              H     TTH
          T <
              T     TTT
```

*Fundamental Counting Principle – States that you can find the total number of outcomes for two or more experiments by multiplying the number of outcomes for each separate experiment.

George wants to order ice cream. He will pick one flavor and one topping. The store offers 3 flavors and 2 toppings. George must choose whether he wants a cup, waffle cone, or sugar cone. There are 18 possible outcomes for George to choose from.

3 flavors x 2 toppings x 3 containers = 18 possible outcomes

*Simulation is a way to model random events, such that simulated outcomes closely match real-world outcomes.

Watchknowlearn video:
http://www.watchknowlearn.org/Video.aspx?VideoID=17900&CategoryID=4794

Lesson 3:

LearnZillion video: https://learnzillion.com/lessons/1859-analyze-independent-and-dependent-events

*Independent Events: When the occurrence of one event has no effect on the probability that a second event will occur.

If Erika rolls two number cubes, will getting a 3 on the first number cube affect the results of the second number cube? NO – these are independent events.

*Dependent Events: When the occurrence of one event does have an effect on the probability that a second event will occur.

If Erika has 10 green and 10 blue socks in a drawer, and pulls one green sock out and keeps it out, will it affect the probability of pulling a second green sock out of the drawer? YES – these are dependent events. Erika has a 10/20 probability of pulling the first green sock out of the drawer. If she keeps it out of the drawer and tries to pull another green sock out of the drawer, she will have a 9/19 probability for the second event.

*Compound Events – When two independent or dependent events must happen in a particular order.

Sarah is going to roll a fair number cube and then spin a spinner that is divided into four equal sections labeled red, yellow, green, and blue. What is the probability that she will get a 1 on the number cube, followed by a green space on the spinner?

$P(1, green) = \frac{1}{6} \ x \ \frac{1}{4} = \frac{1}{24}$

Khan Academy Video: https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-probability-statistics/cc-7th-compound-events/v/compound-probability-of-independent-events

Additional Resources:

**Parent Guide: http://www.hallco.org/boe/site/wp-content/uploads/2014/03/Parent-Unit-6-Guide-for-7th-Grade-Math.doc

**Georgia Virtual Learning (please go to the link, scroll to the bottom, then click on "Probability"):
http://www.gavirtuallearning.org/Resources/SharedMS7thMath.aspx