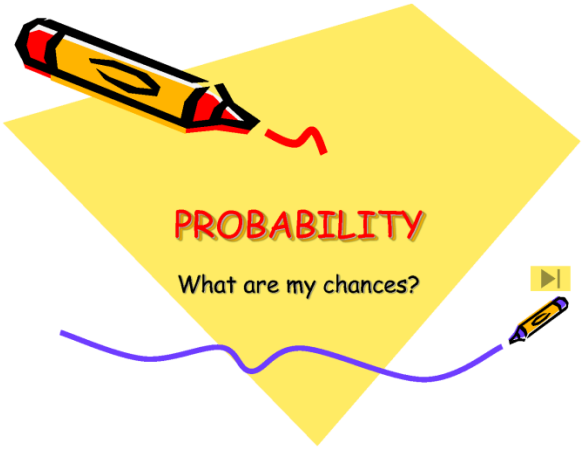
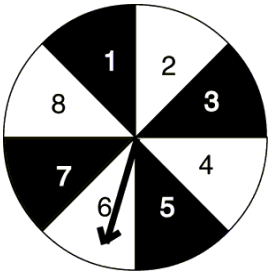
Probability

Instructions: Read aloud and highlight the notes on probability. Then, complete the activity sheets. Be sure to show your work neatly in pencil. You may use a calculator and ruler, when needed.





Probability

What is probability?

Probability is the chance of an event happening. Probabilities are expressed as **fractions, decimals, percents, and ratios.**

Fraction	Decimal	Percent	Ratio
$\frac{2}{5}$	**0.4**	**40%**	**2:5**

For example, look at the picture below.

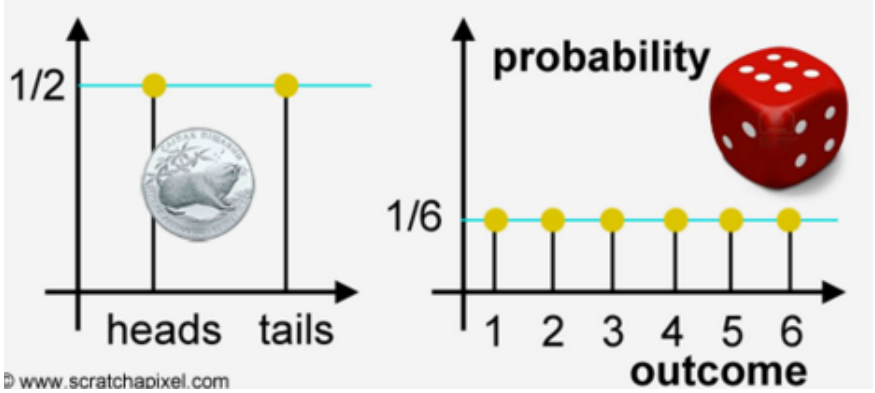
There is an impossible chance of rolling a fourteen because the dice only have six sides. There is an even chance of landing on heads with a coin toss. There is a certain chance that the sun will rise.

What is an outcome?

An outcome is a possible result of an experiment.

For example:

- There are two possible outcomes in a coin toss; heads or tails (H,T).
- There are six possible outcomes when rolling the dice; one to six (1, 2, 3, 4, 5, 6).



Probability

What is a favorable outcome?

A favorable outcome is a successful result in an experiment. Count the number of favorable outcomes and divide by the total number of possible outcomes to find the probability.

Probability (event) = favorable outcome / possible outcomes

For example:

What is the probability of spinning a number 2 on the spinner?

Probability (spinning a 2) = favorable outcome = 1 / possible outcomes = 6

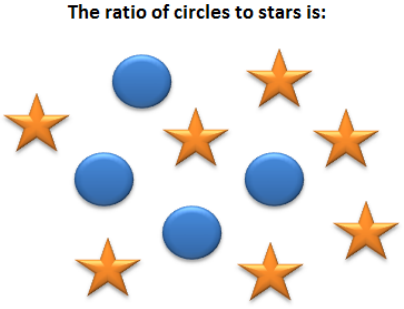
Feel free to use abbreviations. See below.

P (2) = $\frac{1}{6}$

What is a ratio?

A ratio is a comparison of two numbers where one part is compared to the whole part.

For example:



4 to 7 OR 4:7 OR $\frac{4}{7}$

Ratios can be expressed in three forms:

1. Word Form: 4 to 7

2. Ratio Notation Form: 4:7

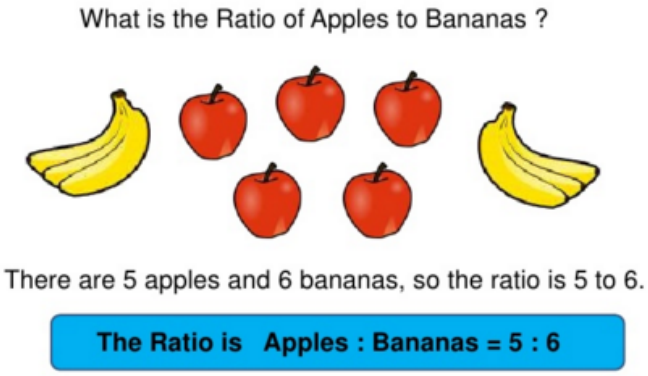
3. Fraction Form: $\frac{4}{7}$

Probability

What is ratio notation?

Ratio notation is when a colon (:) is used to separate one part from the whole part in a ratio.

For example:

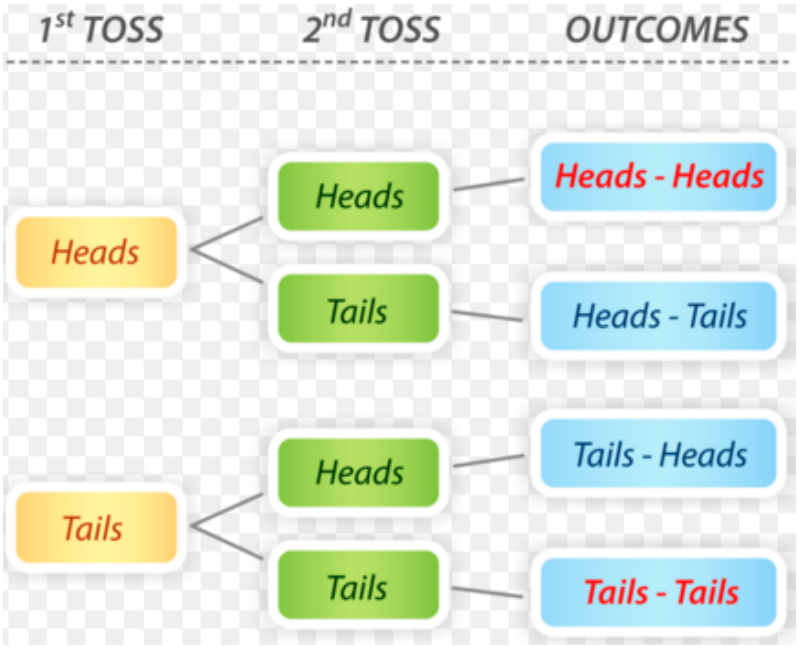


What is a tree diagram?

A tree diagram is a diagram used to organize the outcomes of an experiment.

For example:

This is a tree diagram for a coin toss with two tosses. The first coin toss has two possible outcomes, heads or tails. The second coin toss also has two possible outcomes, head or tails. Notice that a tree diagram uses "branches" to separate the first coin toss from the second coin toss.



Probability

What is a table?

A table is a diagram used to list all the possible outcomes of an experiment. A table can also be used to organize the outcomes of an experiment.

For example, this is a table displaying the data from the coin toss example.

		Second toss	
		H	T
First toss	H	HH	HT
	T	TH	TT

What is a sample space?

A sample space is a list of all the possible outcomes of an experiment. When items are listed in a sample space they are organized in ordered pairs.

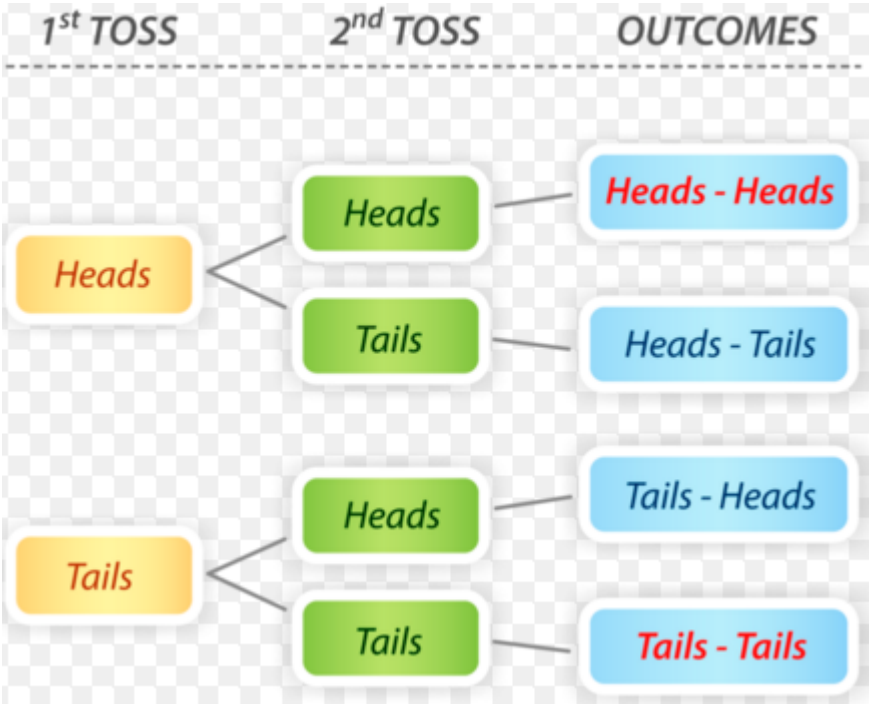
For example, this is the sample space for the coin toss example.

1st Coin Toss **2nd Coin Toss**

(Heads, Heads), (Heads, Tails) **(Tails, Heads), (Tails, Tails)**

or you can use abbreviations

(H, H) , (H, T) , (T, H) , (T, T)



Probability

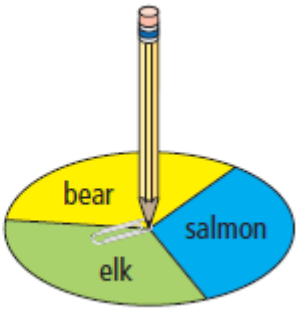
What are independent events?

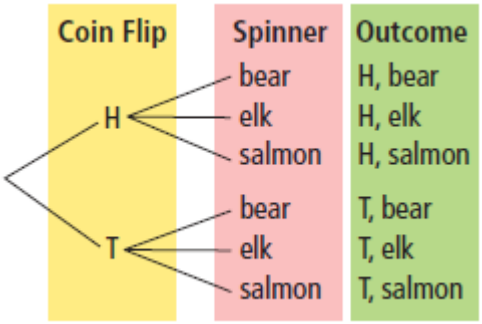
Independent events take place when the outcome of one event does not affect the outcome of the other event.

For example:

The probability of flipping a coin and spinning a spinner has no effect on the outcome of the other.

See below in the following tree diagram and sample space.





The sample space is (H, bear), (H, elk), (H, salmon), (T, bear), (T, elk), (T, salmon).

Probability

Review for Assignment

Instructions: Read aloud and highlight the key terms in bold.

1. **Probability:** Probability is the chance of an event happening.
2. **Outcome:** An outcome is a possible result of an experiment.
3. **Favorable Outcome:** A favorable outcome is a successful result in an experiment.
4. **Possible Outcomes:** Possible outcomes are the total number of outcomes in an experiment.
5. **Ratio:** A ratio is a comparison of two numbers where one part is compared to the whole part.
6. **Ratio Notation:** Ratio notation is when a colon (:) is used to separate one part from the whole part in a ratio.
7. **Tree Diagram:** A tree diagram is a diagram used to organize the outcomes with branches for each possible outcome of an experiment.
8. **Table:** A table is a diagram used to list all the possible outcomes of an experiment.
9. **Sample Space:** A sample space is a list of all the possible outcomes of an experiment organized in ordered pairs.
10. **Independent Events:** Independent events take place when the outcome of one event does not affect the outcome of the other event.

Probability

Instructions: Match the definitions in column A with the key terms in column B.

Column A	Column B
1._____ The chance of an event happening.	A. Table
2._____ One possible result of an experiment.	B. Outcome
3._____ A successful result in an experiment.	C. Sample Space
4._____ The outcome of one event that does not affect the outcome of the other event.	D. Tree Diagram
5._____ A list of all the possible outcomes of an experiment organized in **ordered pairs**.	E. Independent Events
6. _____ A diagram used to **organize** outcomes with **branches** for each possible outcome of an experiment.	F. Probability
7._____ A diagram used to **list** the possible outcomes.	G. Favorable Outcome
8. _____ The total number of outcomes.	H. Possible Outcomes
9._____ A comparison of two numbers where one part is compared to the whole part.	I. Ratio
10.____ When a colon (:) is used to separate one part from the whole part in a ratio.	J. Ratio Notation

Instructions: Fill in the blanks with the appropriate key terms.

1. The chance of an event happening is called _____.
2. Probability is the number of _____ outcomes divided by the number of _____ outcomes.
3. _____ take place when the outcome of one event does not effect on the outcome of the other event.
4. A _____ can be used to **organize** the outcomes with **branches** for each possible outcome in an experiment.
5. When all the possible outcomes are **listed in ordered pairs** it is called the _____.
6. A _____ is a comparison of two numbers.
7. Ratio notation is when a _____ is used to separate one part from the whole part in a ratio.
8. A _____ is used to **list** all the events of an experiment.