3-17-17

Aim: SWBAT get introduced to probability AND SWBAT determine the experimental probability an event and make a prediction based on the results.

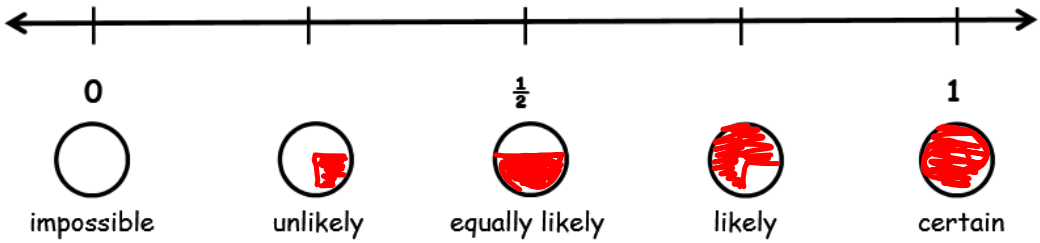
Do Now: Quiz

HW: Finish worksheets

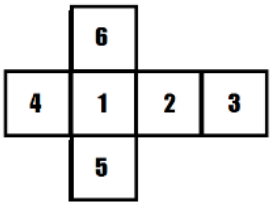
Introduction to Probability

Probability is the possibility that an event will occur.

Answers to probability questions can be described with words and/or numbers.



1. On a standard number cube, there are 6 **outcomes** or possible results of the **event** that can occur when it is tossed.



Outcome	Numbers that are part of the outcome	Probability
Number less than 10	1,2,3,4,5,6	certain
Number 7		impossible
Even number	2,4,6	equally likely
Factor of 12	1,2,3,4,6	more likely than not
Number 5 or 6	5,6	less likely than likely

2. The names Jessica, Joshua, Jill, and Jimmy are written on slips of paper. The slips of paper are placed in a bag. One name is picked.

Probability	Outcome
Impossible	choosing a name that doesn't start with J
Certain	choosing a J name
As likely as not	choosing a boys name
More likely than not	choosing a name with an I in it

Introduction to Probability

3. A bag has 24 marbles: 6 green, 6 red, and 12 blue. Lucy reaches into the bag and picks out 1 marble.

Probability	Outcome
Impossible	choosing a yellow marble
Certain	choosing green, red, or blue
As likely as not	choosing a blue
More likely than not	choosing a red or blue
Less likely than likely	choose a red

4. Imagine that these cards are face down, and you pick one.

Probability	Outcome
0	Picking a D
1	A, B, or C
$\frac{1}{2}$	Picking A
Between 0 and $\frac{1}{2}$	Picking B
Between $\frac{1}{2}$ and 1	Picking A or B

5. A weatherman in Seattle says there is a 75% chance of rain. A weatherman in Tacoma says there is a $\frac{1}{4}$ chance of rain. In which city is it more likely to rain? Explain how you know.

Seattle, because 75% is greater than 25%.

6. For each number shown, describe the probability in words.

0 _____

$\frac{7}{8}$ _____

$\frac{1}{3}$ _____

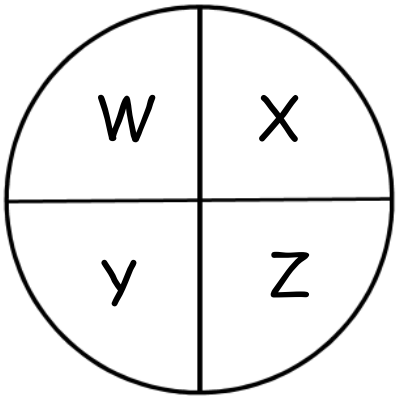
1 _____

$\frac{1}{2}$ _____

Homework

Introduction to Probability

1. Kelly said that because there are four equal-sized sections on the spinner below, the probability of the spinner landing on X is as likely as not.



Explain why Kelly is wrong.

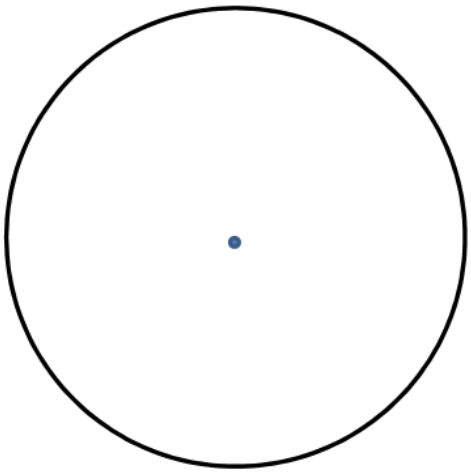
2. Construct a spinner with the following characteristics:

It is certain to land on blue, yellow, green, or red.

It is twice as likely to land on red than green.

It is equally likely to land on blue or green.

It is more likely to land on yellow than not land on yellow.



Experimental Probability

1. Toss a coin 50 times and tally your results.

Each time you tossed a coin, you conducted an experiment. In probability, we call an experiment a **trial**. The result of the trial is the **outcome**.

You tossed the coin 50 times, so you completed 50 **trials**.

The **outcome** of each trial was either "heads" or "tails".

The notation **P(outcome)**, is used to represent the probability of getting an outcome. In the case of tossing the coin, we would write **P(heads)** to represent the probability of tossing a coin that lands on "heads" and **P(tails)** to represent the probability of tossing a coin that lands on "tails".

Each outcome can be represented as a ratio that compares the outcomes of the experiment to the number of trials.

P(heads)	P(tails)
$\frac{\#\ of times\ the\ coin\ landed\ on\ heads}{number\ of\ trials} = \frac{27}{50}$	$\frac{\#\ of\ times\ the\ coin\ landed\ on\ tails}{number\ of\ trials} = \frac{23}{50}$

Each probability is based on the results of your experiment. If you repeated your experiment, you would likely get proportional results. You can use this proportional relationship to predict the number of times a coin would land on "heads" and "tails" if a coin was tossed 500 times.

A coin landing on "heads"	A coin landing on "tails"
$\frac{27}{50} = \frac{h}{500}$ $\frac{50h}{50} = \frac{13500}{50}$ $h = 270$	$\frac{23}{50} = \frac{t}{500}$ $\frac{50t}{50} = \frac{11500}{50}$ $t = 230$

You can use this proportional relationship to predict the number of times a coin would land on "heads" and "tails" if a coin was tossed 1000 times.

A coin landing on "heads"	A coin landing on "tails"
$\frac{27}{50} = \frac{h}{1000}$ $\frac{50h}{50} = \frac{27000}{50}$ $h = 540$	$\frac{23}{50} = \frac{t}{1000}$ $\frac{50t}{50} = \frac{23000}{50}$ $t = 460$

Experimental Probability

2. Roll a number cube and record the results in a frequency table.

Number Rolled	Tally	Number of Times Rolled
1	𝍸 ||	7
2	|||	3
3	𝍸	5
4	|||	3
5	|||	~~3~~ 4
6	𝍸 |	

Total: 25

Probability ratios using words.

$$P(\text{rolling a } 1) = \frac{\text{number of 1s rolled}}{\text{number of rolls}}$$

$$P(\text{rolling a } 2) = \frac{\text{number of 2s rolled}}{\text{number of rolls}}$$

$$P(\text{rolling a } 3) = \frac{\text{number of 3s rolled}}{\text{number of rolls}}$$

$$P(\text{rolling a } 4) = \frac{\text{number of 4s rolled}}{\text{number of rolls}}$$

$$P(\text{rolling a } 5) = \frac{\text{number of 5s rolled}}{\text{number of rolls}}$$

$$P(\text{rolling a } 6) = \frac{\text{number of 6s rolled}}{\text{number of rolls}}$$

Probability ratios using numbers.

Fraction	Decimal	Percent
$P(1) = \frac{7}{25}$	0.28	28%
$P(2) = \frac{3}{25}$	0.12	12%
$P(3) = \frac{5}{25}$	0.20	20%
$P(4) = \frac{3}{25}$	0.12	12%
$P(5) = \frac{3}{25}$	0.12	12%
$P(6) = \frac{4}{25}$	0.16	16%

HW

Experimental Probability

Write and solve a proportion to predict the results.

1. The number of 1s rolled in 250 rolls.

$\frac{7}{25} = \frac{x}{250}$

2. The number of 2s rolled in 250 rolls.

3. The number of 3s rolled in 250 rolls.

4. The number of 4s rolled in 250 rolls.

5. The number of 5s rolled in 250 rolls.

6. The number of 6s rolled in 250 rolls.

*7. How many times did an odd number occur in the original experiment? _____

*8. Use your answer to #7 to predict how many times an odd number will occur in 3000 trials.

9. In the cafeteria, there are 7 teachers, 48 girls, and 45 boys. What is the probability that the next person who enters the cafeteria is a boy?

A. $\frac{9}{20}$ B. $\frac{11}{20}$ C. $\frac{9}{11}$ D. $\frac{1}{3}$