

Definition: Probability is concerned with events of chance or uncertainty.
 Probabilities are normally and usually represented as fractions e.g. $2/3$ or $4/5$

Scale of Probability:		Impossible	Maybe	Certain
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0	Low	$1/2$	High	1

Sample Space (Universe of Event)

A listing or diagram of all possible outcomes from an experiment or occurrence.
 Specific Event (Subset of Universe)
 Simple (single event) or Non-Simple (multiple events) of chance.

Types of Probabilities for an Experiment (Event) of Chance or Uncertainty.
 P = Probability * = Not P* = Not Probability

Probability Experiment: Tossing a Die onto a table or the floor.	Since a Die is a <u>Cube</u> with 6 faces: 1, 2, 3, 4, 5, 6
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Probability of Success = (Success / Total) Probability of Failure* = (Failure / Total)*

$P(2) = 1/6$	$P(\text{Odd}) = 3/6$	$P(N < 5) = 4/6$
$P^*(2) = 5/6$	$P^*(\text{Odd}) = 3/6$	$P^*(N < 5) = 2/6$
$P(R) \cup P^*(R) = 1$		$P(R) \cap P^*(R) = 0$

The Sum of P and P* equals 1.

The intersection of P and P* equals 0.

Definition: Odds represents the probability of an event occurring and/or happening.

Definition: Odds is the Ratio of the (Probability of Success) / (Probability of Failure)

Odds are normally and usually represented as ratios e.g. 2:3 or 2 to 3

Summary of Odds: Die Experiment Tossing a Die with 6 faces onto floor.	Since a Die is a <u>Cube</u> with 6 faces: 1, 2, 3, 4, 5, 6
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Simple Example of the Odds for the above Experiment of Chance or Uncertainty.
Odds represent a ratio of Probabilities. Odds can later be reduce as ratios.

Odds in favor of Two event: $O_f(N=2) = 1/6 : 5/6 = 1 \text{ to } 5$

Odds against Two event: $O_a(N=2) = 5/6 : 1/6 = 5 \text{ to } 1$

Odds in favor of Odd event: $O_f(N \text{ is Odd}) = 3/6 : 3/6 = 3 \text{ to } 3 \text{ or } 1 \text{ to } 1 \text{ (Even)}$

Odds against Odd event: $O_a(N \text{ is Odd}) = 3/6 : 3/6 = 3 \text{ to } 3 \text{ or } 1 \text{ to } 1 \text{ (Even)}$

Odds in favor of N<5 event: $O_f(N<5) = 4/6 : 2/6 = 4 \text{ to } 2 \text{ or } 2 \text{ to } 1$

Odds against N<5 event: $O_a(N<5) = 2/6 : 4/6 = 2 \text{ to } 4 \text{ or } 1 \text{ to } 2$

Reference for this information from Fundamentals of Mathematics by Edwin I. Stein