

probability-- A number that represents how likely an event is to happen.

- Probabilities range from 0% to 100%, or 0 to 1
- A probability of 0% indicates that the outcome is impossible.
- A probability of 100% indicates that the outcome must occur.
- Probabilities are usually expressed as a ratio or percent, but can be expressed as a decimal

$$P(\text{event}) = \frac{\# \text{ of desired (or successful) outcomes}}{\# \text{ of possible outcomes}}$$

Note: P() is read "The probability of..." {the event happening}.

Example

The probability of rolling doubles using two dice is:

$$P(\text{doubles using two dice}) = \frac{6}{36} = \frac{1}{6} \text{ or } 50\%$$

Theoretical probability--A calculated probability based on the possible outcomes when each outcome has the same chance of occurring. It is calculated using the formula a below.

$$\text{Theoretical probability} = \frac{\# \text{ of desired (or successful) outcomes}}{\# \text{ of possible outcomes}}$$

Experimental probability--A probability based on data collected (in experiments). It is calculated using the formula a below.

$$\text{Experimental probability} = \frac{\# \text{ of desired (or successful) outcomes in the experiment}}{\# \text{ of possible outcomes in the experiment}}$$

Sample space--All possible outcomes of a situation (such as heads and tails when flipping a coin)

Outcome--any possible or actual result of the action considered (such as landing on heads or landing on tails when flipping a coin)

Event--A desired or successful outcome or group of outcomes from an experiment, (such as landing on heads as desired when flipping a coin).

Compound Probability--the likeliness of two independent events occurring. The compound probability is equal to the probability of the first event multiplied by the probability of the second event.

“With replacement”– generally refers to throwing the object picked (from a bag/hat/etc.) back into the bag before drawing again.

“Without replacement”– generally refers to keeping the object picked (from a bag/hat/etc.) out of the bag and then drawing again.