

# [Probability - lab report example](https://assignbuster.com/probability-lab-report-example/)

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## Probability

Probability Probability defines an event’s chance of occurrence and may be theoretical or experimental. While theoretical probability relies on naturally expected observations, experimental probability is derived from experimental observations. This report seeks to investigate probabilities in genetics and inheritance. The paper concludes that theoretical probability sufficiently predicts inheritance of genes.   
Introduction   
Olofsson explains that the knowledge of probability is fundamental in understanding inheritance of genes (p. 56). This is because characteristics of parents that are passed over to their offspring follow specific patterns. Both parents have pairs of chromosomes out of which one is transferred to an offspring at random. An offspring therefore, independently, and randomly, derives one of each pair of chromosomes from each of the parents. Probability therefore helps to understand chances and possibilities of genetic compositions of offspring based on their parents’ genetic compositions (Olofsson, p. 56).   
This paper seeks to investigate probabilities of outcomes of events in tossing two sided coins. The paper will explore and compare the experimental and theoretical probabilities from tossing the coins for conclusions over inheritance of genes.   
Methods   
The experiment was conducted by repeatedly flipping a coin. With twenty events, observations were made for head, tail, and frequencies recorded. The experiment was repeated with two simultaneous tosses and pairs of observations recorded.   
Results   
The results of the first set of experiment are summarized in the table bellow   
Student’s results for single experiment   
Heads   
Tails   
Total   
Number   
Observed frequency   
5/20   
15/20   
20/20   
Expected frequency   
1/2   
1/2   
1   
Results for paired ‘ two-coin flips’   
Coin A   
Coin B   
Observed number   
Observed frequency   
Expected frequency   
Head   
Head   
3   
3/20   
¼   
Head   
Tail   
7   
7/20   
¼   
Tail   
Head   
4   
4/20   
¼   
Tail   
Tail   
6   
6/20   
¼   
Total   
20   
20/20   
1   
The combined observations for the class experiments are also shown below:   
Class results for single flips   
Heads   
Tails   
Total   
Number   
Observed frequency   
39/80   
41/80   
80/80   
Expected frequency   
40/80   
40/80   
1   
Class results for ‘ two-coined flips’   
Coin A   
Coin B   
Observed number   
Observed frequency   
Expected frequency   
Head   
Head   
21   
21/80   
¼   
Head   
Tail   
23   
23/80   
¼   
Tail   
Head   
17   
17/80   
¼   
Tail   
Tail   
19   
19/80   
¼   
Total   
80   
80/80   
1   
If the head-tail observations in the double flips were made without regard to the order, then the table of results would be as follows   
Student’s results   
Coin A   
Coin B   
Observed number   
Observed frequency   
Expected frequency   
Head   
Head   
3   
3/20   
¼   
Head   
Tail   
11   
11/20   
½   
Tail   
Tail   
6   
6/20   
¼   
Total   
20   
20/20   
1   
Class results   
Coin A   
Coin B   
Observed number   
Observed frequency   
Expected frequency   
Head   
Head   
21   
21/80   
¼   
Head   
Tail   
40   
40/80   
½   
Tail   
Tail   
19   
19/80   
¼   
Total   
80   
80/80   
1   
Discussion   
Results, as reported from individual observations, differ from expected frequencies though they are evenly distributed across expected frequencies. The combined class observations however converge towards the expected frequencies. This means that the genetic probabilities that can be derived from outcomes of the coins converge to theoretical probabilities when a large number of events are considered. Probability therefore significantly explains inheritance of genes.   
Conclusion   
The results of the experiment indicate that probability distributions can be used to predict and explain inheritance of genes.   
Works cited   
Olofsson, Peter. Probability, Statistics, and Stochastic Processes. New Jersey, NJ: John Wiley & Sons, 2011. Print