

# [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