

- Flip your lid
- Law of Large Numbers



Objectives

- Content: I will experiment with probability to see a pattern and a probability principle.
- Social: I will participate in the "flip your lid" lab.
- Language: I will clearly answer the questions and discuss my observations with my partner, classmates and teacher.



When we start to work with probability, we need to define the event we call a "success". You have flipped coins before, and success is either a head or tail. Now we are flipping lids, we need to decide what success is on our flip - rim up or down.

Define success = $\underline{rim} down$ Predict the probability of a success (between 0 and 1): $\underline{O_{\circ} 4}$

Now start flipping. Document on the graph the cumulative proportion of success (how many successes out of the total flipped so far).



Estimate the probability of your event: _____

How did that compare to your prediction? To others?



Discuss Results



The Law of Large Numbers

First a definition . . .

- When thinking about what happens with combinations of outcomes, things are simplified if the individual trials are independent.
 - Roughly speaking, this means that the outcome of one trial doesn't influence or change the outcome of another.
 - For example, coin flips are independent.



The Law of Large Numbers

- The Law of Large Numbers (LLN) says that the long-run relative frequency of repeated independent events gets closer and closer to a single value.
- We call the single value the probability of the event.
- Because this definition is based on repeatedly observing the event's outcome, this definition of probability is often called empirical probability.
 how this "flipping illustrated them"





The Nonexistent Law of Averages

- The LLN says nothing about short-run behavior.
- Relative frequencies even out only in the long run, and this long run is really long (infinitely long, in fact).
- The so called Law of Averages (that an outcome of a random event that hasn't occurred in many trials is "due" to occur) doesn't exist at all.

Homework

Notes from Chapter 14



