

## Experimental vs. Theoretical Probability

**Theoretical Probability** – What **should** happen in theory

*(This is what we've been doing all along)*

Example: What's the Probability of flipping tails on coin?

$$P(\text{tails}) = \frac{1}{2} \text{ or } 50\%$$



**Experimental Probability** – What **actually** happens when you conduct an experiment

Example: You flip a coin 100 times and it lands on tails 40 times

$$P(\text{tails}) = \frac{40}{100} = \frac{2}{5} \text{ or } 40\% \quad (\text{you actually flipped a coin})$$

### **Compare the theoretical probability to the experimental probability**

I should have gotten tails 50% of the time, but I actually flipped tails 40% of the time. I got tails less than expected.

**\*\*YOU WILL NOW COMPLETE YOUR OWN EXPERIMENT USING the website:**

<https://wheeldecide.com/>

Steps:

1. Click Modify Wheel (you'll need to scroll down)
2. Type the following colors:
  - Blue
  - Yellow
  - Red
  - Green
3. Click Apply Wheel Changes

Complete the worksheet on the next page.

Name \_\_\_\_\_  
Math \_\_\_\_\_ Period \_\_\_\_\_

Date \_\_\_\_\_  
Experimental vs. Theoretical WS

1. What is the theoretical probability of each color? *Write your answer as a fraction in simplest form AND a percent.*

P(Blue) \_\_\_\_\_

P(Yellow) \_\_\_\_\_

P(Red) \_\_\_\_\_

P(Green) \_\_\_\_\_

2. Predict what color you will spin the most. \_\_\_\_\_

3. Is this a fair spinner? Why or why not? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

4. Spin the wheel 40 times and record your outcomes in the table below (use tallies)

Blue	Yellow	Red	Green

5. What was the experimental probability of each color? *Write as a fraction in simplest form AND as a percent.* (Remember you spun the spinner 40 times, so that is your denominator)

Blue \_\_\_\_\_

Yellow \_\_\_\_\_

Red \_\_\_\_\_

Green \_\_\_\_\_

6. Is what you thought would happen, what actually happened? \_\_\_\_\_

7. Why is the theoretical probability different from the experimental probability? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_