Probabilities Stations

You will be evaluating games of chance to help you understand probability.

For each game, make a prediction AS A CLASS for what outcome will occur the most frequently. Perform the experiment 10 times. Record the actual outcomes on the first row labeled "Experiment." After conducting the experiment 10 times, place a checkmark under any outcomes that matched your prediction.

Before you begin, we will decide as a class our predictions for most frequent outcomes...

Station 1 Experiment: Flip a coin

Prediction for most frequent outcome (Circle one):   (Heads (H))   or   Tails (T)

Experiment	H	H	T	H	T	T	T	H		
Place a ✔ under any outcome that matched your Prediction	✔	✔		✔				✔		

Station 2 Experiment: Roll a die

Prediction for most frequent outcome (Circle one):   1   2   3   (4)   5   6

Experiment	1	6	4	3	6	2	2	4		
Place a ✔ under any outcome that matched your Prediction			✔					✔		

Station 3 Experiment: Pick a Card

Shuffle the deck of 52 cards, draw a card, record the suit, replace before repeating.

Prediction for most frequent outcome (Circle one):

♠ S (3)   ♥ H (1)   ♣ C (1)   ♦ D (circled)

Experiment	H	D	D	S	C					
Place a ✔ under any outcome that matched your Prediction		✓	✓							

Station 4 Experiment: Pick a Chip

From a bag that contains 3 Yellow chips & 2 Red chips, draw a chip, record the color, and replace it before repeating.

Prediction for most frequent outcome (Circle one):   Red   (Yellow) ← circled

Experiment										
Place a ✔ under any outcome that matched your Prediction										

Station 5 Experiment: Pick a Chip

From a bag that contains 1 Yellow chips & 4 Red chips, draw a chip, record the color, and replace it before repeating.

Prediction for most frequent outcome (Circle one):   (Red) ← circled   Yellow

Experiment										
Place a ✔ under any outcome that matched your Prediction										

Let's fill in the first 2 columns of the table below

Theoretical probability is what we expect to happen, whereas **Experimental probability** is what actually happens when we try it out. Find the Theoretical Probability and write as a fraction and percentage in the table below. Using your results from your Stations, write the Experimental Probability as a fraction and as a percentage.
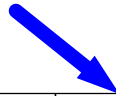
Experiment	Favorable Outcome Decided as a Class	Theoretical Probability $\frac{\text{\# of Favorable Outcomes}}{\text{Total Possible Outcomes}}$	Experimental Probability $\frac{\text{\# of Actual Favorable Outcomes}}{\text{Total Possible Outcomes}}$
Flip a Coin	H	$\frac{1}{2}$ .5	
Roll a Die	4	$\frac{1}{6}$ .1$\overline{6}$	
Draw a Card	D ♦	$\frac{13}{52}$ .25	
Draw a Chip (Station 4)	Y	$\frac{3}{5}$ .6	
Draw a Chip (Station 5)	R	$\frac{4}{5}$ .8	

Your turn!

Complete each station, then report your findings to me.

After you finish, complete the table and the questions on the last page.

Class Results...

Experiment	Favorable Outcome Decided as a Class	Theoretical Probability $\dfrac{\text{\# of Favorable Outcomes}}{\text{Total Possible Outcomes}}$	Experimental Probability $\dfrac{\text{\# of Actual Favorable Outcomes}}{\text{Total Possible Outcomes}}$
Flip a Coin	H	$\dfrac{1}{2}$ .5	$\dfrac{58}{120}$ .48
Roll a Die	4	$\dfrac{1}{6}$ .16	$\dfrac{31}{120}$ .26
Draw a Card	D ◇	$\dfrac{13}{52}$ .25	$\dfrac{30}{120}$ .25
Draw a Chip (Station 4)	Y	$\dfrac{3}{4}/\dfrac{5}{?}$ .6	$\dfrac{74}{120}$ .62
Draw a Chip (Station 5)	R	$\dfrac{4}{5}$ .8	$\dfrac{83}{120}$ .69

2. Observe the Classroom Results Provided by your teacher. Are the Experimental Probabilities the same or different from your results in your table? Why or why not?

3. What do you think will happen to our Experimental Probabilities as we perform more and more experiments?

Practice - Find the Probabilities of the following situations:

4. A standard die is thrown. What is the probability of landing an even number? _____ $\frac{3}{6}$ .5 _____

5. A standard die is thrown. What is the probability of landing a number greater than 2? _____ $\frac{4}{6}$ .6 _____

6. A card is chosen at random from a deck of 52 playing cards.

   a) What is the probability the card chosen is a Queen of Spades? _____ $\frac{1}{52}$ .02 _____

   b) What is the probability the card chosen is Red? _____ $\frac{26}{52}$ .5 _____

   c) What is the probability the card is a Face card? (Jack, Queen, King, or Ace) _____ $\frac{16}{52}$ _____

   $4 \cdot 4$ .31

7. One of these names is to be drawn from a hat.

Mary   *Jenny* *Bob*   *Marilyn*   *Bill*   *Jack*   *Jerry*   *Tina*   *Connie*   *Joe*

a) What is the Probability that you draw a 3-letter name? $\frac{2}{10}$ .2

b) What is the Probability of drawing a 4-letter name? $\frac{4}{10}$ .4

c) What is the Probability of drawing a name starting with J? $\frac{4}{10}$ .4

d) What is the Probability of drawing a name ending with Y? $\frac{3}{10}$ .3