1 Conducting Probability Experiments

You will need
- dice
- counters

Goal **Compare probabilities in two experiments.**

You are offered a choice of two games to play.

Game 1

1. Take four counters from the "bank" of counters.
2. Pay the bank back one counter to roll.
3. Roll two dice.
4. If the sum is a multiple of 3 you get two counters from the bank.

You win if you have at least three counters after four rolls.

Game 2

1. Take 10 counters from the "bank" of counters.
2. Pay the bank back two counters to roll.
3. Roll two dice.
4. If the sum is a multiple of 4 you get five counters from the bank.

You win if you have at least eight counters after four rolls.

? Which game are you more likely to win?

A. Predict which game you are more likely to win. Justify your prediction.

B. Play Game 1 three times. Use a chart to show what happened. Based on your results, what is the probability of winning?

C. Play Game 2 three times. Record the number of counters you have after each roll. Based on your results, what is your probability of winning?

D. How accurate was your prediction in Part A? Explain.

E. Play each game three more times.

F. Combine your data with someone else's. Which game are you more likely to win? Use probability language to explain why.

Game 1 Scoring

Turn	I have	I pay	I roll a sum of	I win	Now I have
1	4	1	7	0	3
2	3	1	6	2	4
3	4	1	8	0	3

Reflecting

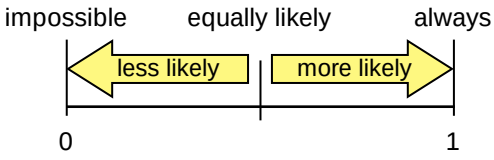
1. How many games do you think you would need to play to be fairly sure of your answer to Part F? Why?
2. In Game 1, do you think you would have ended up with more counters if you received counters for rolling a multiple of 2 rather than a multiple of 3? Explain.
3. How could you change the rules for Game 2 to make winning more likely? Explain why winning with your new rules is more likely.

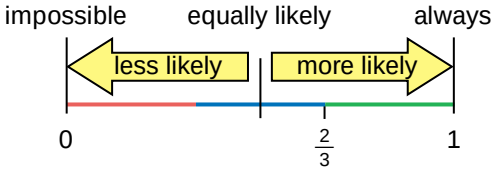
Visualizing Fractions on a Number Line

You can visualize a probability on a probability line as a position between 0 and 1.

To visualize where a probability of $\frac{2}{3}$ is on the line, mentally divide the line into three equal sections and put $\frac{2}{3}$ at the end of the second section.

A probability of $\frac{2}{3}$ means that an event is likely.





A. Why might you visualize $\frac{3}{8}$ by first visualizing $\frac{3}{4}$ and then dividing that distance in half?

B. Why might you visualize $\frac{5}{9}$ by going just a bit past $\frac{1}{2}$?

Try These

1. Place each fraction on a probability line. Tell which probability word or phrase best describes the probability.

   a) $\frac{1}{4}$ **b)** $\frac{4}{5}$ **c)** $\frac{2}{20}$ **d)** $\frac{5}{16}$

- very unlikely
- unlikely
- likely
- very likely