Task 1. Knowing Before, Knowing After

You have 2 orange and 2 blue chips in a container. Your partner, unable to see the chips, will pull two of the chips out of the container.

a) Suppose you know the first chip pulled is blue. What is the chance that the second chip pulled will be orange?

b) Suppose you know that the second chip pulled is blue. What is the chance that the first chip pulled was orange?

Habits of Interaction Private think time---- confer with an elbow partner on each question.

Then, one partner holds chips in hands, the other closes eyes, and pulls out one chip, and then a second chip. Record the result of the colors in order-- First Chip——Second Chip. Repeat at least times 15 times.

First Chip	Second Chip	First Chip	Second Chip

a2) Use your data above to compute the probability that the second chip was orange when you know that the first chip was blue.

Frequency of first chip blue was_____
Number *of those* with the second chip orange was_____
Probability that the second chip was orange, *given that* the first one was blue _____

b2) Use your data above to compute the probability that the first chip was orange when you know that the second chip was blue.

Frequency of second chip blue was_____
Number *of those* with the first chip orange was_____
Probability that the first chip was orange, *given that* the second chip was blue_____

How did your empirical results from the simulation experiment compare with your initial thinking about this problem. Any surprises?

What is the 'condition' in this problem—what did we know, when did we know it?

Task 2. Monty's Dilemma

You are playing a TV game show where you are shown 3 doors. Behind one of the doors is a valuable prize, behind the other two there is nothing. You pick one of the doors for Monty, the game show host, to open to see if you win the prize.

Instead of opening your door, Monty opens one of the other doors that has nothing behind it. Then, Monty says to you, "Do you want to Stick with your original door, or Switch to the other unopened door?"

What do you do? Stick, or Switch?

Habits of Interaction: Private think time----short confer with an elbow partner—share around at your table—large group discussion.

At your table, pairs use the spinner to gather data for each of these strategies.
At least 15 times for each strategy.

STICK—spin, you will always STICK, so record whether you won or lost

FLIP—spin, Monty shows you a door without the prize, FLIP a coin, Heads you Stick, Tails you Switch to the other door, record whether you won or lost.

SWITCH—spin, Monty shows you a door without the prize, you always SWITCH to the other door, record whether you won or lost.

Based on your data, the Probability of winning under each strategy is:

STICK_____ FLIP_____ SWITCH_____

Compare with your initial thinking about the problem. Any surprises?

What is the 'condition' in this problem—what did we know, when did we know it?

Task 3. The Blood Test

There is a blood marker that indicates a potential genetic disorder. The marker shows up in 1% of the population.

There is a blood test that is 90% accurate for the presence of the marker.

What is the probability that a person has the genetic marker given that their test was positive?

Habits of Interaction: Private think time—what do you think the probability is, why? Then confer with elbow partner, then table discussion, check in with other table partners.

What is the condition here—What do we know, and when do we know it?

Setting up a 2 x 2 contingency table to represent a simulation experiment

Consider a collection of 1000 people tested for this marker. from this city. Based on what we know, how many people would we expect to be in each of these categories?

Out of 1000 people we'd expect the that…..

Presence of Marker	Test is Positive	
	Yes	No
Yes		
No		
Total	1000	

Based on our table, given that the test was positive, what is the probability the person has the marker? Any surprises?

What is the 'condition' in this problem? What do we know, and when do we know it?