Probability Investigations Notes

- What does probability mean?
- What situations can you think of that use probability?
- Bag of 1 blue & 1 yellow
    - If I ask one of you to draw a tile without looking, what color will you draw?
    - If I asked a mathematician to answer the same question, what answer do you think I would get?
    - Write probability sentences and ask students to explain.
    - Let's try drawing a tile and replacing it. Before drawing again, what would you predict about the next color to come up? What do the mathematical probabilities tell you should happen?
    - Add a blue tile. Probabilities? Take out yellow tile. Probabilities?
- If I have a bag with 1 blue, 1 red, and 1 yellow tile, what are the probabilities of each? If I have a bag with 2 blue, 2 red, and 2 yellow tiles, what are the probabilities of each?
- If I have a bag with 3 blue tiles, 2 red tiles, and 1 yellow tile, what are the probabilities of each? What could you add to the previous bag to change the probability of yellow to be $\frac{1}{2}$?
- Our task is to determine which population of tiles is in our bag without looking inside and instead using mathematical ideas of probability and random sampling.
- Your bag contains one of the following as its contents, but you do not know which one you have.
    - A: 8 blue, 16 red
    - B: 16 blue, 8 red
    - C: 4 blue, 20 red
- In this experiment, you will take turns reaching into the bag without looking, drawing out 1 tile, noting its color in the table below, and replacing the tile in the bag. Then someone else in your group takes a turn. Continue until your table is complete.
- Do 6 pulls and record on the board. Compare the probability of blue to the different bags and make a prediction. Do 6 more pulls and record and compare again. Use a graph of probabilities after each 6 pulls if necessary to see how the numbers are changing.
- Talk about random drawing and how if you do many, many random draws from the bag, a pattern emerges. Probability is a way to predict this long-range pattern.
- Finish all 36 draws and determine which bag you have.
- Homework: There were some tiles in a bag. Students took turns drawing out a tile, noting its color, and replacing it. After 12 draws, they had drawn 6 red, 4 blue, and 2 yellow. Write what you know *for sure* about what is in the bag and what you know is *probably true*.

Probability Investigations Name _____

Contents of the Bag: 1 blue tile and 1 yellow tile

Pick	1	2	3	4	5	6	7	8	9	10	11	12
Color												

What do you predict about the next color to come up for each pick?

If I have a bag with 1 blue, 1 red, and 1 yellow tile, what are the probabilities of each?
P(*B*) = _____ P(*R*) = _____ P(*Y*) = _____

If I have a bag with 2 blue, 2 red, and 2 yellow tiles, what are the probabilities of each?
P(*B*) = _____ P(*R*) = _____ P(*Y*) = _____

If I have a bag with 3 blue tiles, 2 red tiles, and 1 yellow tile, what are the probabilities of each?
P(*B*) = _____ P(*R*) = _____ P(*Y*) = _____

What could you add to the previous bag to change the probability of yellow to be $\frac{1}{2}$?

Your bag contains one of the following as its contents, but you do not know which one you have.

A: 8 blue, 16 red
B: 16 blue, 8 red
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In this experiment, you will take turns reaching into the bag without looking, drawing out 1 tile, noting its color in the table below, and replacing the tile in the bag. Then someone else in your group takes a turn. Continue until your table is complete.

Pick	1	2	3	4	5	6	7	8	9	10	11	12
Color												

Pick	13	14	15	16	17	18	19	20	21	22	23	24
Color												

Pick	25	26	27	28	29	30	31	32	33	34	35	36
Color												

Compare your probabilities of blue and red to the bags above. Which bag do you think your group has? Explain why. DO NOT PEEK INSIDE YOUR BAG UNTIL AFTER YOU WRITE DOWN YOUR PREDICTION AND YOUR EXPLANATION.

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