

## Honors Math III Summer Project: Theoretical Probability v.s. Experimental Probability

Objective: Design an experiment to compare theoretical probability and experimental probability.

Minimum requirements: Use a spinner, coins, dice, marbles, cards, etc.

Example (You cannot use this exact example.): When you flip one fair coin, calculate the theoretical probability of getting a heads— $1/2$ . Design an experiment: I will flip a coin 10 times and record my results each time—h, h, t, h, t, t, t, h, t, t. Then, I will calculate the experimental probability of getting a heads— $4/10$  or  $2/5$ . Repeat your experiment at least 5 times and calculate an average experimental probability— $(4/10 + 5/10 + 3/10 + 7/10 + 2/10)$  divided by  $5 = 21/50$ . Analyze your result and explain why your theoretical and experimental probabilities are different. Discuss what you might do to get the two probability numbers to be exactly the same.

Your project must be presented on a presentation board.

Please remember that meeting the minimum requirements receives a minimum grade “C”. If you want an “A” or “B”, you must be creative and put in extra effort.