**Math 7** Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
**Unit 6: Probability** Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
**STUDY GUIDE**

1. What is Theoretical Probability?

What is Experimental Probability?

How are they related?

1. What is the probability of choosing a Jack from a standard deck of playing cards? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Fill in the blank: As the number of trials gets \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the experimental probability of an event gets closer to the theoretical probability of the event.
3. A bag of marbles contains 9 red, 11 orange, 4 blue, and 9 neon marbles. What is the probability of randomly selecting a marble that is **not** red?
4. If 4 out of 12 people prefer Snickers over Milky Way, how many people out of 150 people would you predict would prefer snickers?
5. Using the spinner below, what is P(spinning a number less than 7)?



1. If you flip a penny 36 times, about what percent of the tosses would you expect to land head-side up?
2. Draw a tree diagram to show the possible outcomes of spinning the spinner below and then flipping a coin.

**(hint: set up the first level with the spinner possibilities then branch off the coin possibilities)**

**S**

**T**

**A**

**Y**

1. If you spin the spinner shown, what is P(red or yellow)?

**Red**

**Yellow**

**Blue**

1. Three cards numbered 3, 6, and 7 are placed in a paper bag labeled “X”. Three cards numbered 6, 7, and 9 are placed in a paper bag labeled “Y”. A card is randomly drawn from each bag. What is the probability that both cards drawn are odd numbers?
2. Sydney’s teacher has a bag containing grape, strawberry, sour apple, blueberry, and watermelon flavored candies. Each of the 36 students in the class is asked to reach in the bag and choose a candy. The candy flavor is recorded and the candy is **replaced** in the bag before the next draw. The results are shown below.

|  |  |
| --- | --- |
| Flavor | Number of Draws |
| Grape | 7 |
| Strawberry | 11 |
| Sour Apple | 5 |
| Blueberry | 6 |
| Watermelon | 7 |

Based on these results, what is the best prediction of the number of strawberry and watermelon flavored candies in the bag if it contains 120 candies?

1. In a bag of M&M’s® the distribution of colors is shown in the table below.

|  |  |
| --- | --- |
| Color | Distribution |
| Red | 0.27 |
| Yellow | 5% |
| Green | 8% |
| Blue | 0.23 |
|  Orange |  |
| Brown |  |

If a color is selected at random, which color is most likely to be selected?

1. You have a stack of 10 red pens, 18 blue pens, and 7 black pens. If you randomly select a pen and then replace it 200 times, how many times would you expect to select a black pen?
2. Tori flips a fair coin 3 times. What is the probability that it will land heads up all three times?
3. In the United States,  of all households have fish and  of all household have a gas grill. If a household is picked at random, what is the probability that it will have fish and a grill?
4. Julia has 4 pencils that are colored red, cyan, pink and purple in her book bag. Last week, of the 20 times that she reached for a pencil, she grabbed the pink pencil 4 times. How does the experimental probability of choosing a pink pencil compare to the theoretical probability?

|  |  |
| --- | --- |
| A. | The experimental and theoretical probability is the same. |
| B. | The experimental probability is less than the theoretical probability. |
| C. | The experimental probability is greater than the theoretical probability. |
| D. | Neither the experimental nor theoretical probability can be determined. |

1. Doug has 4 different pairs of colored pants, 3 different colored shirts, and 2 jackets. How many unique combinations can he make with these?
2. A bag of skittles contains green, orange, red, and yellow candies.  of the bag contains green and orange candies and  of the bag is red candies. What is the probability of picking out a yellow skittle from this bag?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. |   | B. |   | C. |   | D. |   |

1. A box of cereal contains one cartoon character toy and there are four different toys to collect. If you want to collect all the toys, which of the following simulations could help you estimate the number of boxes of cereal you would need to purchase in order to collect all four toys?

|  |  |
| --- | --- |
| A. | Create a tree diagram to show all of the different combinations. |
| B. | Label cards as A, B, C, D, E, and F. Draw a card, record the result, do not replace the card, and then draw another card. Repeat this process until all six cards have been drawn. |
| C. | Create a spinner with 4 sections and spin until you have landed on each section 1 time. |
| D. | Roll a six-sided number cube until each number is rolled once. |

1. You roll a pair of fair six-sided dice. Are “rolling a sum of 8” and “rolling doubles” equally likely events? Justify your answer.

|  |  |  |
| --- | --- | --- |
|  |  | Cube 2 |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 |
| Cube 1 | 1 | (1, 1) | (1, 2) | (1, 3) | (1, 4) | (1, 5) | (1, 6) |
| 2 | (2, 1) | (2, 2) | (2, 3) | (2, 4) | (2, 5) | (2, 6) |
| 3 | (3, 1) | (3, 2) | (3, 3) | (3, 4) | (3, 5) | (3, 6) |
| 4 | (4, 1) | (4, 2) | (4, 3) | (4, 4) | (4, 5) | (4, 6) |
| 5 | (5, 1) | (5, 2) | (5, 3) | (5, 4) | (5, 5) | (5, 6) |
| 6 | (6, 1) | (6, 2) | (6, 3) | (6, 4) | (6, 5) | (6, 6) |