Name: _____ Class: _____ Date: _____

Simple Probability

Please answer all questions on a separate piece of paper.

Experimental probability: The probability based on data collected in experiments.

$$\text{Experimental probability} = \frac{\text{number of successful outcomes in the experiment}}{\text{total number of outcomes in the experiment}}$$

Theoretical probability is a calculated probability based on the possible outcomes when they all have the same chance of occurring.

$$\text{Theoretical probability} = \frac{\text{number of successful outcomes (events)}}{\text{total number of possible outcomes}}$$

1. There are 24 crayons in a box: 5 black, 3 white, 7 red, 2 yellow, 3 blue, and 4 green. What is the probability of randomly choosing a green? Did you respond with an experimental or theoretical probability?

2. A spinner is divided into four equal sections numbered 2, 4, 6, and 8. What is the probability of spinning an 8?

3. A fair number cube marked 1, 2, 3, 4, 5, and 6 is rolled. Tyler tossed the cube 40 times, and noted that 26 times an even number showed. What is the experimental probability that an even number will be rolled? What is the theoretical probability?

4. Sara is at a picnic and reaches into an ice chest, without looking, to grab a can of soda. If there are 14 cans of orange, 12 cans of fruit punch, and 10 cans of cola, what is the probability that she takes a can of fruit punch? Did you respond with an experimental probability or a theoretical one?

5. A baseball batting average is the probability a baseball player hits the ball when batting. If a baseball player has a batting average of 266, it means the player's probability of getting of getting a hit is 0.266. Is a batting average an experimental probability or theoretical?

6. In 2011, 39 people died by being struck by lightning, and 241 people were injured. There were 310,000,000 people in the United States. What is the probability of being one of the people struck by lightning?

7. In a medical study, 107 people were given a new vitamin pill. If a participant got sick, they were removed from the study. Ten of the participants caught a common cold, 2 came down with the flu, 18 got sick to their stomach, and 77 never got sick. What was the probability of getting sick if you participated in this study? Did you respond with an experimental probability or a theoretical one?

8. Insurance companies use probabilities to determine the rate they will charge for an insurance policy. In a study of 300 people that had life insurance policies, an insurance company found that 111 people were over 80 years old when they died, 82 people died when they were between 70 and 80 years old, 52 died between 60 and 70 years old, and 55 died when they were younger than 60 years old. In this study what was the probability of dying younger than 70 years old? Did you respond with an experimental probability or a theoretical one?