Name: _____

Theoretical and Experimental Probability

Follow along with the video and take notes.

Objectives:

- To distinguish between theoretical and _____ probability.
- To calculate _____ _____.
- To use probability to _____ _____.

Probability is _____.

Probability can be written as a _ratio_, _____,_____, or _____.

Theoretical Probability is what should happen: $\frac{\textit{Number of } _____}{\textit{Number of } _____}$.

Experimental Probability is what actually happens: $\frac{\textit{Number of } _____}{\textit{Number of } _____}$.

What would be the probability of drawing one red marble from the bag?

$$\frac{\text{Number of red marbles}}{\text{Total number of marbles}} = _____ = \quad = \quad \%$$

We performed this experiment 100 times and the results are shown in the table.

Marble	Frequency
Yellow	9
Red	34
Blue	21
Green	36

What would the relative frequency of getting a red marble? (Write your answer as a fraction, decimal, and percent.)

Relative Frequency (Red) = _____ = = %

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Here we have the results of a survey for uniform-wear given to a random sample of 200 high school students at Johnson High School.

If we wanted to predict how many of the school's 1900 students are wearing the white polo, we can use the data collected.

Johnson High School Uniform-Wear Survey	
Uniform Wear	**Number of Students**
Purple Spirit Shirt	64
Purple Polo	41
White Polo	39
Navy Polo	56

$\frac{\text{Number of students wearing White Polo}}{\text{Total students surveyed}}$ = _____ = = %

_____% of 1900 = _____



Practice

Now you try it!

1. Kerry tosses a number cube containing the numbers 1-6. Find the theoretical probability of each event below. Write your answer as a fraction in simplest form, a decimal, and a percent.

a. P(even)

b. P(4)

c P(prime number)

d. P(multiple of 3)

e. P(a number less than 3)

f. P(7)

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2. Eduardo rolls a number cube 40 times. The results are displayed below in a frequency table. Use the table to answer the questions below. Write your answer as a fraction in simplest form.

Number Rolled	Frequency
1	6
2	8
3	4
4	8
5	10
6	4

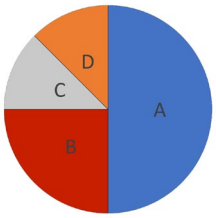
a. What is the relative frequency of rolling a 5?

b. What is the relative frequency of rolling an odd number?

c. What is the experimental probability of rolling a 4 or greater than 4?

d. What is the experimental probability of rolling the lowest prime number?

3. The spinner below has 4 parts, each containing a letter. Letter A is $\frac{1}{2}$ of the circle, B is $\frac{1}{4}$ of the circle, and C and D are each $\frac{1}{8}$ of the circle. Ben spun the spinner 50 times and landed on the letter C 8 times. If Ben spins the spinner 80 times, how many times can Ben expect the spinner to land on the letter B?



4. Last week Leah's Bakery had 2,000 customers and sold 250 blueberry muffins. With the grand opening of a retail store nearby, Leah is expecting 3,000 customers next week. About how many blueberry muffins can she expect to sell?

5. On average a local grocery store hires 15% of its applicants for the holiday season. If 45 people applied for the holiday season, predict how many people would be hired?

Ascend Math
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