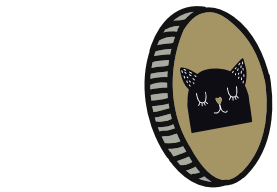
Name _____ Date _____ Answer Key

Make Predictions Using Theoretical Probability



Theoretical probability is the probability that is mathematically expected. You can find theoretical probability using the following fraction:

$$\text{Theoretical probability} = \frac{\text{number of favorable outcomes}}{\text{total number of possible outcomes}}$$

So, if you flip a coin, the theoretical probability of the coin landing on heads is $\frac{1}{2}$.

You can use theoretical probability to make predictions! If you flip a coin 600 times, what is the best prediction for the number of times the coin will land on heads?

$\frac{1}{2} = \frac{n}{600}$ *Write a proportion that sets the two ratios equal to each other.*

$\frac{1}{2} \cdot 600 = \frac{n}{600} \cdot 600$ *Multiply both sides by 600.*

$300 = n$ *Simplify. So, you can predict the coin will land on heads 300 times.*

Use theoretical probability to make each prediction.

1. If you roll a six-sided die 24 times, what is the best prediction for the number of times you will roll the number 3?

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2. If you spin this spinner 45 times, what is the best prediction for the number of times it will land on section A?

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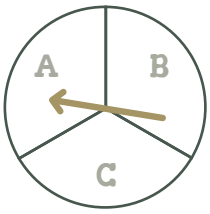

3. There are 3 blue marbles and 5 red marbles in a bag. You randomly select a marble and put it back in the bag. If you do this 40 times, what is the best prediction for the number of times you will select a red marble?

25

4. If you spin this spinner 20 times, what is the best prediction for the number of times it will land on an even number?

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