Probability is the measure of how likely it is that an event will occur. You can write the probability of an event as a fraction or decimal from 0 to 1, or as a percent from 0 to 100%, inclusive.

The probability of tossing a penny and it landing on heads is $\frac{1}{2}$.

To write the probability as a decimal, divide the numerator by the denominator.

$1 \div 2 = 0.5$ The probability of landing on heads is 0.5.

To write the probability as a percent, first write the fraction as a decimal. Then move the decimal point two places to the right.

$1 \div 2 = 0.5 = 50\%$ The probability of landing on heads is 50%.

Write the probability.

1. The probability of Joy winning the race is 0.4. Write this probability as a fraction and a percent.

The higher the probability, the more likely the event is to occur.

Events with a probability of 0 or 0% never happen.

Events with a probability of 1 or 100% always happen.

Events with a probability of $\frac{1}{2}$, 0.5, or 50%, have the same chance of happening as of not happening.

If you have a bag of red marbles and blue marbles, the probability of pulling out a green marble is 0. The event is impossible because there are no green marbles in the bag.

Write impossible, unlikely, as likely as not, likely, or certain to describe each event.

2. A week has seven days.

3. Rolling a 7 on a standard number cube.
You can use what you know about fractions, decimals and percents to compare probabilities.

When you roll two standard number cubes, the chance that you roll a sum of 2 is \(\frac{1}{36}\). The chance that you roll a sum of 7 is \(\frac{1}{6}\).

To figure out which event is more likely to occur, compare the probabilities of the events.

First make sure the fractions have the same denominators.

\[
\frac{1}{36} = \frac{1}{36} \\
\frac{1}{6} = \frac{6}{36} \\
\frac{6}{36} > \frac{1}{36}
\]

Find an equivalent fraction.

So rolling a sum of 7 is more likely to occur than rolling a sum of 2.

Compare the probabilities to decide which event is more likely to occur.

4. The probability that a month of the year ends with R is \(\frac{1}{3}\). The probability that a month of the year ends with E is \(\frac{1}{12}\). Is it more likely that a month of the year will end with R or E?

5. When you spin a spinner, there is a 20% chance of it landing on 1, a 30% chance of it landing on 2, and a 50% chance of it landing on 3. Is it more likely that the spinner will land on 1 or 2?

6. When you pick a marble from a bag, the chance that the marble is blue is 0.3, the chance that it is purple is 0.4, and the chance that it is red is 0.3. Is it more likely that the marble you pick will be red or blue?