

Lesson 2.2 Calculating Probability

A **compound event** consists of two or more events. Tossing two coins is a compound event. Tossing a coin and rolling a die is also a compound event.

Compound events are **independent** if the outcome of one event does not influence the outcome of the others. When you flip a coin, there is a $\frac{1}{2}$ probability of heads and a $\frac{1}{2}$ probability of tails. Suppose your coin flip produces tails. If you flip the coin again, there is still a $\frac{1}{2}$ probability of heads and a $\frac{1}{2}$ probability of tails. These events are independent.

If events A and B are independent, then the probability of both occurring is:

$$P(A) \times P(B)$$

The probability of getting tails in one coin flip is $\frac{1}{2}$. The probability of getting a 5 in one roll of a die is $\frac{1}{6}$. The probability of both occurring, {tails, 5}, is $\frac{1}{2} \times \frac{1}{6} = \frac{1}{12}$.

Determine each probability. Express your answer as a fraction in simplest form.

1. Events E and F are independent. The probability that E will occur is $\frac{2}{5}$. The probability that F will occur is $\frac{3}{7}$. What is the probability that both E and F will occur?

The probability that both E and F will occur is $\frac{6}{35}$.

2. A nationwide poll found that 3 of 5 voters planned to vote for Candidate X. Jay and Aisha voted. What is the probability that both voted for Candidate X?

The probability that both voted for Candidate X is $\frac{9}{25}$.

3. You roll a 6-sided die and flip a coin. What is the probability of getting an even number on the die and heads on the coin?

P(even) and P(heads) is $\frac{1}{4}$.

4. A jar of jellybeans has 6 blue, 2 orange, and 8 red jellybeans. You choose 1 jellybean, put it back, and then choose another. What is the probability that you choose 2 blue jellybeans?

The probability of choosing 2 blue jellybeans is $\frac{9}{64}$.