Let S be a uniform sample space and let E be any event. Then, $P(E) = \dfrac{n(E)}{n(S)}$.

Example 1: Consider the experiment of tossing a fair coin 10 times.
a. Find the probability that the coin lands heads exactly 7 times.

b. Find the probability that the coin lands heads at most 2 times.

c. Find the probability that the coin lands tails at least 9 times.

d. Find the probability that the coin lands tails at least once.

Example 2: In a survey of 35 consumers at a local supermarket, 7 indicated that they buy brand A of a certain product and the rest indicated that they buy brand B of the same product. You choose 5 customers surveyed at random.
a. What is the probability that 4 buy brand B and 1 buys brand A?

b. What is the probability that 3 buy brand A?

Example 3: A department store is shipped 100 remote controlled cars of which 6 are defective. A customer selects 7 cars at random.
a. What is the probability that at least 5 will be defective?

b. What is the probability that at most 4 will be defective?

Example 4: Eight cards are selected at random from a well-shuffled deck of 52 playing cards.

a. What is the probability that either 4 face cards or 5 face cards are chosen?

c. What is the probability that 5 cards are red?