Royal Flush- 1 in 649,740

Straight Flush-1 in 72,193

Four of a Kind-1 in 4165

Full House-1 in 694

Flush-1 in 508.8

Straight-1 in 254.8

Three of a kind-1 in 47.3

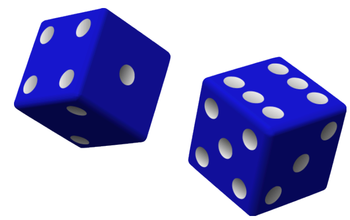
Two Pair-1 in 21

Pair- 1 in 2.37

High Card-1 in 2

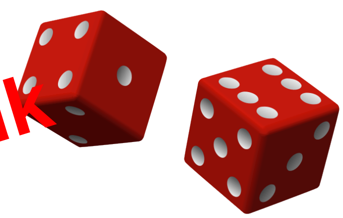
$$EV = \left(\frac{1}{6}\right)(10) + \left(\frac{5}{6}\right)(-3) = \frac{10}{6} + \left(-\frac{15}{6}\right) = -\frac{5}{6}.$$

If the expected value is positive you should play because even though you can lose sometimes, you will make money in the long run. If the expected value is negative you should not play because you can still win money but you will lose money in the long run. So in this case, you should not play.



Here is another situation. In a jar, there are 11 blue dice and 16 red dice.
If you pick out a blue die, you lose $15
If you pick out a red die, you win $11
Should you play?

$$EV = (\%\ of\ Winning)(Payout) + (\%\ of\ losing)(cost)$$



Let's substitute;

$$EV = \left(\frac{16}{27}\right)(11)+\left(\frac{11}{27}\right)(-15)=\frac{176}{27}+\frac{-165}{27}=\frac{11}{27}$$

You should play this game because the expected value is positive.

Basic Permutation and Combination Skills