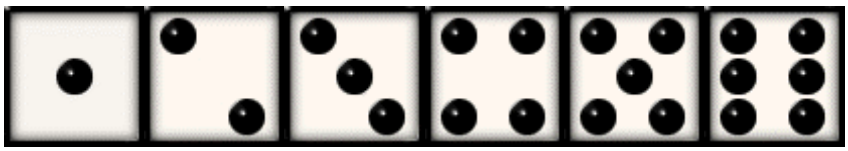
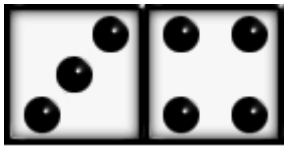
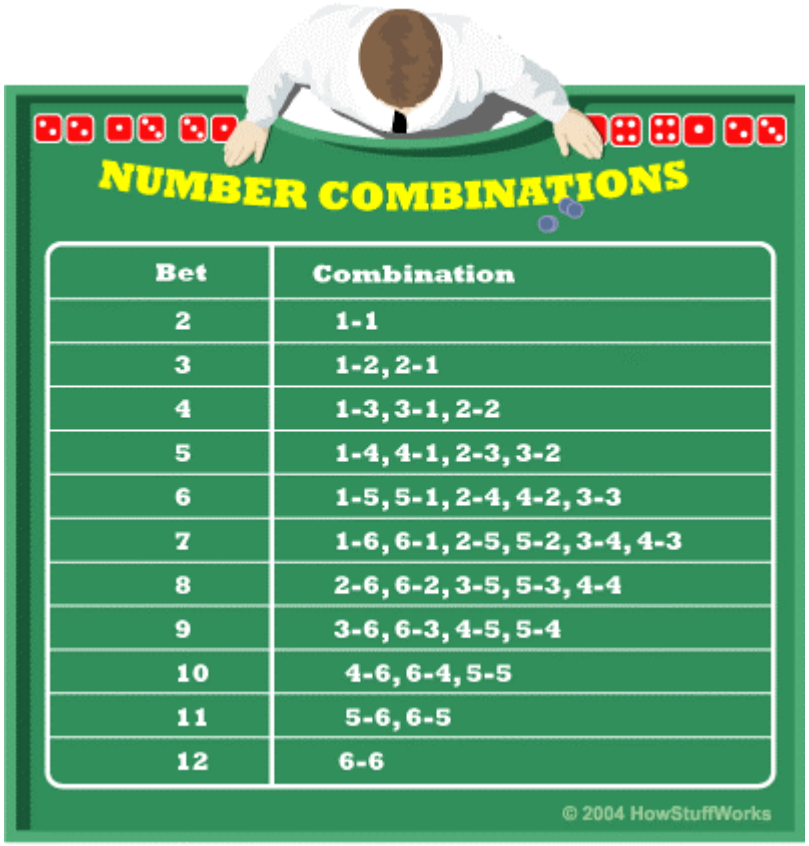
The six faces of a single die



The game of craps involves rolling 2 die, we see combinations such as:

 There are 36 possible combinations which generate 11 sums of the two die, they range from 2-12. Below is a chart



We can see that there is

1 way to roll a sum of 2,
2 ways to roll a sum of 3,
3 ways to roll a sum of 4,
4 ways to roll a sum of 5,
5 ways to roll a sum of 6,
6 ways to roll a sum of 7,
5 ways to roll a sum of 8,
4 ways to roll a sum of 9,
3 ways to roll a sum of 10,
2 ways to roll a sum of 11,
1 way to roll a sum of 12

Theory tells us that we can expect to see a “7” rolled 6/36 or about 16.7% (or .16667) of the time…on average.

But remember, anything can happen in the short run.

Example : **Applying the addition and multiplication rules**

Suppose you get a job as a "assisted sales-person" in a large electronics store (like Best Buy) and prospective buyers behave this way: 60% of the time they don't want anything to do with you and 40% of the time they will talk to you. Three people are walking towards you, assume they don't know each other and have INDEPENDENTLY chosen to walk towards you. What are the probabilities of 0, 1, 2, or all 3 talking to you?

Outcome	All 3 talk	2 talk to you	1 talks to you	0 talk to you
Probability	.4*.4*.4 or ($.4^3$)	(.4*.4*.6)+ (.4*.6*.4)+ (.6*.4*.4)	(.6*.4*.6)+ (.6*.6*.4)+ (.4*.6*.6)	.6*.6*.6 (or $.6^3$)
	.064	.096+.096+.096	.144+.144+.144	.216

Suppose that if you can get <u>at least two</u> people talking to you, you are guaranteed a sale. What is your chance of a sale given these probabilities?

Tree Diagrams might help