Theoretical v. Experimental Probability

What is the probability of landing on tails when you flip a coin?

$\frac{1}{2}$ 50%

What is the probability of rolling a number 4 on a six sided die?

$\frac{1}{6}$ 16.6%

What is the probability of picking a diamond out of a deck of cards?

$\frac{13}{52} = \frac{1}{4}$ 25%

Probability

Probability: 0 or 0% = never. 1 or 100% = certain.

Theoretical probability – the *calculated* likelihood of an *outcome* based on counting the *total number of possible outcomes.*

Experimental probability – the likelihood that an *outcome* will happen based on *real data* (experiments)

Sums of 2 dice

36 possible outcomes.

2	3	4	5	6	7	8	9	10	11	12
1	1,2 2,1	2,2 3,1 1,3	1,4 4,1 2,3 3,2	3,3 4,2 2,4 5,1 1,5	5,2 2,5 4,3 3,4 1,6 6,1	2,6 6,2 3,5 5,3 4,4	6,3 3,6 4,5 5,4	5,5 6,4 4,6	6,5 5,6	6,6
(1)	(2)	(3)	(4)	(5)	(6)	(5)	(4)	(3)	(2)	(1)

sible rolls: 36	P(sum of 2): $\frac{1}{36}$ = 2.7%	P(sum of 3): $\frac{2}{36}$ 5.6
4): $\frac{3}{36}$ 8.3%	P(sum of 5): $\frac{4}{36}$ 11.1%	P(sum of 6): $\frac{5}{36}$ 13.9
7) $\frac{6}{36}$ 16.7%	P(sum of 8): $\frac{5}{36}$ 13.9%	P(sum of 9): $\frac{4}{36}$ 11.1
10): $\frac{3}{36}$ 8.3%	P(sum of 11): $\frac{2}{36}$ 5.6%	P(sum of 12): $\frac{1}{36}$ 2.7