We can define a binomial distribution with three parameters:

P is the probability of a 'successful' event. That is the event type that you're counting up - like 'heads' or 'correct answers' or 'did eat vegetables'. For a coin flip, P = 0.5. For guessing on a 4-option multiple choice test, P = 1/4 = .25. For my ten year old eating his vegetables, P = 0.05.

N is the number of repeated events.

k is the number of 'successful' events out of N.

The probability of obtaining k successful events out of N, with probability P is:

$$\frac{N!}{k!(N-k)!}P^k(1-P)^{N-k}$$

where N! = $N(N-1)(N-2)...$, or N 'factorial'.

5) For P = 0.35 and N = 5, find $Pr(k <= 1)$

.1160 + .3124 = .4284

Binomial distribution table: $1 \leq N \leq 8$

		P: probability of k positive outcomes out of N events									
N	k	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5
1	0	0.9500	0.9000	0.8500	0.8000	0.7500	0.7000	0.6500	0.6000	0.5500	0.5000
	1	0.0500	0.1000	0.1500	0.2000	0.2500	0.3000	0.3500	0.4000	0.4500	0.5000
2	0	0.9025	0.8100	0.7225	0.6400	0.5625	0.4900	0.4225	0.3600	0.3025	0.2500
	1	0.0950	0.1800	0.2550	0.3200	0.3750	0.4200	0.4550	0.4800	0.4950	0.5000
	2	0.0025	0.0100	0.0225	0.0400	0.0625	0.0900	0.1225	0.1600	0.2025	0.2500
3	0	0.8574	0.7290	0.6141	0.5120	0.4219	0.3430	0.2746	0.2160	0.1664	0.1250
	1	0.1354	0.2430	0.3251	0.3840	0.4219	0.4410	0.4436	0.4320	0.4084	0.3750
	2	0.0071	0.0270	0.0574	0.0960	0.1406	0.1890	0.2389	0.2880	0.3341	0.3750
	3	0.0001	0.0010	0.0034	0.0080	0.0156	0.0270	0.0429	0.0640	0.0911	0.1250
4	0	0.8145	0.6561	0.5220	0.4096	0.3164	0.2401	0.1785	0.1296	0.0915	0.0625
	1	0.1715	0.2916	0.3685	0.4096	0.4219	0.4116	0.3845	0.3456	0.2995	0.2500
	2	0.0135	0.0486	0.0975	0.1536	0.2109	0.2646	0.3105	0.3456	0.3675	0.3750
	3	0.0005	0.0036	0.0115	0.0256	0.0469	0.0756	0.1115	0.1536	0.2005	0.2500
	4	0.0000	0.0001	0.0005	0.0016	0.0039	0.0081	0.0150	0.0256	0.0410	0.0625
5	0	0.7738	0.5905	0.4437	0.3277	0.2373	0.1681	0.1160	0.0778	0.0503	0.0313
	1	0.2036	0.3281	0.3915	0.4096	0.3955	0.3601	0.3124	0.2592	0.2059	0.1563
	2	0.0214	0.0729	0.1382	0.2048	0.2637	0.3087	0.3364	0.3456	0.3369	0.3125
	3	0.0011	0.0081	0.0244	0.0512	0.0879	0.1323	0.1811	0.2304	0.2757	0.3125
	4	0.0000	0.0005	0.0022	0.0064	0.0146	0.0283	0.0488	0.0768	0.1128	0.1563
	5	0.0000	0.0000	0.0001	0.0003	0.0010	0.0024	0.0053	0.0102	0.0185	0.0313

4) For P = 0.5 and N = 7, find $Pr(k >= 4)$

$Pr = .5$

19) For P = 0.85 and N = 7, find $Pr(k >= 3)$

This is the same as:

$p = 1 - .85 = .15$

$k = 7 - 3 = 4$ $\quad N-k$

$Pr(k \leq 4)$

$= .3206 + .3960 + .2097$

$+ .0617 + .0109 = \underline{.9989}$

30) For P = 0.5 and N = 19, find $Pr(k >= 3)$

30) For P = 0.5 and N = 19, find $Pr(k >= 3)$
Since $N <= 20$ use the binomial table.
$Pr(k >= 3) = 0.0018 + 0.0074 + ... + 0 = 0.9997$

Using R:
```
out<-binom.test(3,19,0.5,alternative = "greater")
print(out$p.value)
[1] 0.9996357
```