

Name	Meaning	Parameters	$P[X = i]$	$E[X]$	$Var[X]$
Binomial	#successes over n equal trials	n (num. trials), p (prob. of success)	$\binom{n}{i} \cdot p^i \cdot (1-p)^{n-i}$	$n \cdot p$	$n \cdot p \cdot (1-p)$
Poisson	#successes in a large #trials, each with small probability	λ (rate)	$\frac{\lambda^i}{i!} \cdot e^{-\lambda}$	λ	λ
Geometric	#trials to get first success	p (prob. of success)	$p \cdot (1-p)^{i-1}$	$\frac{1}{p}$	$\frac{1-p}{p^2}$
Negative Binomial	#trials to get r successes	p (prob. of success), r (target)	$\binom{i-1}{r-1} \cdot p^r \cdot (1-p)^{i-r}$	$\frac{r}{p}$	$\frac{r \cdot (1-p)}{p^2}$
Hypergeometric	#blue when sampling n elements from a population of N blue and M not blue	N, M, n	$\frac{\binom{N}{i} \cdot \binom{M}{n-i}}{\binom{N+M}{n}}$	$n \cdot \frac{N}{N+M}$	$\frac{nNM}{N+M} \cdot \left(1 - \frac{n-1}{N+M-1}\right)$