

[◀ Back to Week 4](#)[✕ Lessons](#)[Prev](#)[Next](#)

Suggested reading: [OpenIntro Statistics, 3rd edition](#), Chapter 3, Sections 3.4

LO 1. Determine if a random variable is binomial using the four conditions.

- The trials are independent.
- The number of trials, n , is fixed.
- Each trial outcome can be classified as a success or failure.
- The probability of a success, p , is the same for each trial.

LO 2. Calculate the number of possible scenarios for obtaining k successes in n trials using the choose function: $\binom{n}{k} = \frac{n!}{k!(n-k)!}$.

LO 3. Calculate probability of a given number of successes in a given number of trials using the binomial distribution: $P(k = K) = \binom{n}{k} p^k (1-p)^{(n-k)}$.

LO 4. Calculate the expected number of successes in a given number of binomial trials ($\mu = np$) and its standard deviation ($\sigma = \sqrt{np(1-p)}$).

LO 5. When number of trials is sufficiently large ($np \geq 10$ and $n(1-p) \geq 10$), use the normal approximation to calculate binomial probabilities, and explain why this approach works.

Test yourself:

1. True/False: We can use the binomial distribution to determine the probability that in 10 rolls of a die the first 6 occurs on the 8th roll.
2. True / False: If a family has 3 kids, there are 8 possible combinations of gender order.
3. True/ False: When $n = 100$ and $p = 0.92$ we can use the normal approximation to the binomial to calculate the probability of 90 or more successes.

✓ Complete

