

- LO 1.** Calculate the standardized (Z) score of a data point given the mean and standard deviation of its distribution.
- LO 2.** Use the Z score to determine the percentile score of a data point if the distribution is normal (using technology or normal probability tables), or to assess whether or not the particular observation would be considered unusual (regardless of the shape of the distribution).
- LO 3.** Depending on the shape of the distribution determine whether the median would have a negative, positive, or 0 Z score.
- LO 4.** Assess whether or not a distribution is nearly normal using the 68-95-99.7% rule or graphical methods such as a normal probability plot.

\* *Reading: Section 3.1 and 3.2 of OpenIntro Statistics*

\* *Video: Normal Distribution - Finding Probabilities - Dr.Çetinkaya-Rundel, YouTube, 6:04*

\* *Video: Normal Distribution - Finding Cutoff Points - Dr.Çetinkaya-Rundel, YouTube, 4:25*

\* *Additional resources:*

– *Video: Normal distribution and 68-95-99.7% rule, YouTube, 3:18*

– *Video: Z scores - Part 1, YouTube, 3:03*

– *Video: Z scores - Part 2, YouTube, 4:01*

\* *Test yourself: True/False: In a right skewed distribution the Z score of the median is positive.*

- LO 5.** Determine if a random variable is binomial using the four conditions.
- LO 6.** Calculate the number of possible scenarios for obtaining  $k$  successes in  $n$  trials.
- LO 7.** Calculate probability of a given number of successes in a given number of trials using the binomial distribution.
- LO 8.** When number of trials is sufficiently large, use normal approximation to calculate binomial probabilities, and explain why this approach works.

\* *Reading: Section 3.4 of OpenIntro Statistics*

\* *Video: Binomial Distribution - Finding Probabilities - Dr.Çetinkaya-Rundel, YouTube, 8:46*

\* *Additional resources:*

– *Video: Binomial distribution, YouTube, 4:25*

– *Video: Mean and standard deviation of a binomial distribution, YouTube, 1:39*

\* *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.*