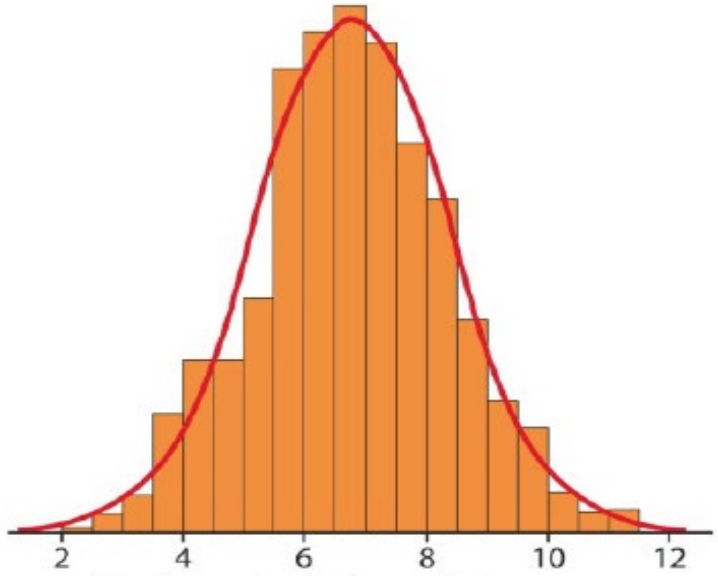
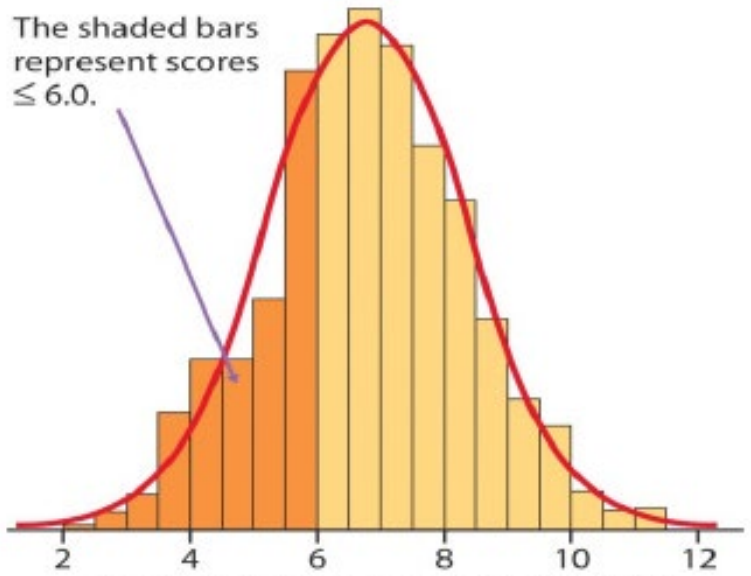
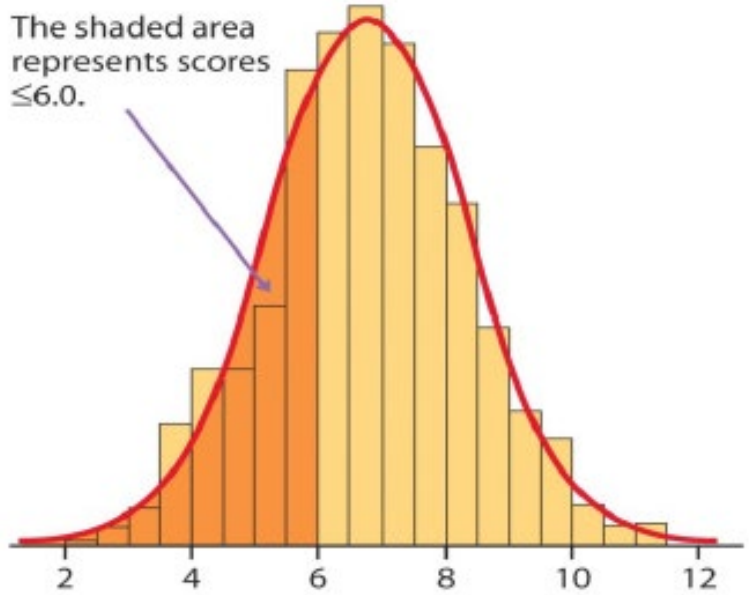
Normal models

A statistical **model** is a theoretical formula or graph that accurately describes and predicts a lot of real-world data.
The **normal** model predicts many symmetric unimodal variables.







Key fact: The area of a part of a histogram
is the percentage of cases in that part.

Three powerful techniques using normal models

A value's **z-score** tells you how many standard deviations it is from the mean. Converting to a z-score standardizes the value into SDs instead of whatever units it had before, which are the same for any normal distribution.

$$z = \frac{y - \bar{y}}{s} = \frac{y - \mu}{\sigma}$$

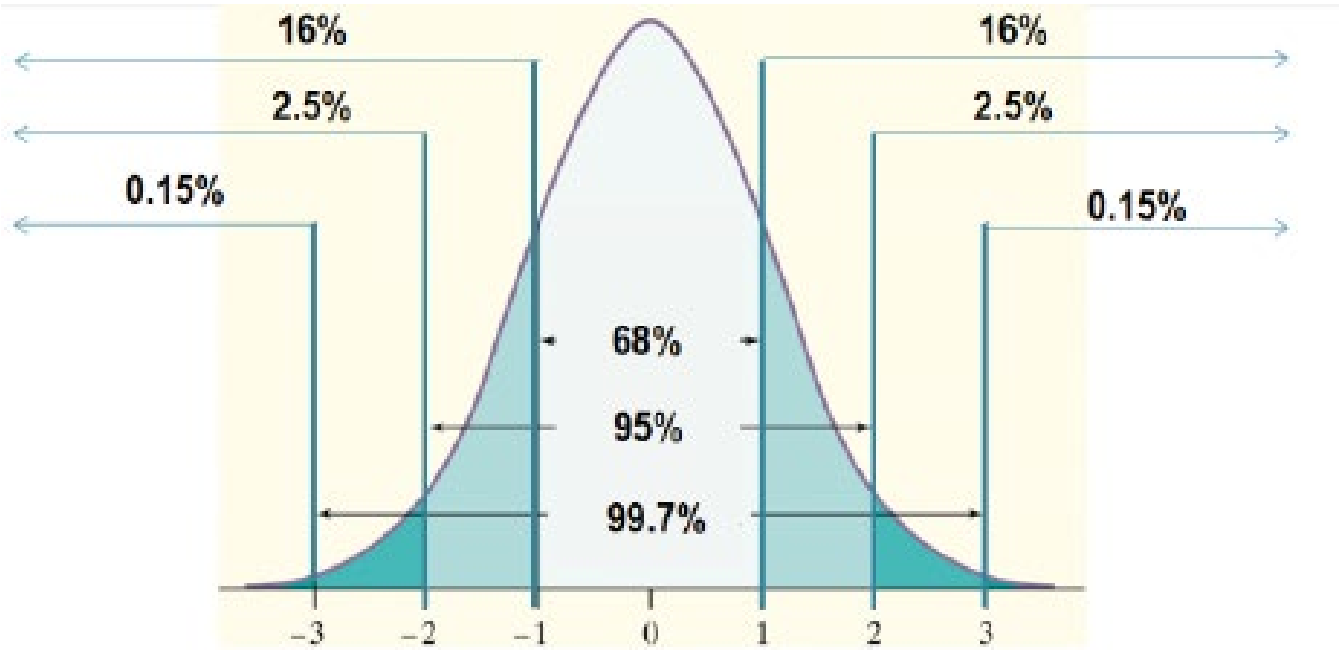
1. Estimating percentiles using z-scores

Convert a value into a z-score, then into a proportion of area using R, a z table, an app, or a calculator.

Example: According to an article in the Journal of the American Medical Association, U.S. residents have a mean temperature of 98.2^{o}F with a standard deviation of 0.7 ^{o}F.

2. Estimating percentiles using the 68-95-99.7 rule

Remember these common proportions of area.



3. Compare between different normal distributions

Convert values from each curve into z-scores, then they're comparable in standardized form.