

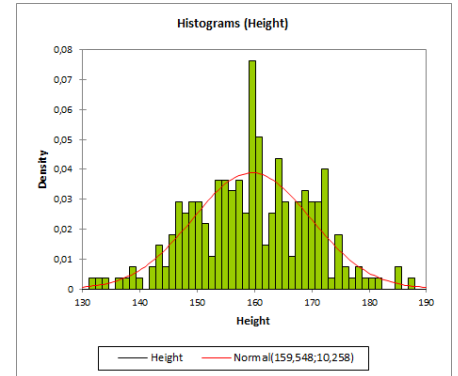
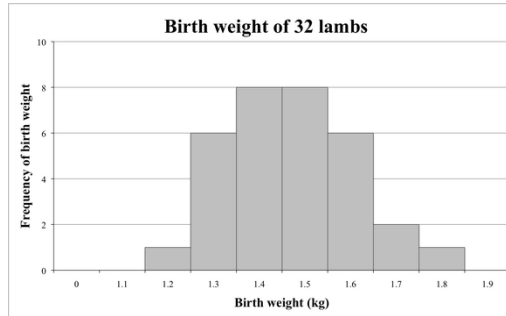
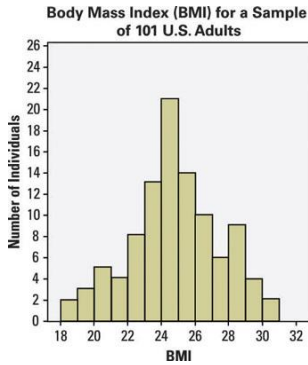
The Normal Distribution

Class Prep Assignment

Due at the beginning of next class

The Normal Distribution – The bell-shaped curve

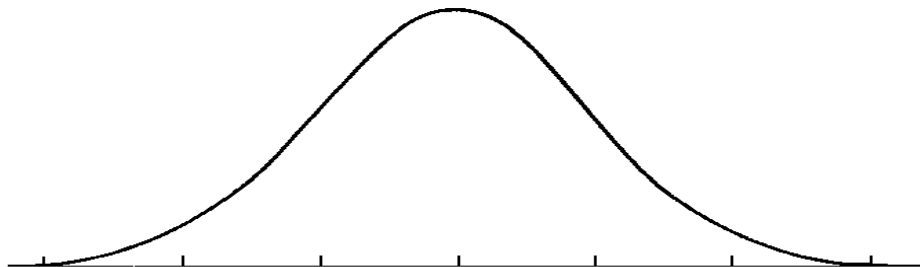
Used when the data is unimodal and approximately symmetric (mean = median)



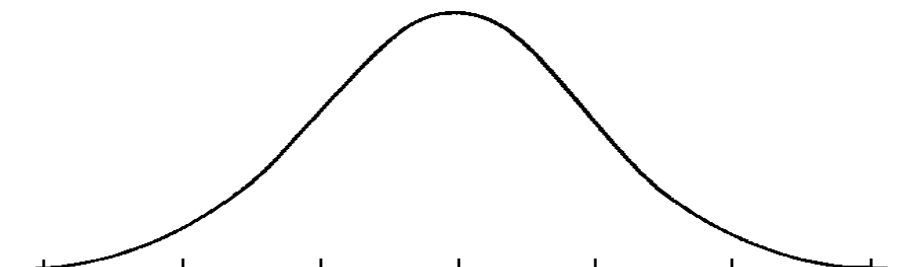
Sources: <http://www.dummies.com/education/math/statistics/interpreting-histograms/>
<https://learnandteachstatistics.wordpress.com/2012/11/12/beware-of-excel-histograms/>
<https://www.xlstat.com/en/solutions/features/histograms>

How to label a Normal Distribution - The standard deviation is the scale

Example. Heights of 10-year-olds of all genders closely follow a normal distribution with a mean of 55 inches and a standard deviation of 6 inches. Label the normal curve.



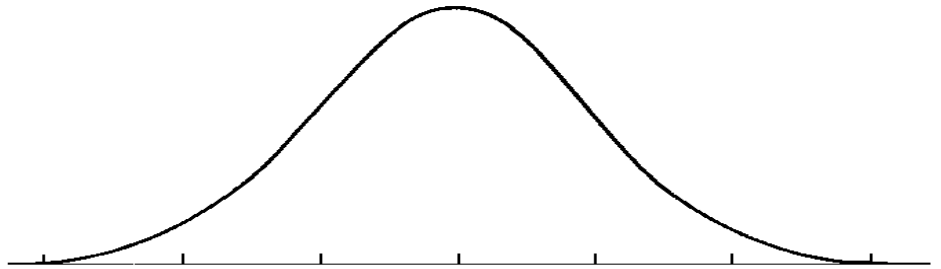
The 68-95-99.7 Rule for a Normal Distribution (Empirical Rule)



Calculating Probabilities with the Empirical Rule

Example Continued. Find the probability that a randomly selected 10-year-old is:

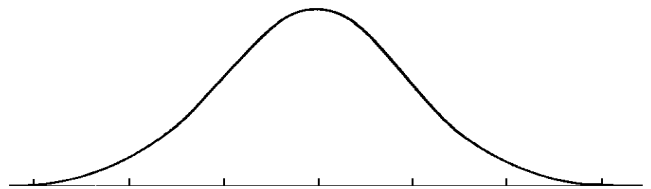
- a. between 49 and 61 inches
- b. between 55 and 61 inches
- c. greater than 61 inches
- d. 37 inches or less



Z-Scores (Standard Scores)

The number of standard deviations that a value is away from the mean.

$$Z = \frac{x - \text{mean}}{s}$$

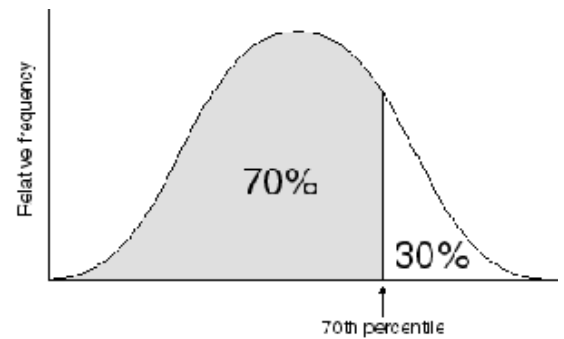


- e. Find the Z-score for a 10-year-old height of 52 inches and give its interpretation.

Percentile

The xth percentile is the value that x% of the data values are below.

- f. A 10-year-old is in the 86th percentile in height. This means the child is taller than _____ % of 10-year-olds.



Use the Empirical Rule to Find Percentiles

Find the corresponding percentiles for the Z-scores.

Z-score	Percentile
-3	
-2	
-1	
0	
1	
2	
3	

