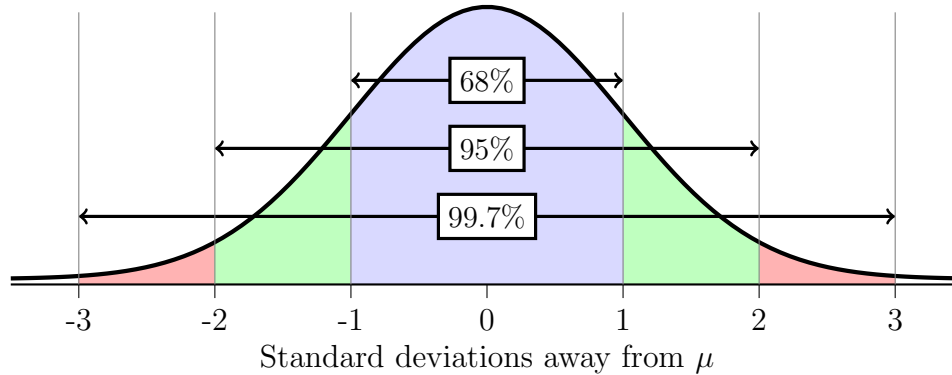**Normal Distributions**   **Workshop**

The **empirical rule** (also known as the **68-95-99.7 rule**) is a quick way to convert z-values to proportions of a normal distribution.

1. Annual rainfall in Farmville, VA is approximately normally distributed with a mean of 44 inches and a standard deviation of 7 inches.

   (a) In what percent of years will Farmville get more than 51 inches of rain?

   (b) In what percent of years will Farmville get less than 30 inches of rain?

2. For each of the following datasets, sketch a plausible looking histogram, then decide if the data might be approximately normal.

   (a) The number of math classes each HSC student takes before graduation.

   (b) The number of siblings each student at HSC has.

   (c) Actual weights of 12 ounce bags of potato chips.

3. Annual rainfall in Farmville, VA is approximately normally distribution with mean 44 inches and standard deviation 7 inches. Annual rainfall in Los Angeles, CA is also approximately normally distributed, but with a mean of 15 inches and standard deviation 7.1 inches. In which location would it be more unusual to get a year with 34 inches of rain? Use z-values to explain your answer.

4. On the verbal portion of the SAT, the mean is about 500, and the standard deviation is 100. Estimate the percentile of a student who scored a 600 verbal. Note: When we talk about **percentiles**, we always mean the percent of the data *below* this value.

5. Estimate the percentile of a student who scores a 700 verbal on the SAT.