

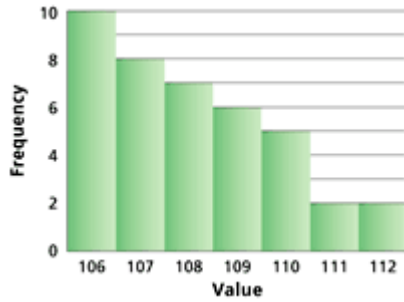
Lesson 12–7

Example 1 Classify a Data Distribution

Determine whether the data {112, 106, 106, 110, 107, 107, 112, 109, 106, 108, 109, 110, 111, 106, 107, 108, 106, 106, 111, 109, 110, 108, 110, 106, 106, 107, 106, 108, 106, 107, 107, 110, 107, 108, 107, 108, 109, 108, 109, 109 } appear to be *positively skewed*, *negatively skewed*, or *normally distributed*.

Make a frequency table for the data. Then use the table to make a histogram.

Value	106	107	108	109	110	111	112
Frequency	10	8	7	6	5	2	2



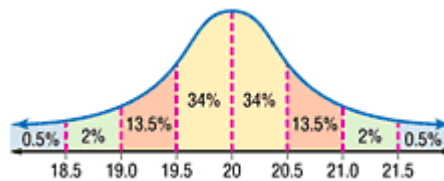
Since the histogram is high at the left, and has a tail to the right, the data are positively skewed.

Example 2 Normal Distribution

BUSINESS A home-based business found that the lengths of 5500 of their special candy canes for the holidays are normally distributed with a mean length of 20 centimeters and a standard deviation of 0.5 centimeters.

a. About how many of the candy canes were between 19.5 and 20.5 centimeters in length?

Draw a normal curve. Label the mean and the mean plus or minus multiples of the standard deviation.



The values of 19.5 and 20.5 are 1 standard deviation *below and above* the mean, respectively. Therefore, about 68% of the data are between 19.5 and 20.5.

$5500 \times 68\% = 3740$ Multiply 5500 by 0.68.

About 3740 of the candy canes are between 19.5 and 20.5 centimeters in length.

b. What is the probability that a candy cane selected at random had a length less than 19 cm?

The value of 19 is two standard deviations below the mean. You know that about $100\% - 95\%$ or 5% of the data are more than two standard deviations away from the mean. By the symmetry of the normal curve, half of 5% , or 2.5% , of the data are more than two standard deviations below the mean.

The probability that a candy cane selected at random had a length less than 19 cm is about 2.5% or 0.025 .