Lesson 1.3.3

1-70. Answers vary depending on the guesses.

1-71. b. measure of spread is the same; measures of center have changed

c. Adding or subtracting *a* will change measures of center but not spread.

d. Adding or subtracting *a* will change measures of center but not spread.

1-72. a. The measures of center were multiplied by 1.8 and increased by 32. The measures of spread were only multiplied by 1.8.

b. See bold values in table below.

	Mean	Median	Standard Deviation	IQR
Centigrade	61.9	60.2	25.3	32.9
Fahrenheit	**143.4**	**140.4**	**45.5**	**59.2**

1-73. $\text{mean}_C = \frac{5}{9}(\text{mean}_F) - \frac{5}{9}(32) = 96.1°\text{C}$, $\text{med}_C = \frac{5}{9}(\text{med}_F) - \frac{5}{9}(32) = 92.8°\text{C}$, $s_C = \frac{5}{9}(s_F) = 10.4°\text{C}$, $\text{IQR}_C = \frac{5}{9}(\text{IQR}_F) = 18.4°\text{C}$

1-74. a. Answers will vary. The dot plot will likely be right skewed with a median of about 5 letters.

b. Answers will vary. The mean is usually about 6 letters.

c. Answers will vary. The dot plot is likely right skewed with a median of about 10 letters.

d. All of the statistics calculated in part (b) will be doubled.

1-75. a. Distribution has one peak, is right skewed, median is 46 and is the best measure of center because of the skew, IQR is 4 and is the best measure of spread because of the skew.

b. yes; 56, 57, 58, 59

c. skewed; right

d. Mean is approximately 48 and is to the right of the median which is 46; The distribution has a right skew. The mean is pulled toward the tail of the skew; the mean is pulled away from the median.

1-76. a.

Original Score (%)	16	22	24	27	21	18	32	28	19	23
New Score (%)	**56**	**68**	**72**	**78**	**66**	**60**	**88**	**80**	**62**	**70**

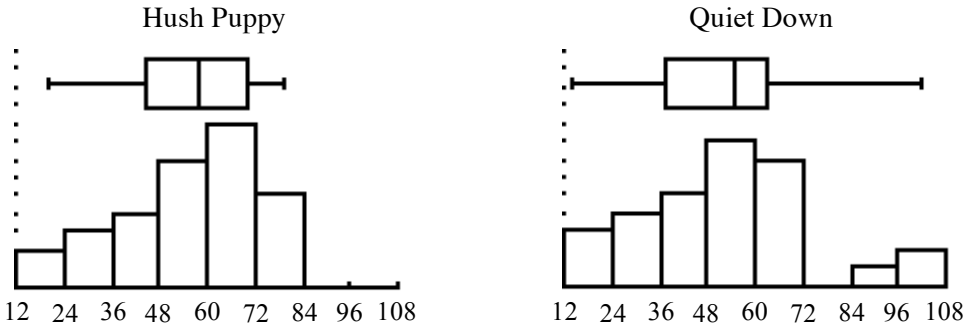
b. mean = 23%, standard deviation = 4.9216

c. mean = 70%, standard deviation = 9.8432

d. Adding a to the original mean when $b = 1$ increases the mean by the value of a.

e. b doubled the original standard deviation and the range. New standard deviation is 9.8432, range is 32.

1-77. a.



Hush Puppy: min = 19.7 dB, Q1 = 44.5 dB, med = 58.3 dB, Q3 = 70.1 dB, max = 79.5 dB; Quiet Down: min = 14.2 dB, Q1 = 37.4 dB, med = 54.85 dB, Q3 = 63.3 dB, max = 102.1 dB

b. Hush Puppy: The distribution is left skewed so its center and spread are best described by the median of 58.3 dB and IQR of 25.6 dB; there are no apparent outliers. Quiet Down: Has some potential outliers over 100 dB or is perhaps dual-peaked. The main body of data has a left skew. The center and spread are best described by the median of 54.9 dB and IQR of 25.9 dB.

c. Answers may vary. Unless a student is familiar with the decibel scale a reasonable choice would be the Quiet Down because its mean and median sound levels are less and the IQRs between the two are nearly identical.

d. The Hush Puppy looks better now because those three high readings from the Quiet Down model are a lot more significant. Perhaps the Quiet Down could be redesigned to eliminate those high readings.