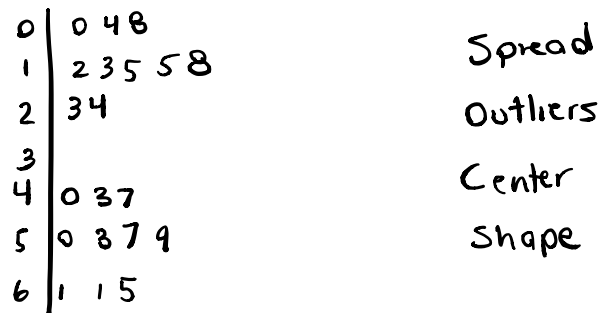# PRACTICE XI

1. In a random sample of 20 high school students, the number of text messages sent by each during the past few days were:

$$\{0, 4, 8, 12, 13, 15, 15, 18, 23, 24, 40, 43, 47, 50, 53, 57, 59, 61, 61, 65\}$$

(a) Create a stemplot of the number of text messages sent by students

```
0 | 0 4 8
1 | 2 3 5 5 8
2 | 3 4
3 |
4 | 0 3 7
5 | 0 3 7 9
6 | 1 1 5
```

Spread
Outliers
Center
Shape

(6 | 1 means 61 texts)

(b) Describe the distribution

Shape: appears bimomial with two distinct clusters and a gap between 24 and 40.

Center: the median # of text messages is $\frac{24+40}{2} = 32$

Spread: the range is $65 - 0 = 65$ text messages.

(c) Would a boxplot give more, less, or basically the same information?

- A boxplot would not show the two distinct clusters or the gap between 24 and 40.

2. A random sample of scores at a bowling alley one day gives the following summary statistics:

$$n = 26$$
$$\bar{x} = 132.34$$
$$s = 10.18$$
$$min = 113$$
$$Q_1 = 126$$
$$med = 134.5$$
$$Q_3 = 139$$
$$max = 160$$

Does this distribution contain any outliers?

$$IQR = 139 - 126 = 13.$$ Outliers occur $1.5(IQR)$ away from the median, in this case and values that are less than

$$134.5 - (1.5)(13) = 106.5$$ and greater than

$$134.5 + 1.5(13) = 158.5,$$

– there does not appear to be oultiers on the lower end of the distribution, but one or more outliers on the high end of the distribution.

3. The histogram below shoes the distribution of weights of the 21 bags of candy coming off an assembly line during a one-minute production interval.
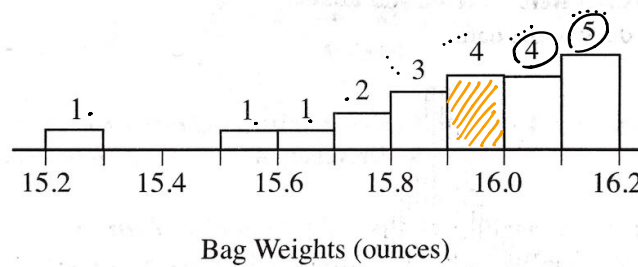
$$\frac{21}{2} = 10.5$$

Bag Weights (ounces)

(a) Write a few sentences to describe the distribution of bag weights for the one minute interval.

Shape: the distribution appears to be skewed left with a large gap between 15.3 and 15.5, and a possible outlier between 15.2 and 15.3.

Center: The median of the distribution is between 15.9 and 16 ounces.

Spread: The bag weights vary from minimum between 15.2 and 15.3 to a maximum of 16.1 to 16.2 ounces.

(b) One of the bags weighs 15.85 ounces. If this bag weighed 15.75 ounces instead of 15.85 ounces, what effect would this decrease have on the mean and on the median?

If the 15.85 ounce bag weighed 15.75 ounces, the mean would decrease by $\frac{0.10}{21}$. The median would be uneffected as the current median (~15.9) is above both 15.85 and 15.75.