Once a frequency distribution is made the data is converted to a graphic display. This may be in the form of a histogram (bar graph), a frequency polygon (line graph) or a pie chart (circle graph).

A. To make a Histogram from the frequency distribution:
   1. Determine the class mark for each class (average the upper and lower limit)
   2. Use the class marks from the observed values for the horizontal axis - labeling the center of bar with the class marks from lowest to highest - Note: do not leave out any class even if the frequency is zero
   3. Use the frequency for the vertical axis - begin with zero but the axis may be "broken" to indicate values have been left out

B. To make a frequency polygon (line graph) from the frequency distribution use the same procedures as those described for the histogram, but add an extra class mark on each end to bring the graph back to zero.

Use the frequency distribution to make a histogram (A) and a frequency polygon.

<table>
<thead>
<tr>
<th>Class</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 - 11</td>
<td>4</td>
</tr>
<tr>
<td>12 - 17</td>
<td>7</td>
</tr>
<tr>
<td>18 - 23</td>
<td>8</td>
</tr>
<tr>
<td>24 - 29</td>
<td>6</td>
</tr>
<tr>
<td>30 - 35</td>
<td>4</td>
</tr>
<tr>
<td>36 - 41</td>
<td>1</td>
</tr>
</tbody>
</table>

C. To make a circle graph use the charts on the homework handout for the data given above.
   1. Convert each class frequency to a decimal by dividing the frequency of the class by the total number of observations
   2. Multiply the percent for each class by 360 to convert to degrees - round answers to the nearest degree
   3. On the circle graph paper create sections for each class beginning at 0°, adding the calculated number of degrees per section. It may be necessary to adjust one section slightly if the total is not 360.
D. Sometimes we work backwards from the graphs to evaluate the data. Use the following graphs to answer the questions about the data represented.

D1. 

1. How many families visited the center?
2. How many families visited the center at least 6 times?
3. What is the modal class?
4. Construct a frequency distribution from the graph.

D2. 

1. What were the total dollar contributions?
2. Approximately what percent of the dollar donations went to 4 year schools?
3. How many more dollars were contributed to four year colleges than two year colleges?

D3. 

If the donations to colleges totaled $200,000 approximately how much went to 4 year schools?

HOMEWORK: 13.4 Problems 9, 10, 11, 12, 13, 15, 17, 19