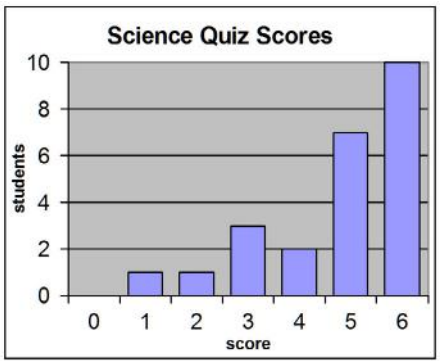
Using Mean, Median, and Mode

- The *mode* can be used with any type of data.
- The *median* can only be used if the data can be put in order.
- The *mean* can be used only if the data is numerical.

Whether you use mean, median, or mode depends both on

- the **type of data** and
- the **shape of the distribution.**

Example. This distribution of science quiz scores is heavily skewed (asymmetrical), and its "peak" is at 6. Clearly, most students did very well on the quiz.



Which of the three measures of center — mean, median, or mode — would best describe this distribution?

Mode: We can see from the graph that the mode is 6.

Median: There are 24 students. The students' actual scores can be read from the graph. They are 1, 2, 3, 3, 3, 4, 4, 5, 5, 5, 5, 5, 5, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6.

The median is the average of the 12th and 13th scores, which is 5.

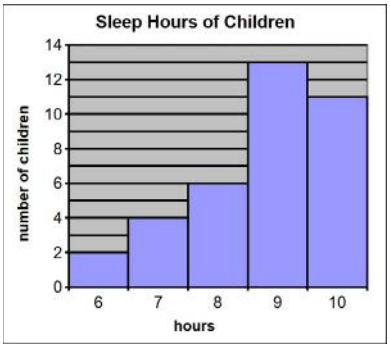
The mean is $\dfrac{1+2+3\cdot 3+2\cdot 4+7\cdot 5+10\cdot 6}{24} = 4.79167 \approx 4.79.$

Notice that the mean is less than 5, but the two highest bars on the graph are at 5 and 6. In this case, the mean does *not* describe the peak of the distribution very well because it actually falls outside the peak!

The median describes the peak reasonably well, but the mode is actually the best in this situation.

1. Fill in.

a. Is the original data numerical? _____



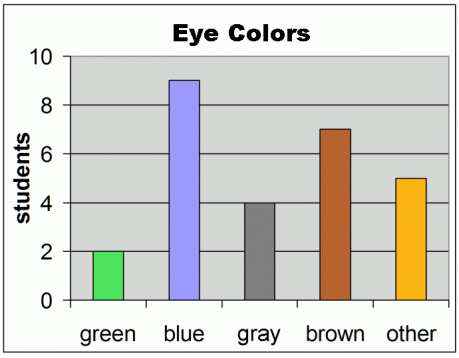
Calculate those measures of center that are possible.

The mode: _____ The median: _____

The mean: _____

Which measure(s) of center describe the peak of the distribution well?

b. Is the original data numerical? _____



Calculate those measures of center that are possible.

The mode: _____ The median: _____

The mean: _____

Which measure(s) of center describe the peak of the distribution well?