



Measures of center are often given as summary measures of data. In this activity you will explore measures of both center and spread and how the shape of a distribution influences these measures.

Problem 1 – Gasoline Prices 2004

Olivia is comparing average U.S. gasoline prices per gallon for two years, 2004 and 2005. The data for 2004 and 2005 are listed by month in the table on page 1.3.

1. Use the table on page 1.3 and the commands `mean(list)` and `stddev(list)` to find the mean and standard deviation of the 2004 data. **Note:** When you type the command, replace the quotation marks "`□`" that are currently in the cells.

Page 1.4 shows the dot plot and box plot for the 2004 data, each labeled **prices04**.

2. Use the graphs to find the median and the interquartile range (IQR) of the data.

Plot the mean on the box plot by pressing **Menu > Actions > Plot Value**, select the template `□□`, and then type `m04`.

3. Why are the mean and median different?
4. How do the mean and standard deviation work together to give information about the data?
5. How do the median and IQR work together to give information about the data?



Problem 2 – Gasoline Prices 2005

On page 1.4, remove the plotted mean by pressing **Menu > Actions > Remove Plotted Value**. Then change the variable for both graphs to **prices05** to see the prices for 2005.

6. What are the mean and standard deviation of the 2005 gas prices?

7. What are the median and IQR of the 2005 data?

Plot the mean on the box plot by pressing **Menu > Actions > Plot Value**, select the template , and then type m_{05} .

8. Is the mean greater than or less than the median? Why?

9. Olivia wants to compare the two years. Using all the data you have, which would be the best range of values for her to use for the majority of gas prices in 2005.

10. Which would be the most accurate measure of the center of each set of data, mean or median? Why?

11. Help Olivia compare the gas prices for 2004 and 2005.

12. On page 1.4, change the variable to **prices06** for both graphs. The hypothetical data is presented for 2006 gas prices per gallon. Which do you think would most accurately represent the center of the values, the mean or the median? Why?