> The one universal ever-operating law throughout has been the law of change.
> Nature never stands still and never duplicates herself. Life is always in the process of
> becoming something else. - *Laurence M. Gould (b. 1896-1995) U.S. geologist*

PLOTTING CHANGE OVER TIME
Recognizing & Describing Different Types of Change As Depicted in Time Series Plots

☐ Look carefully at each of the time series plots # 1-7 and
    compare and contrast them.

☐ Then in the space to the right of each graph, briefly describe the
    kind of time series change that the plot is depicting. (Use
    the hints in the box below to write your descriptions.)

☐ Lastly, select the plot below (#1-7) that you think best
represents the type of change depicted by the **Keeling Curve** ==>
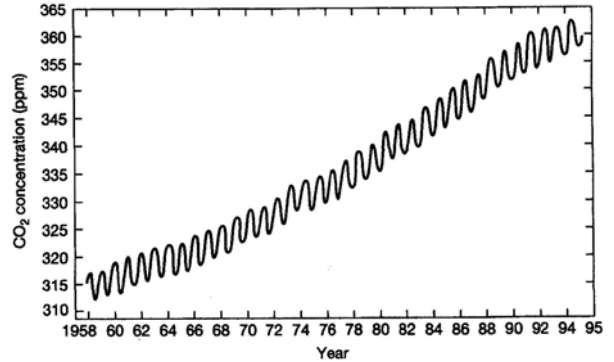
    Your answer: Plot #_____ is the most like the Keeling Curve

---

HINTS: Here are some terms that will help you describe time series changes more precisely in fewer words:

- **Mean** = average (a "constant mean" for a time series can be represented by a horizontal line with roughly the same amount of variation above and below the line in the data series)

- **Variance** = the range of fluctuations (wiggles) above and below the mean (statistically the variance is the square of the standard deviation about the mean)

- **Periodic** = perfect oscillations (fluctuations) (going up and down regularly or in a perfect wave-like motion)

- **Quasi-periodic** = almost regular oscillations (in nature things are quite often quasi-periodic rather than perfect oscillations)

- **Trend** = a line of general direction (increasing or decreasing)

PLOTS: Different Types Of Change As Depicted In Time Series Plots

[NOTE: The description for PLOT 1 is done for you, to give you an example.]
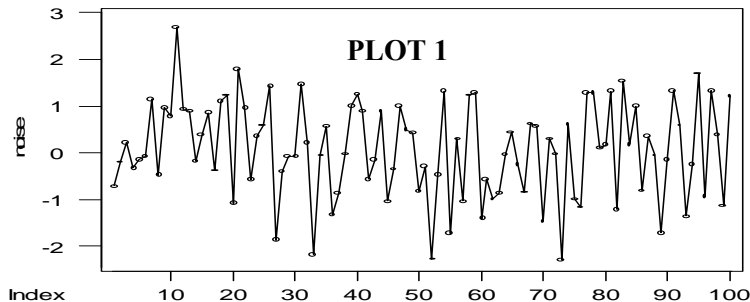
Description:

 This plot appears to go up and down without any regular pattern (e.g., randomly); there are about as many points above the time series mean (average) as below; and the range of wiggles above and below the mean seems to be about the same over time.

PLOT 2

PLOT 3

PLOT 4

PLOT 5

PLOT 6

PLOT 7