Carbon Dioxide Emissions

The data on the back of this sheet shows the **Carbon Dioxide Emissions in Canada** from 1960 until the year 2000. You will be analysing the data and making predictions.

Key words: forecasting, back-casting, interpolation, extrapolation, reliability

- Using technology (e.g. Excel) plot a scatter plot of the Carbon Dioxide Emissions (column 2) over the span of the years (column 1) listed. Label the graph and remove the legend.
- Using the software perform linear regression analysis (line of best fit / trendline / LinReg). Include the *equation of the line* of best fit and the *correlation coefficient* (r^2). Also, you must change the y variable in the equation to $CO2_amounts$ and change the x variable to $(Year)$.
- Copy and paste the graph onto a Word document. Include headers, titles and write a brief introduction to the task, and using the equation editor write the equation of the line of best fit that you got from the regression analysis.
- Below the graph in your Word document answer the following questions...

Model Characteristics

1. State the 4 attributes of the correlation (type, direction, strength and outliers).
2. State the correlation coefficient (r^2) value and comment on the strength of the correlation based on this value. Does the r^2 value make predictions or calculations for this model accurate or reliable?

Calculations:

You must use the equation editor to show your work for your calculations in your document.

3. Using the equation for the line of best fit calculate the CO2 emissions in megatonnes in the year 1979. Is this interpolation or extrapolation? Compare your calculated value with the actual value from the data set. Comment on the differences. Why might there be a difference?
4. Using the equation for the line of best fit calculate the CO2 emissions in megatonnes in the year 2010. Is this interpolation or extrapolation? Is this forecasting or back-casting?
5. Using the equation for the line of best fit calculate the CO2 emissions in megatonnes in the year 1940. Is this interpolation or extrapolation. Is this forecasting or back-casting?
6. Using the equation for the line of best fit, calculate the year in which CO2 emissions will reach 800 megatonnes?