Fishermen in the Finger Lakes Region have been recording the dead fish they encounter while fishing in the region. The DEC monitors the pollution index for the Finger Lakes Region. The data table below shows this information for the past ten years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Pollution Index</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>2.5</td>
<td>147</td>
</tr>
<tr>
<td>1991</td>
<td>2.6</td>
<td>130</td>
</tr>
<tr>
<td>1992</td>
<td>8.3</td>
<td>210</td>
</tr>
<tr>
<td>1993</td>
<td>3.4</td>
<td>130</td>
</tr>
<tr>
<td>1994</td>
<td>1.3</td>
<td>114</td>
</tr>
<tr>
<td>1995</td>
<td>3.8</td>
<td>162</td>
</tr>
<tr>
<td>1996</td>
<td>11.6</td>
<td>208</td>
</tr>
<tr>
<td>1997</td>
<td>6.4</td>
<td>178</td>
</tr>
<tr>
<td>1998</td>
<td>7.7</td>
<td>213</td>
</tr>
<tr>
<td>1999</td>
<td>4.6</td>
<td>189</td>
</tr>
<tr>
<td>2000</td>
<td>3.9</td>
<td>175</td>
</tr>
<tr>
<td>2001</td>
<td>4.1</td>
<td>180</td>
</tr>
<tr>
<td>2002</td>
<td>3.5</td>
<td>155</td>
</tr>
<tr>
<td>2003</td>
<td>2.7</td>
<td>149</td>
</tr>
</tbody>
</table>

1) a) Enter the data and produce a scatter plot. Use the Index as the x-variable and the deaths as the y-variable.
   b) What is the meaning of slope in this model?
   c) Determine the equation of the line of best fit.
   d) Predict the number of dead fish for a pollution index of 15.
   e) What pollution index would result in the death of 150 fish?

* using the **STAT, EDIT** feature of the TI84+, the Index will be placed in L1 and the Deaths in L2.
* using the window shown **STAT PLOT 1 (2nd Y=)** is turned on and following the directions in (a) L1 contains the Index (x) and L2 contains the number of deaths (y).
* using the **WINDOW**, set the xmin/Max and ymin/Max appropriately.
* using the **GRAPH**, show the scatter plot.

2) Discussing which mathematical model best fits this data can be a very rich classroom conversation. When working with paper and pencil, this can be demonstrated using a piece of "linguine." In this model the slope of the line of best fit is:

\[
\frac{\text{Deaths}}{\text{Pollution}} \text{ deaths per unit of pollution.}
\]

* To determine the line of best fit using the calculator the **STAT CALC** feature is used and **#4 LinReg** is selected. By entering the arguments **L1 , L2 , (2nd #1, 2nd #2)** we are assured of the correct data sets being used in the calculation. Then we have to tell the calculator where to place the regression line **VARS ; Y-VARS 1 (Function), Y 1 ENTER.**
* In order to graph the Linear Regression Line just found we select the **Y= menu** and place our cursor at the function location of our choice.
* using the **GRAPH**, the scatter plot gives us a mathematical model with which to make predictions. Using this model you can answer parts (d) and (e).
FISH IN THE FINGER LAKES

1. Enter Data
2. Stat Plot
3. Stat Plot
4. Zoom Stat
5. Graph

6. Guess
7. Graph
8. Linear Reg
9. ax + b

10. Vars
11. Line Place
12. Y2 placed
13. Y2 Enter
14. Lin Reg
15. Y1 & Y2 On

16. Graph
17. Y2 only
18. Answer d
19. 2nd Calc.
20. x = 15

21. Delete outlier
22. Guess
23. Graph
24. 2nd
25. D

26. Diag. On
27. TI84+ Line
28. ax + b
29. place line
30. Y4 place

31. Correlate
32. Y3 & Y4
33. Graph
34. Y4 only
35. Zoom out

36. x = 15
Final Answer

x = 15  y = 306.47
**DESCRIBING ONE-VARIABLE DATA**

*Topic 1  Histograms and Frequency Tables from Raw Data*

(Explorations: pgs. 11 - 13)  
1) set up the plot  
2) set up the window

Let's explore the process of setting up a plot and window. Below are some key steps:

1. **Send & Receive**
   - Select the plot options.

2. **Phill**
   - Configure the window settings.

3. **Transmit**
   - Adjust the settings for better visualization.

4. **Receive**
   - Confirm the settings are correct.

5. **Stat Edit**
   - Review and adjust as necessary.

6. **Stat Plot**
   - Set the scale to 20.

7. **Zoom 9**
   - Explore the data with a closer view.

8. **Trace**
   - Examine specific data points.

9. **Window**
   - Fine-tune the display area.

10. **Nice Limits**
    - Auto-adjust the limits for a balanced view.

11. **X-scl=20**
    - Set the scale to 20 for a clear view.

12. **X-scl=150**
    - Experiment with a larger scale.

13. **Class Limits**
    - Define class limits for grouping data.

14. 

15. 

16. **Relative Freq.**

17. **Mod. Box Plot**

18. **Outliers**

19. **Mod. vs. Box**

20. **Side by Side**

**c) Why does City Hall appear to be taller after you change the Xscl = 20?**

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*Topic 6  Box Plots and Five-Number Summary*

(Explorations: pg. 21)

1) What is the Five-Number Summary?

<table>
<thead>
<tr>
<th>min#</th>
<th>Q1</th>
<th>med</th>
<th>Q3</th>
<th>max#</th>
</tr>
</thead>
</table>

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