

Using the TI-84 for Statistics in Biology

The calculator can be used to enter data from experiments. This data can then be manipulated to produce statistics such as mean and standard deviation and student t-tests. You can also download the data into programmes such as excel through a piece of hardware called the graph-link or TiConnect.

Basic Statistics: Mean & Standard Deviation

Data are stored in lists. If data are in the lists from previous experiments, the lists will need to be cleared. If no data is present, you are ready to begin the problem.

Press the STAT button. Either press 4 and do not press ENTER **OR** use the cursor keys to move down to ClrList and do press ENTER

You will now need to specify which list you want to clear. (You use the blue 2nd button to choose your list.)

Press 2nd and then press 1. Press ENTER.

You will now have cleared list 1 and you are free to enter the data.

- a) Press the STAT button again. The Edit function is highlighted by default. Press ENTER. Now enter the following data by pressing enter after each number.

9 enter 7 enter 6 enter 10, 4, 5, 6, 7, 9, 6, 9, 8, 7, 8, 5

- b) Press the STAT button again. Use the cursor arrows so that CALC is highlighted. Press ENTER to calculate a number of single variable statistics. You must specify which list you want to do the calculation for, so press 2nd then press the 1 to indicate that you want the statistics for L₁ and then press ENTER.

- c) What is the mean? _____, the standard deviation? _____, the number of statistics used? _____

Student's t-test

To test whether there was any difference in the size of trees growing on the top of a hill and at the bottom near a creek, some data were collected. The diameters of a random sample of ten trees on the hilltop and ten by the creek were measured.

A *t*-test can be used to find out if there was a significant difference.

Location	Height (feet)									
By Creek	50	75	23	63	34	75	40	44	80	10
Hill Top	15	10	24	30	9	26	5	24	10	13

- Clear your L₁ as specified in the instructions above.
- Clear your L₂ using the same procedure.
- Enter the **By Creek** data into L₁ and the **Hill Top** data into L₂.
- Push the STAT button
- Move the cursor to the TESTS menu.
- Press 4; the default should be Data (it will be flashing), Pooled should be highlighted as **Yes**
- Move the cursor down to the last row off the screen until you see the flashing Calculate.
- Press ENTER.
- What is the mean of List 1? _____ of List 2? _____
- What is the value of *t*? _____ How many degrees of freedom should be used? _____
- Use the chart of **Critical Values of t**. Is there a significant difference between trees on the hill top and trees by the creek? Justify your answer on the back of this page.
- Find the standard deviations for each list in your calculator. List 1 _____ List 2 _____
- What is the median value of each list? List 1 _____ List 2 _____