**Guide to TI-Nspire Technology**

This is a short guide and introduction into the many wonderful technologies of the Ti-Nspire Calculator. The Ti-Nspire is becoming the Ti-83 of the high school mathematics classroom. In this guide we will go over many of the basic applications that could be used in a high school math class. However there are endless useful and interesting applications of the Ti-Nspire. For more information check out TI-Nspire.com. We collected the information for our guide from the CliffsNotes guide to TI-Nspire Technology.

**The Calculator Application**

Evaluating Expressions:

First you must add a new Calculator page by pressing the “home” key then highlight “Calculator” and press “enter”. Next just press the appropriate keys to evaluate a simple numerical expression, and then press enter to see the expression and the result in fractional form. If you want the result in decimal form then press control, “ctrl” before pressing enter after typing in the expression.

Reusing a Previous Calculation:

You can copy an expression by selecting it with the arrow keys and then pressing “ctrl” “c” to copy the highlighted expression. To paste the expression when you want to use it again, just press “ctrl” “v”.

Generating a Sequence:

Clear the calculator screen by pressing “menu”, “Actions”, “Clear History”. Next press the number you want the sequence to start with and then “enter” to store that number in Ans. Next use Ans and type the expression of the sequence you want to show. Now press “enter” repeatedly. Each new result is based on the result from the previous calculation. For example you can show Fibonacci numbers and the Golden Ration this way.

Long Numbers versus Scientific Notation:

 The TI-Nspire can display results that our very large (or very small). After entering in an expression and hitting “enter” press the up arrow button and then the left and right arrow keys to scroll through the entire number. If you want the result in scientific notation press “ctrl” then enter after typing in the expression. However, and error message will appear if the result is too large.

The Expression Template:

To type in expressions such as square roots, nth roots, logarithms, matrices and others you can use the expression template. This is similar to equation editor in Microsoft word. It can be accessed by pressing the “ctrl” key followed by the “x” key. Use the arrow keys to select the expression you want to use and hit “enter”.

Working with Variables:

Variables can be stored, defined and deleted. They can be name from 1 to 16 characters long. To store a number as a variable type in the number you want to store followed by “ctrl”, “sto-> var”, what you want to name the variable, “enter”. To define a variable press “menu”, “Actions”, “Define”, then enter in what you want to define. For example, if you want to define “area(x)” as the area of a rectangle whose length is one more than twice the width, then after pressing “Define” you would type, “$area\left(x\right)=x\*(2\*x+1)$”. So now, if you type “area(5)” then “enter” you will get a result of 55. To delete a variable press “menu”, “Actions”, “Delete Variable” then press “sto-> var” to see a list of all your defined variables, highlight the one you want to delete and then press “enter” twice”.

Using the Catalog:

The Catalog contains all functions, commands, units, symbols, and expression templates to add into the entry line. To access the Catalog press the button that looks like an open book. There you will see 4 numbered tabs, 1: alphabetical list of functions, 2: List of math functions, 3: list of mathematical symbols, and 4: the expression templates. Press any letter key while in a tab in the Catalog to jump to the item that begins with that letter. When you find what you want to use, simply highlight it and hit enter.

**The Data and Statistics Application**

 This option usually works in conjunction with the List and Spreadsheet application. The biggest asset that this application brings is the ability to analyze single and two variable data by the use of graphs. These plots let the user analyze the data graphically and make the shape of the data visible. From here, it can be determined on what is the best method of statistically evaluate the data. Some of the numerical plot types that can be utilized are dot plots, box plots, histograms, normal probability, scatter plot, and x-y line.



Alongside with the numerical plots, there are also categorical plots. This option allows the user to sort and group the data to his/her specifications. It also allows the comparison of the data set across different plots. The charts found in this application are box charts, dot charts, and pie charts.

 One function of this application is that it can manipulate data being used in the graphs that are currently being worked on. For example, one is able to go into the Lists and Spreadsheet option and changed a piece of data that is plotted in a histogram. Once this is changed, the graph will respond accordingly. This will also work if you change something in the Data and Statistics application, and it will then change in the Lists and Spreadsheet application based on what was done. The way this can be done is by clicking on a data point on the graph and physically move it anywhere on the screen.

 This is not the only way to explore data while using this application. You may also change the type of plot, rescale the graph, add a moveable line, showing regression lines, showing residual squares, and to show a residual plot. Here is an example on how to show a regression line:

 

Same as before, you may change data on the graph, or in the Lists and Spreadsheet application to see the opposite application change accordingly. With the Data and Statistics option, data are always two-way linked. That is, a change in one of the applications will reveal a corresponding alteration in the other.

**The Graphs and Geometry Application**

Graphing and Analyzing Functions:

To get started we need to open a graphing page, we do this by going to the main menu and selecting the graphs and geometry application. Now on the page you will see that the cursor is located at the first function at the button of the screen. You will type in a function, just like on every other TI calculator, and then press enter. Now, the cursor will remain in the functions until you hit esc, at which point it will become a moveable arrow.

Changing the Windows:

The function may not be very helpful in the typical graphing window, so you may need to change it. There are several way in which you can change the window. First, if you hit the menu button and scroll down to windows you will see the abilities to zoom. If you select the Windows Settings you can put the values you would like in.

Also, you can change the screen by taking your moveable arrow and moving it, with the NavPad, over one of the counting notches on the graph. Once over that you will press ctrl and “the grab button”, center of the NavPad, this will latch onto the axis and will allow you to move the counting notches, changing the window. If you move the arrow to any of the max values in the axis and press the grab button twice you will be able to enter values in.

Everyday Class Work:

Now that we can graph and change the window let’s play around a little. Let’s put a point on a function. To do this, after a function is typed in, hit menu and go to points & lines, select point on. This will give you a little pencil that will allow you to draw a point on the line. Once the point is on the line you will be given the coordinates of that point. If you double click the coordinates with the grab button, you can then type in a coordinate on the line. You can also grab the point and move it along the line. This is help full because it will locate the max and min of the graph if you are near it. It does this will a little m, for min, and a big M for max.

How about tracing a function, to do this hit menu then Trace and select Graph Trace. You will now be able to move along the graph. If you have another function you can move that one by pushing the up arrow. To move both push the up arrow another time, this way you can see comparisons.

Let’s find the intersection points! If you have two functions that intersect we can easily find the intersection points. First hit menu, then points &lines, and then select intersection point(s). It will look as though nothing happened, but if you take the arrow and push the grab button on one function and then on the next you will see points and the coordinates appear. These of course are the points on intersection.

Creating and Analyzing Geometric Constructions:

We will start by opening a new graphing window. Once in the window, hit menu, then View and select Plane Geometry View. Now we can play a little. Plotting a point is just like plotting a point on a function, so give it a try. Once you have points, if you click on them and then press, ctrl menu, then select attributes, you will see you have the option to change the appearance of the point and you are able to lock the point there, so you don’t delete it by accident. We can also construct other things, like lines and shapes. The steps are simple so if we explain one you can work through the others. To construct a shape hit menu, then shape and then select a shape.

You can also measure the construction you have. You can measure distances, area, slope, angle and even integral. Again these are all very simple to use. If you plotted two points we will calculate the distance by, hitting menu then measurements, and then select length. Now, you will see the arrow, if you select a point by moving the arrow to it and hitting the grab button. The point will start to blink. Then if you select another point it will give you that measurement.