

# Introducing Next Step Technology

## Concepts

- Number Properties
- Euclidean and Transformational Geometry
- Data Management and Probability
- Gravity

## Materials

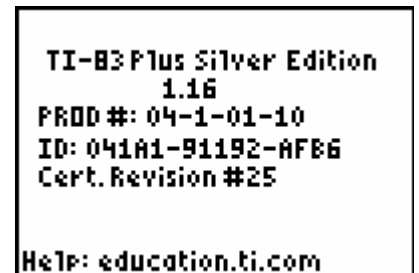
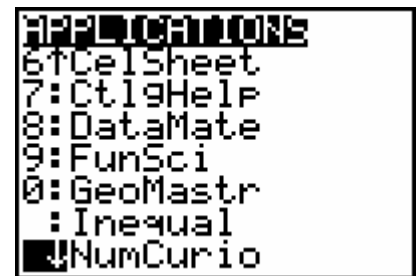
- TI-84 Plus SE
- TI-Navigator
- TI-Connect
- Science Tools
- Cell Sheet

## Overview

These activities are designed to introduce institute participants to new technology which may not be part of the regular institute materials.

## Introduction

1. The TI-84 Plus Silver Edition is a graphing calculator with Flash™ Memory. This means that it is not only electronically upgradeable (its operating system can be updated, just like a desktop PC) but you can add software applications (apps).
2. You can see a list of software titles currently installed on the TI-84 Plus SE by pressing the **[APPS]** key.
3. You will need the most current operation system on your TI-84 Plus SE Explorer in order to install new apps. See the section on TI-Connect software in order to find out how to upgrade your operating system without any cost to you.
4. To see more about apps check out the following activities in your booklet and visit our web site at <http://education.ti.com/global/latest.html>
5. This documents contains the following activities:
  - Introduction to TI-84 Plus Silver Edition
  - Introduction to TI-Navigator
  - Introduction to TI-Connect
  - Demonstrations for Science Tools and Cell Sheet Applications
  - A description of the applicable curricular materials.

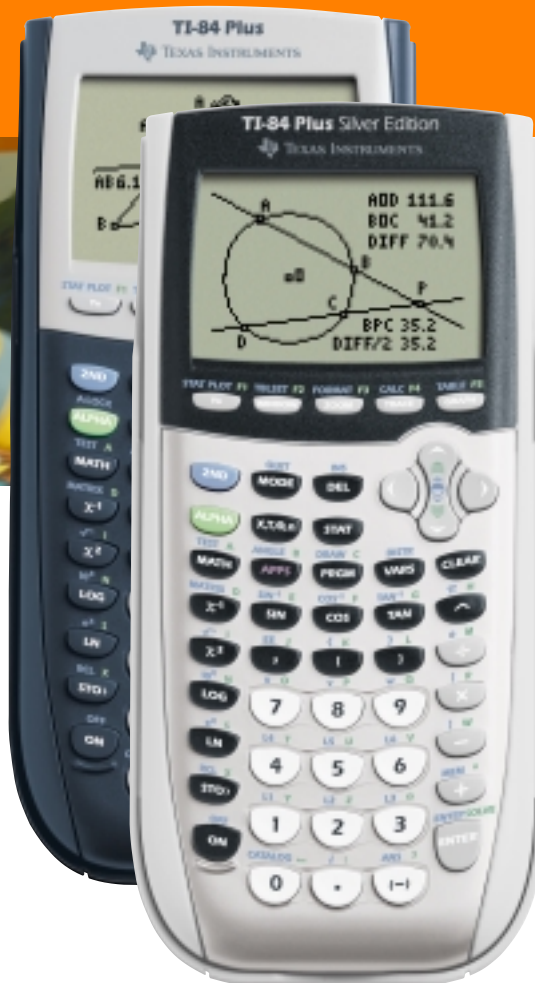




# The new TI-84 Plus family. New ways to get students thinking, interacting, connecting.



AD0376/a/US



Enhance your student's learning experience with the new TI-84 Plus and TI-84 Plus Silver Edition. How? Students can connect their TI-84 Plus to a teacher's TI ViewScreen™ panel and show their work to the entire class.\* In addition, the new TI-84 Plus and TI-84 Plus Silver Edition include a built-in USB port and cable, increased memory and popular Apps – preloaded – like Cabri® Jr.\*\*; the interactive geometry software. It's all part of TI's total solution for education, which includes the tools, training and curricular materials to help teachers and students succeed. For more information on the new TI-84 Plus family, visit [education.ti.com/84](http://education.ti.com/84).

\*Capability available summer 2004

\*\*Cabri is a registered trademark of Cabrilog

The new TI-84 Plus family,  
completely compatible with the TI-83 Plus family.

Tools

Training

Curricular  
Materials

[education.ti.com](http://education.ti.com)

 TEXAS  
INSTRUMENTS

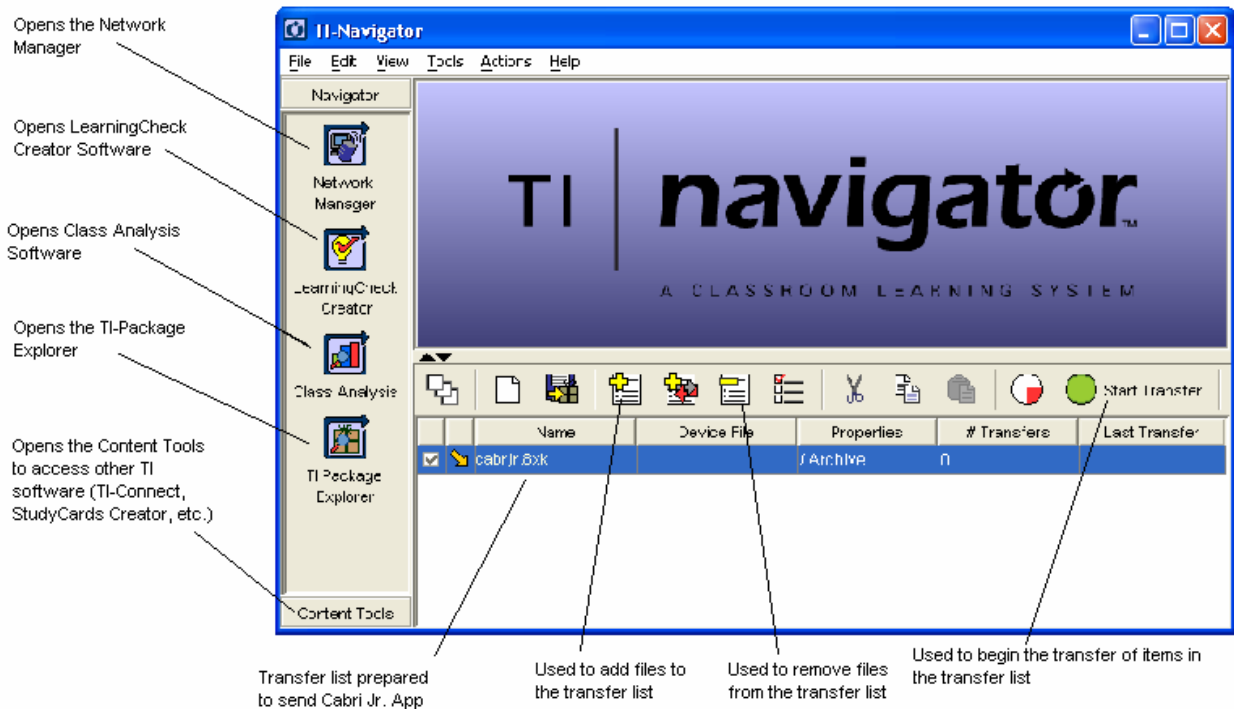
E - MAIL: [ti-cares@ti.com](mailto:ti-cares@ti.com) CALL: 1-800-TI-CARES

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## TI-Navigator Basic Skills

This section includes an introduction to some of the basic skills and functions of the TI-Navigator.

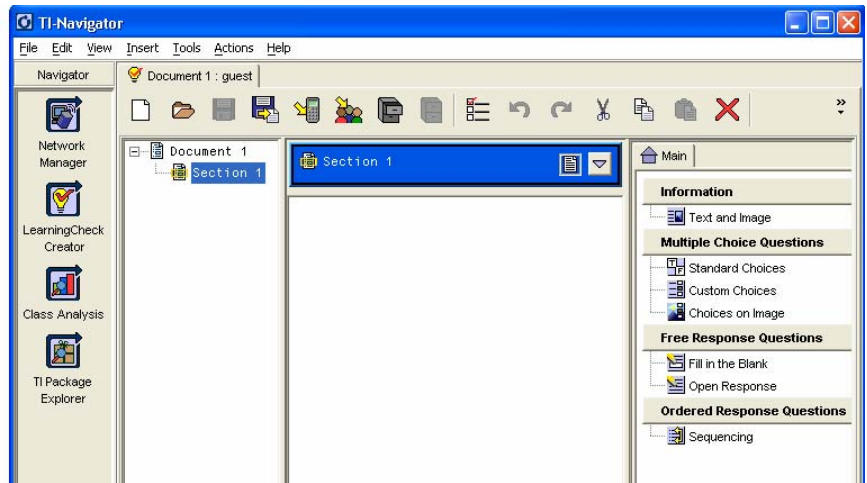


### Definitions

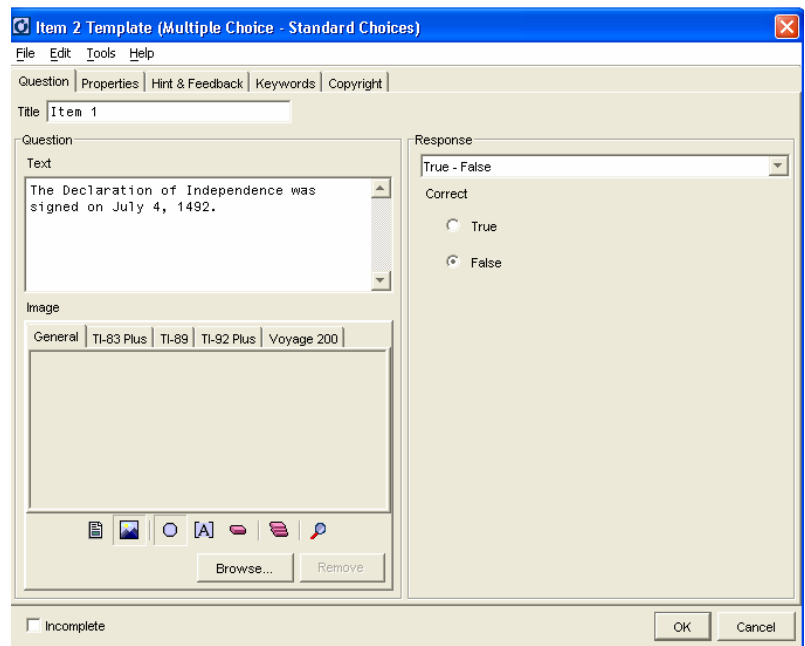
- **LearningCheck** – The student assessment component of TI-Navigator. Teachers can create educational documents including multiple-choice, fill-in-the-blank, open-response, and sequencing questions.
- **Class Analysis** – The software that is used to evaluate student work in LearningCheck. Teacher can receive complete and graded results of student work
- **Transfer List** – Any non-operating system file for a flashable TI handheld (except TI-73 families) can be simultaneously sent to or collected from all students. The transfer list shows all which files are ready to be transferred.
- **TI-Package** – Teachers can save the transfer list as a package for future classes. A TI-Package saves the files in the transfer list and compresses them to minimize storage.
- **Network Manager** – This is used to set up the communication between the teacher computer and student handhelds.

## Creating an Educational Document


Click on the Learning Check Creator software icon. There are four main categories: Information, Multiple Choice Questions, Free Response Questions, and Ordered Response Questions.

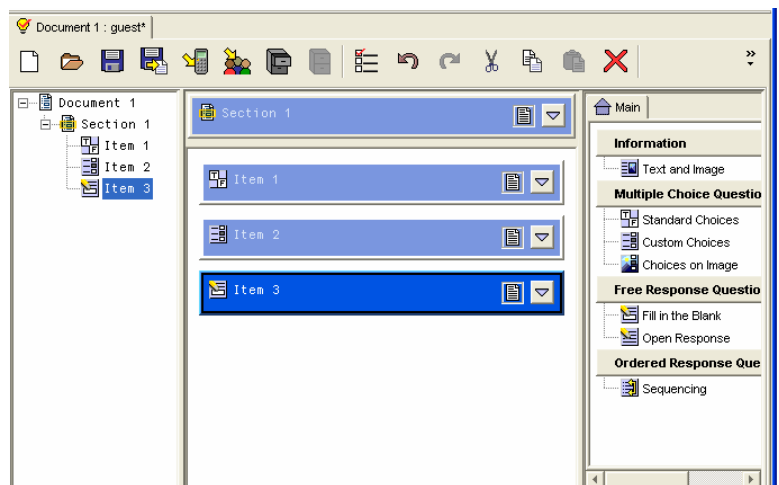


Click on the type of question desired and fill in the fields in the new window. For example to create a True/False Question click on Standard Choices. Then fill in each field with the desired information. The screen to the right shows a true/false question about the signing of the Declaration of Independence. Notice the correct answer is marked. This will be used later for grading.



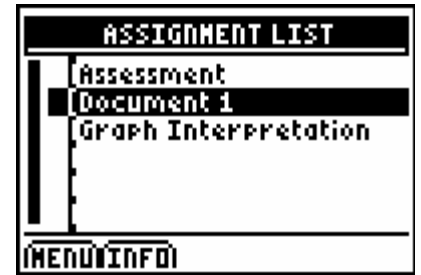
The next screen shows a three question quiz. This quiz contains a true/false question, a multiple choice question, and a fill in the blank question. To send this to the class click on the send to class

icon . All connected handhelds will now have the document and can answer the questions using the LearningCheck Application.

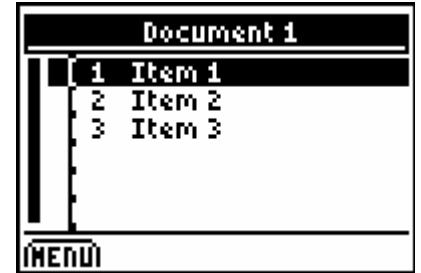


## Answering Questions Using LearningCheck

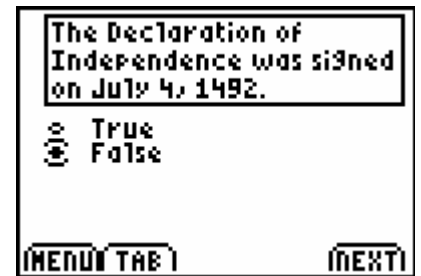
Press [APPS] and choose LearningCheck from the list of applications. After the title screen you will be asked to select an assignment. In this case the assignment is called Document 1. Select it from the list of assignment. Notice students can have multiple assignments on one handheld. After selecting an assignment students are prompted to enter their name then they begin the assignment.



The educational document is now ready for the student work. They may choose to answer questions in order or move to any item at any time. Directional arrows, soft keys (buttons below the words at the bottom of the screen, and the Enter key are the primary keys used to respond to the questions. To answer Item 1 press [ENTER].




To move the cursor to False the student must Tab between choices. To do this press [WINDOW]. This should move the cursor to the word False. To select this option press [ENTER]. This marks the student selection. To move to the next question the student may press [GRAPH].



## Collecting and Grading Student Responses


To collect and grade the student responses click on the Class Analysis icon. Then click on the collect from

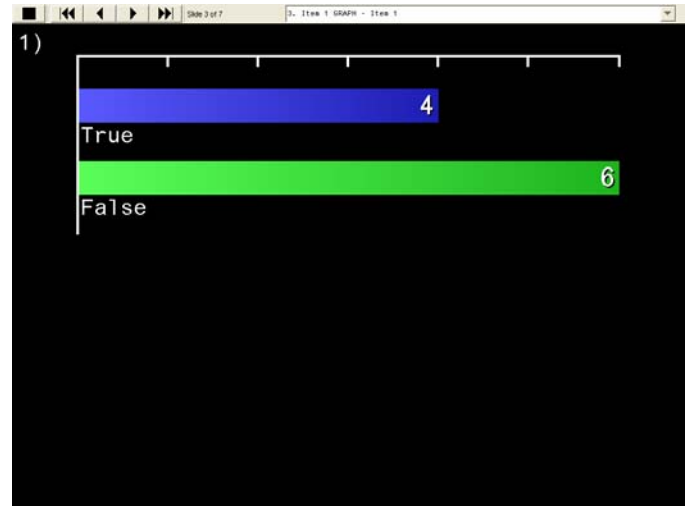
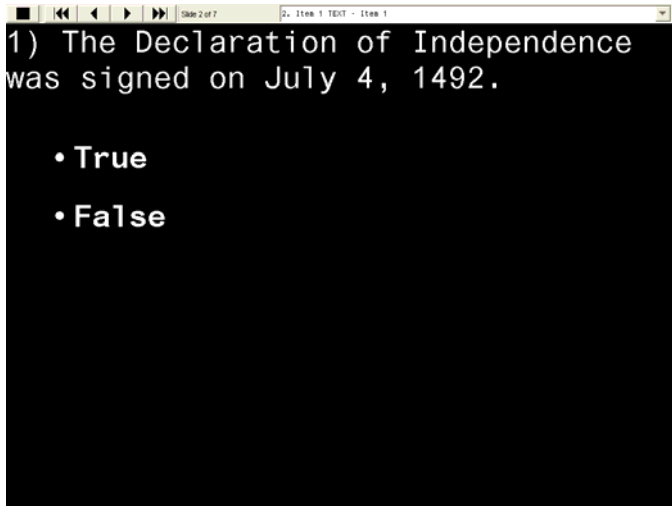
class icon  and select 'Start Transfer'. This will collect and grade all the student's responses. The picture to the right shows the results for the three question quiz for ten students. This information can be saved or copied to a spreadsheet. Also the information can be examined by student or by item for a more detailed analysis.

Student	1	2	3	Score	% Score
Maximum Score	1.00	1.00	1.00	3.00	100%
ABBY	1.00	0.00	1.00	2.00	67%
BECKY	1.00	1.00	1.00	3.00	100%
COREY	1.00	1.00	1.00	3.00	100%
EMILY	0.00	0.00	0.00	0.00	0%
RENEE	1.00	1.00	0.00	2.00	67%
RUDY	0.00	0.00	0.00	0.00	0%
SALLY	0.00	1.00	0.00	1.00	33%
TORI	1.00	1.00	1.00	3.00	100%
TRACY	1.00	1.00	0.00	2.00	67%
VINCE	0.00	0.00	0.00	0.00	0%
10 Students	0.60	0.60	0.40	1.60	53%

## Sharing the Student Results with the Class


For confidentiality sake the spreadsheet of graded results should not be shown to the students. However, students can see an anonymous bar chart of

student responses. Click on the Class Results Slide Show icon . This will generate slides like the following.



Students enjoy seeing how they did compared to the class without the fear of embarrassment. Also the teacher can quickly determine if students have mastered a concept or not.

## Sending a File to the Class Using the Transfer List

There are two ways to send a file to the class. Click on the 'Add New File to Transfer List' icon  and find the file or simply 'drag and drop' the file to the transfer list. Then click on 'Start Transfer' to send the file. All handheld files except operating systems can be sent via TI-Navigator. This serves two main purposes, quickly sharing information or data and preventing or minimizing student errors.



# Taking a ScreenCapture in TI-Connect

## Concepts

- Creating

## Materials

- TI-83 Plus SE
- TI Connectivity Cable USB
- Computer
- TI-Connect Software

## Overview

This activity uses TI-Connect to capture the screen off of a handheld. This image can be saved and used in word processing documents, webpages, or other computer software.

## Taking a ScreenCapture

1. To do this activity you will need to have something on the screen of your handheld you want to capture.
2. If not already done, connect the TI Connectivity Cable USB to the computer via the USB port. Also connect the other end of the cable to the communication port of the handheld.
3. Open the TI-Connect software by double clicking the icon in figure 1.
4. The TI-Connect software will open as shown in figure 2.



TI Connect

Figure 1

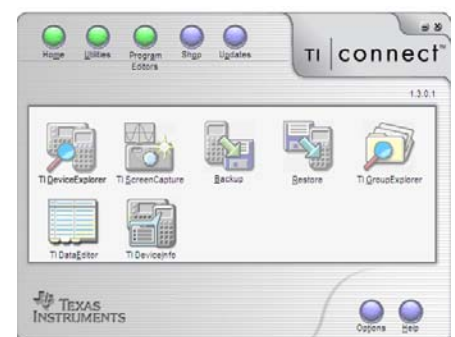
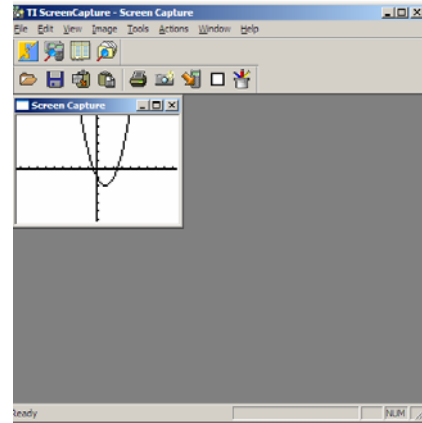


Figure 2

5. Click on TI ScreenCapture. This will pop up the screen capture window with the image of what appears on the handheld as in figure 3.
6. The image can be saved as a bitmap, a JPEG, or a TI image. Also the image can be copied and pasted into a word processor or other computer software.



**Figure 3**

# Transferring via TI Connect

## Concepts

- Transferring an APP to and from a handheld using TI Connect

## Materials

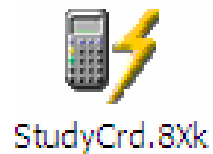
- TI-83 Plus SE
- TI Connectivity Cable USB
- TI-Connect

## Overview

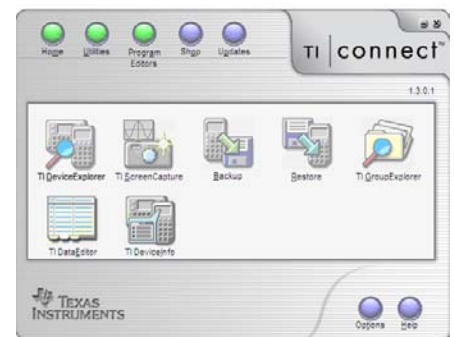
In this activity you will learn to transfer applications from a computer to a handheld and vice versa. Also note, this method will work to transfer other files as well.

## Transferring from Computer to Handheld

1. Download StudyCards from the web and save the file to your computer. The icon is shown as figure 1.
2. Open the TI-Connect software as in figure 2 (if it is not already open). Connect your handheld to the TI Connectivity Cable USB.



**Figure 1**



**Figure 2**

3. Click on TI DeviceExplorer. This will open a window displaying the contents of your handheld as in figure 3.
4. Click on the icon for StudyCards on the desktop and drag it to the TI DeviceExplorer window in figure 3. This will begin the transfer of StudyCards from the computer to the handheld. This process works for any handheld file.

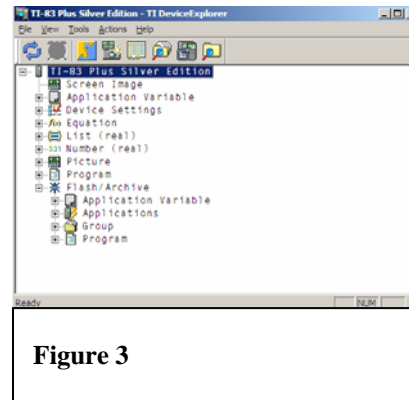


Figure 3

### Shortcuts for Sending to the Handheld

1. Any file you wish to send from the computer to a connected handheld can be sent as described above. However there are other ways that work as well
  - Right click on the StudyCards icon. Select Send To – Connected TI Device – Archive as in figure 4. This will send the application to the handheld without opening TI Connect.
  - Another method of transferring an application without opening TI-Connect would be to simply drag the icon for StudyCards on top of the icon for TI-Connect. This process will begin the transfer as well.
2. It is always a good idea to keep your batteries fresh. Some files will not transfer to a handheld with low batteries.

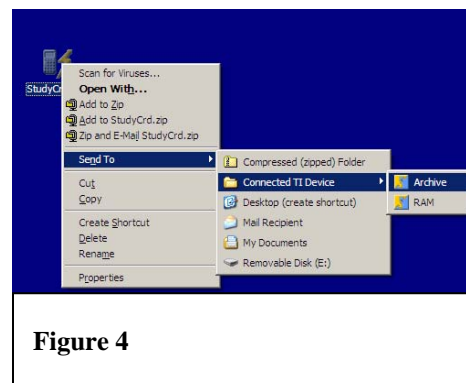


Figure 4

### Transferring from Handheld to Computer

1. To download a file from the handheld to the computer you must use the TI DeviceExplorer as in Figure 3. This is an outline view of the contents of the connected handheld.
2. Suppose we want to download a Notefolio file called DOGS. Notefolio files are stored as an Application Variable. Click on the plus to the left of Application Variable as in figure 5.
3. Select DOGS and drag it to the desired location. This will start the transfer of the Notefolio file to the computer.

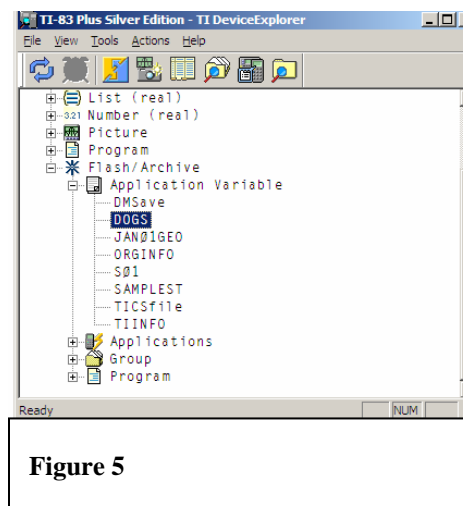


Figure 5



Enhance the flexibility of the TI-83 Plus specifically for the science classroom with the free Science Tools App. Easily do unit conversions, as well as use the graphing and vector tool, handle constants and conversions, and deal with significant figures with the significant figures calculator.

## Exploring the Significant Figures Calculator

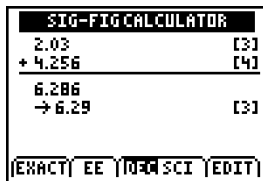
**1**

Press [APPS], using  $\uparrow$   $\downarrow$  to highlight and choose Science Tools. Press [ENTER]. Press any key to enter the Science Tools App.



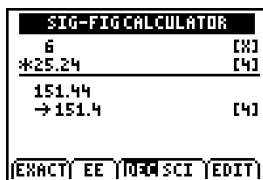
**2**

Choose 1:SIG-FIG CALCULATOR.



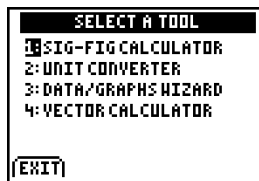
**3**

Type  $2.03 \sqrt{4.256}$  and press [ENTER]. Notice how the environment takes into account the number of significant digits when performing computations.



**4**

Press [ENTER] to clear the screen. Now input 6.0 and press  $\overline{=}$  [EXACT] (Note: press  $\overline{=}$  [WINDOW] [ZOOM] [TRACE] [GRAPH] to access the "soft keys" on the TI-83 Plus screen). This marks 6.0 as an exact value, and will not affect the number of significant figures in the final result. Press  $\boxtimes$ , and input 25.24. Press [ENTER].



**1**

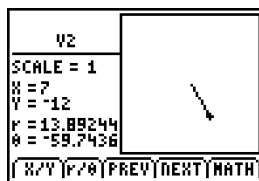
Press [APPS], using  $\uparrow$   $\downarrow$  highlight and choose SciTools. Press [ENTER]. Press any key to enter the SciTools App.

**2**

Choose 4:Vector Calculator

**3**

Using the cursor pad, draw a vector graphically. When satisfied press [ENTER]

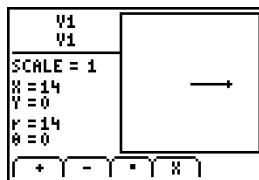


**4**

Press  $\overline{=}$  [X/Y] to input a vector's coordinates. Key in 7 for the X-value, and -12 for the Y-value, then press s [VIEW]. Notice the "r" and "q" values are computed

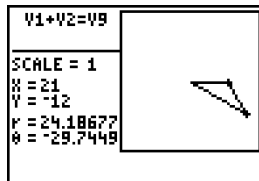
**5**

Press [MATH]. Choose V1 (the first vector) by pressing the [PICK] button.



**6**

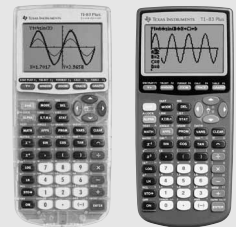
Choose [+] and then press [NEXT] to find the second vector. Once found, press [PICK]. Notice how the resultant vector is computed and drawn.





# CellSheet™ App

For the TI-83 Plus and TI-83 Plus Silver Edition

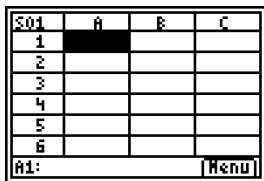


## How Much Do You Weigh on Jupiter? Or, The Effects of Gravity on Weight

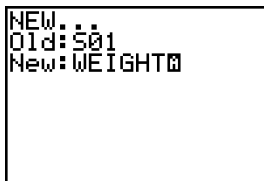
This App combines the power of a computer spreadsheet with the portability and versatility of the TI-83 Plus or TI-83 Plus Silver Edition. Spend less time in computer lab and extend the functionality of the handheld into other classes (for example, Business and Social Science). Create cell formulas using normal handheld functions and analyze spreadsheet data by using built-in plotting and statistics capabilities. Import and export variables, lists, and matrices and save spreadsheet files for future use. Import and export data from Excel®.



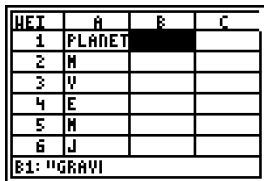
**1**  
Choose CellSheet from the APPS menu. A Splash screen will pop up first. Press any key to move into the App. Do not press [2nd][QUIT] as this closes the App.



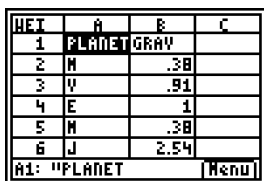
**2**  
Press any key to access the spreadsheet. The edit line with the cell reference is on the left side and the Menu soft key is above [F5].



**3**  
If the spreadsheet that opens already has contents, start a new spreadsheet. Press [F5] to access the menu, choose 1:File, and choose 3:New. Type in the name WEIGHT and press [ENTER]. Only the first four letters of the name appear in the top left cell.



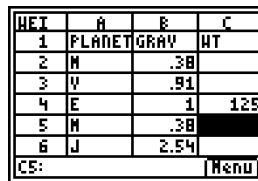
**4**  
Scroll to cell A1. Type the word "PLANET." In cells A2 through A10, type in the first letter of each of the planets in order from the sun (M, V, E, M, J, S, U, N, P). Make sure to put a quotation mark in front of each of these labels so that CellSheet understands them as text rather than variables.



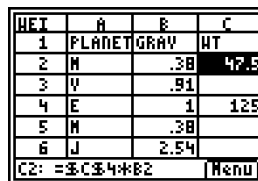
**5**  
Scroll to cell B1. Type in the word "GRAV," for gravitational factor relative to Earth. In cells B2 through B10, put the following factors of the other planets' gravities relative to the Earth's.

NET	A	B	C
6	J	2.54	
7	S	1.08	
8	U	.91	
9	N	1.19	
10	P	.06	
11			

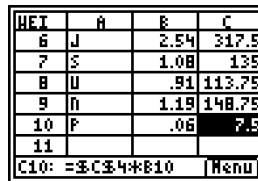
Planet	Factor	Jupiter	2.54
Mercury	0.38	Saturn	1.08
Venus	0.91	Uranus	0.91
Earth	1	Neptune	1.19
Mars	0.38	Pluto	0.06



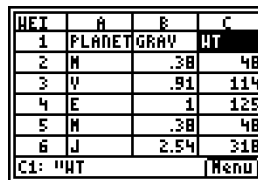
**6**  
To determine a person's weight by the different gravitational factors for the planets, scroll to cell C1 and type in "WT for weight. Scroll to cell C4 and type in a sample weight on Earth.



**7**  
To find a person's weight on Mercury, scroll to cell C2. Enter the formula = \$C\$4\*B2. Remember to use [STO] for = and [RCL] for \$. The \$ is needed for copying and pasting the formula to other cells without losing the reference to cell C4.



**8**  
To find the person's weight on Venus, scroll to cell C2. Press [F3] to copy it. Scroll to cell C3 and press [F4] to paste it. Scroll to cell C5 and press [F1] to choose a range to paste to. Scroll to cell C10 and press [F4] to paste to the range C5:C10.



**9**  
This produces a person's weight on Jupiter and all the other planets. In order to quickly see the magnitude of weight on the different planets, change the decimal format of column C. Press [F5] to enter the Menu, choose Options, Col Decimal. Enter C for Col and choose 0 for the decimal format. Press [ENTER], [ENTER] to accept. Column C should now have no decimal points showing so that it is easily seen that a person would weight the most on Jupiter, the least on Pluto.





## **Next Steps: Curricular Materials**

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Texas Instruments offers a wide variety of activity books and online curricular resources to help you integrate our technology effectively into your classroom. Below are a few offerings which may be of interest to you.

### **EXPLORATIONS™ Activity Books**

Written by teachers for teachers, the EXPLORATIONS™ Series of books cover topics to complement your professional development.

#### **Data Collection Activities for the Middle Grades with the TI-73, CBL and CBR**

by Ellen C. Johnston and David A. Young

#### **Activities for Middle Grades Science with the CBL 2 and the TI-73**

by Debbie Crawford, Raymond Leonard, and Cathy Roberts

#### **Math and Science in Motion: Activities for Middle School**

by Chris Brueningsen, Elisa Brueningsen, and Bill Bower

*Go to <http://education.ti.com/us/activity/books/overview.html> to find out more information and how to order.*

## **Next Steps: Curricular Materials, cont'd.**

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### **Online Activity Subscriptions**

Online subscriptions from TI's web site provide comprehensive, ready-to-use lessons and activities that tap the educational possibilities of TI technology to the fullest. With a subscription (many are free), you download lessons, activities and resources aligned with specific topics and national standards.

#### **EXPLORATIONS™ Online**

Get the most out of your TI technology with hundreds of activities written by teachers. Activities cover a variety of apps, handhelds, grade levels, and subject areas.

#### **The JASON Project: Science for the Middle Years (Free)**

Science class should be both investigative and intriguing for middle years' students. That's why Texas Instruments and The JASON Foundation have teamed up to provide unmatched, real-world activities paired with easy-to-use TI technology.

Go to <http://education.ti.com/us/activity/online/overview.html> to view samples and to subscribe.