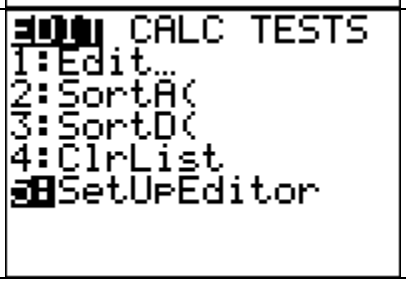
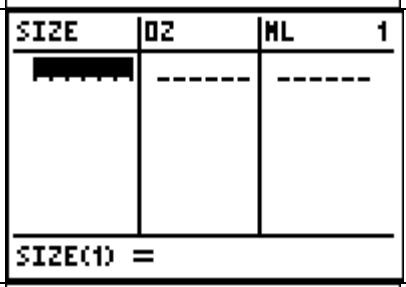
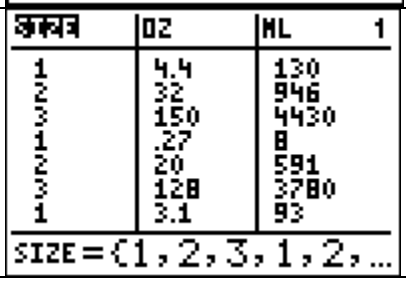
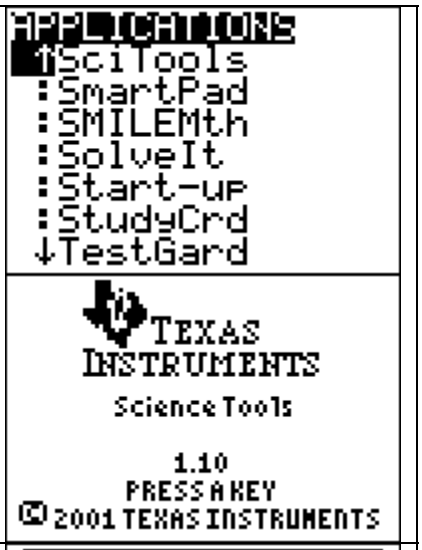
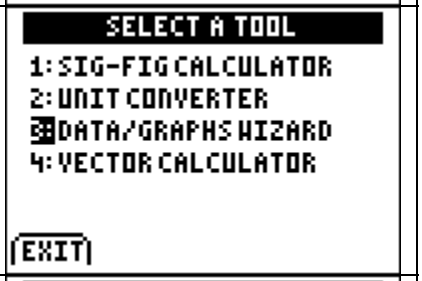
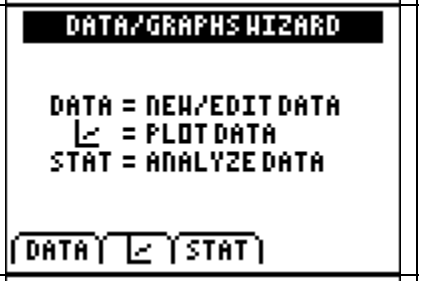
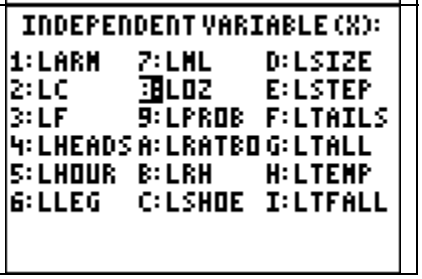
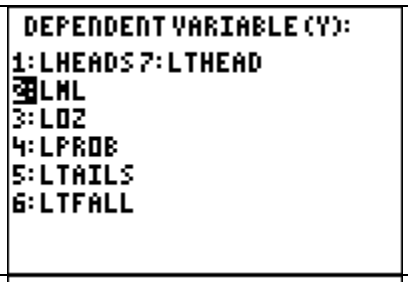
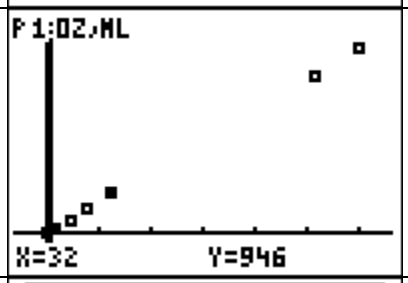
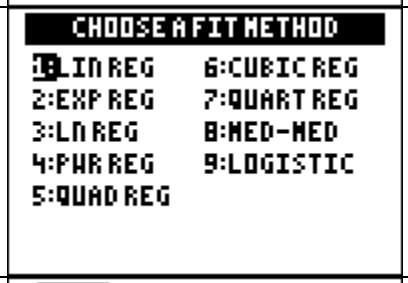
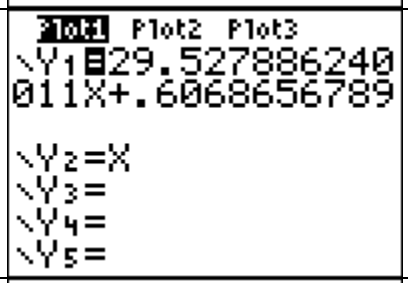
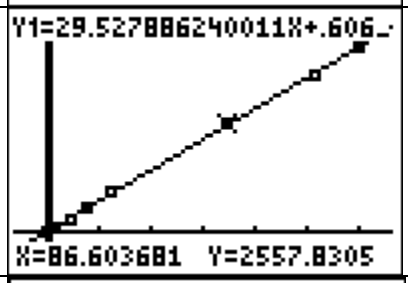
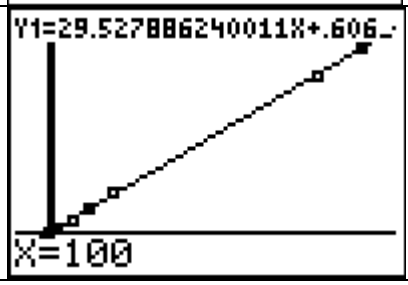
NSES Content Standards:

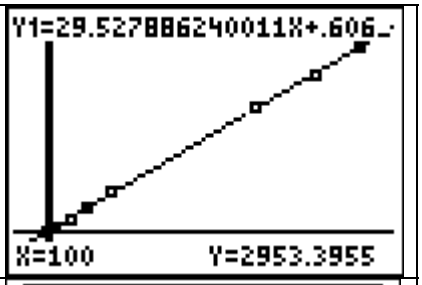
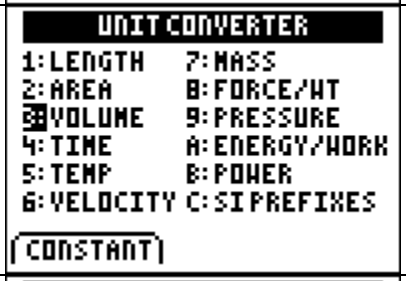
- Unifying concepts and processes in science.
- Science as inquiry.
- Physical science.
- Science and technology.
- Science in personal and social perspectives.
- History and nature of science.

Activity 4: An Ounce of Prevention	
In this activity we will: • Collect measures off of containers for the volume in both milliliters and ounces. • Combine your data with the others in your class. • Enter the data into your handheld and explore it. • Set up a plot to determine the relationship between the two measures. • Give this relationship a name. • Predict values for volumes in one unit, given the other. • Check your relationship with the Truth.	
As homework, find 3 containers – one large, one medium, and one small. Read the label and record the number of ounces and milliliters.	
Send your data to your teacher and then collect the data from the rest of the class.	
Enter the data into your handheld. Start by using the Setup Editor. From the Home Screen – press 2nd MODE CLEAR.	
To get the command you need to press STAT 5.	

Now we will name the two lists we plan to use to hold the measures we collected and a list for the size. Press 2nd ALPHA to lock into the alphabet mode. You will need to press ALPHA to take yourself out of the alphabet to get the comma. The three list names are: SIZE, OZ, and ML. Press ENTER to finish.	
Now look at the List Editor by pressing STAT ENTER.	
Let's code the data for size using 1 for small, 2 for medium, and 3 for large. Key in the data for the class. Double check it for accuracy.	
Can you guess a number and operation that you could use to change the ounces to milliliters, such as add 7 or divide by 2? Test out a few data pairs. How well did your class do picking small, medium, and large containers?	
To set up the plot we can use the SciTools APP. Press APPS ALPHA S to get down to the S APPS and then highlight the SciTools APP and press ENTER ENTER.	

	
Select the Graph Wizard.	
We already have the data entered so we can go straight to the PLOTDATA option. Press the softkey - WINDOW,	
Tell the computer to use the Scatter Plot by pressing the softkey Y=.	
Now select the independent variable (x). In this pass through we would like to use the ounce list OZ.	

Then you will need to let the computer know that the dependent variable will be ML.	
Look at the pattern in the plot. How well did we do with the distribution of small, medium, and large? Press [TRACE] and the [▶][◀] to explore. Notice the gap in the sample to the right.	
To get the name of the relationship press [2nd][QUIT] and select the kind of regression that is best.	
How does this expression relate to your guess on how to change from ounces to milliliter? Why would you expect b to be zero? Is it zero? Why? Press [Y=] to see it.	
Press [TRACE][▲][▶][◀] to explore the relationship between ounces and milliliters.	
Use your rule to predict values. Key in a number of ounces and press [ENTER].	

	
Now let's see the True relationship between ounces and milliliters. Press [2nd][QUIT][2nd][QUIT] to get back to the Menu to select the Unit Converter. Press [2] to select it.	
We have been studying volume, so select that option.	
We want to know what 1 ounce is in milliliters so we key in 1, highlight oz and [ENTER] then highlight ml and [ENTER] again.	
Notice the use of scientific notation. How well did we do? Test out some other values.	
Repeat the process going the other way. Let ML be the x-value and OZ be the y-value.	
What other units could you do this with? How about slugs and kilograms?	