

School District: Oil City Area School District
Location: Oil City, PA
Math Supervisor: Deborah Heckathorne
Technology: Casio FX-9750G Plus

Summary: Faced with budget restrictions on technology purchases and state exam scores slightly below the state average, the Casio fx-9750G Plus graphing calculator is implemented in the classroom, provides access for all students, and passes the test on all levels.

Who Am I?

My name is Deborah Heckathorne and I have been teaching mathematics for the past 28 years. The past 5 years have been spent as the K-12 Mathematics Supervisor for the Oil City Area School District in Oil City, Pennsylvania where I also teach Algebra II, Trigonometry, and Data Analysis and Probability. In addition to these responsibilities, over the past 8 years, I have also been analyzing the district's data from our state mathematics exams (the Pennsylvania System of School Assessment – PSSA for short).

My Calculator Experience & My Introduction to Casio

I was first introduced to Casio calculators at the Pennsylvania Council of Supervisors of Mathematics (PCSM) conference a little over 1.5 years ago. At that time, I was mainly attracted to Casio because of the price.

The district I work for is not as affluent as many other districts in the state and any funding budgeted to advance technology was being used to purchase computers. This was wonderful for our computer labs, but created a problem for our math department. While money was being spent on computers, no budget was allocated to purchase the graphing calculators that are permitted for use on the state mathematics exam. I had approximately 120 11th grade students who needed to pass the PSSA state exam in order to graduate. At that time, we had a set of 30 older TI-82 graphing calculators that were loaned to students during their class period. This was fine for a rotating class schedule, but was not ideal for homework, and was definitely not adequate when it came time for the state exam and we were not able to supply all students with a graphing calculator. 90 students had to take the exam without a permitted graphing calculator. Although my students performed just slightly below the state average, I firmly believe that their scores were greatly influenced by the fact that they were not equipped with the graphing calculators we had used in class. To help address this issue, the superintendent of my school district helped me secure a \$5,000 grant to be used to purchase graphing calculators.

As I began to research graphing calculators, I found that if I purchased the TI-83 Plus one-third of my students would still not have access to a graphing calculator. However, if I considered the Casio fx-9750G Plus I would be able to supply all of my classes. Upon further investigation I also found that the fx-9750G Plus graphing calculator had features comparable to the TI-83 Plus yet it cost half the price. This looked like the perfect solution to our problem, but it also created a new one.

We had 13 secondary mathematics teachers in the district that already knew how to use a Texas Instruments calculator and were not familiar with Casio. On top of that, the majority was of the mindset that “you get exactly what you pay for” and, therefore, the Texas Instruments calculators must be better because they cost twice as much as the Casio calculators. Fortunately, because of the budget crunch, we decided to keep an open mind and take advantage of Casio’s free professional development program. We agreed that if the Casio fx-9750G Plus was even almost as good as the TI-83 Plus, it would be to our benefit to switch the district to Casio. Here’s what we found.

What We Have Found

Training: Casio sponsored a trainer to come to our school district and provide us with a three-hour training session. While we still had much to learn, at the end of training, we were not only convinced that the Casio fx-9750G Plus was as good as the TI-83 Plus, but we were also surprised to find that, in many instances, it was better and easier to use.

Functionality: For instance, to *find the intersection of two lines or to find the maximum or minimum* of a quadratic function using the TI-83 Plus you need to go through several steps including entering lower and upper bounds for each point of interest. On the Casio, you simply press use the G-Solve function and go directly to the point of interest.

The Casio also has a *built-in Conics* program that is unbelievably easy to use and does not require using a separate application as on the TI. You just need to choose the general or standard formula and enter the coefficients.

The *built-in Dynamic Graphing* program is a wonderful teaching tool on the Casio. Using a linear equation, for example, this program enables the teacher to demonstrate the change in the appearance of a line as the slope or y-intercept is changed. The students can actually watch the line move up and down the y-axis as the y-intercept changes, or they can watch the line change from a positive slope to a negative slope. The Casio can also graph vertical lines.

These are just a quick few of the functionality advantages we have found with Casio. There are many more.

Resource Materials: We were also surprised to find that Casio has a wide range of calculator activities and workbooks. These range from free activities on the website, to workbooks available for purchase, to numerous comparison activities that demonstrate, side-by-side, how you do problems on both the TI-83 Plus and the Casio fx-9750G Plus. While we usually gravitate to the free activities as a result of our budget situation, these are all wonderful resources that have helped make our transition smooth.

Exam Scores: Since the transition to Casio, our PSSA state exam scores have also shown a very impressive and fast improvement. While this is certainly not scientifically based research and there are many changes that have been instituted, after my 8 years of analyzing the district's state exam scores there is no doubt at all that our scores have increased since we started using the Casio fx-9750G Plus. Our students went from performing slightly below the state average to well above the state average in every standard and/or anchor! No Child Left Behind has made it necessary for all school districts to show adequate yearly progress (AYP) in mathematics. Our students have already increased their level of proficiency on these exams to a level that they do not have to reach until the year 2011 and, in mathematics, the entire district outperformed all other area school districts at the high school level.

Many of the students attribute part of this success to the ease-of-use and the continuity of use of the Casio calculators.

Where Do We Go From Here

While we are almost there, we are still in the process of switching the entire district to Casio. The high school academic classes are using the fx-9750G Plus graphing calculators; the lower levels are using the Casio fx-300 scientific calculators; the middle school will use both of these calculators; and the elementary schools have access to the very basic Casio calculators. In all cases, we have been able to maximize our limited calculator budget by spending minimum dollars and getting maximum functionality.

For More Information About:

Casio fx-9750G Plus & fx-300ES

www.casioeducation.com

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