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Connecting Forumulas

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CMST SCOLLARCITY Lesson Plan Template-Lesson Plan using **TI Technologies** (Due Tuesday, July 27th)

Submit as hard copy AND electronically through ANGEL

Name: Socorro M. Sanchez
Grade level(s)/Subject taught: Geometry or Integrated Math
Objectives: Students will use the graphing calculator to solve quadratic equations. They will analyze the graph and/or table to factor and solve a quadratic equation. Students will then use this technique to solve word problems.

Items to include in your TI Technologies lesson plan: (use *your* area/discipline/concepts).

For the math teacher:

1. *Write* the Mathematical Concept or "key idea" that TI Technologies will be used to teach: (e.g. Students use mathematical modeling/ multiple representation to provide a means of presenting, interpreting, communicating, and connecting mathematical information and relationships)

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and/or…

For the Science teacher:

1b. *Write* the Science Concept or "key idea" that TI Technologies will be used to teach: (e.g. Organisms maintain a dynamic equilibrium that sustains life).

For your **TI Technologies** lesson and using the following prompts, please provide a rich **one-page, single-spaced** description or a *vision* of your best thinking on a way or ways you might teach the planned lesson using the TI technology. Pay special attention to the modeling package

in your description. Also, construct and submit a tentative rubric that you might use with your students. ** see example page 5

To begin the class on the application of TI graphing calculator I would first assess their knowledge and skills in solving quadratic equations. Using the overhead, I would present at least three (3) quadratic equations and ask the students to solve them by factoring or using the quadratic formula. Of the three (3) exercises, the first two (2) would be equations that could be solved by factoring and the last one would be solved applying the quadratic formula. After about five to ten minutes I would ask for volunteers to solve each exercise on the board (one at a time). I would ask them to explain their procedure and why they chose their method. The method they use would be written on the board. After the three (3) exercises are discussed, I would ask the class if they knew any other way to solve a quadratic equation. I would lead the discussion towards graphing the equation and finding the x-intercept of the graph. From here I would provide a ten (10) to fifteen (15) minutes demonstration on how to solve a quadratic equation using the graphing calculation. As I do the presentation, I would write the steps on the board. Special attention would be given to the importance of choosing the WINDOW and the different methods of finding the x-intercept, (using TRACE, using the CALC function, and using the TABLE). During the next lesson the students would be given exercises to practice. The exercises would include situations in which they would need to change the dimensions of the window and cases in which there is no solution. Working in groups of two or three, they would be asked to explain each solution. In the third lesson applications exercises would be introduced and solved using the graphing calculator.

My plan of assessment would be to have the student work in groups of two or three so the students that have had problems in the past solving quadratic equations or in using the graphing calculator can gain more confidence using these techniques as a meaningful aid to their work. The students would be given several quadratic equations and application problems to solve. For each exercise they would have to provide a graph and/or table and a written explanation for their solution. Groups would be asked to present an exercise to the group explaining all steps taken and the meaning of their solutions.

A continuation to this lesson would be to demonstrate the SOLVER application and have students compare both methods used. They could explain which method they liked best. They could also be asked to make a last of pros and cons of each method and suggestions of when to use each method.

The rubric I design would emphasize the ability of the student to use and analyze the information obtained from the calculator to solve the equations.

Rubric

3
Students graph equations selecting appropriate windows and obtain solutions by determining x-intercepts and/or table. A clear explanation of the solution is given.

2
Students can graph equations but obtain only one solution because an appropriate window is not used. Only a partial graph is presented.

1
Students can graph equations using an appropriate window but cannot determine the solution. Only a graph is presented.

0
Students cannot graph or solve the equations.

"...a rich **one-page, typed, single-spaced**, description or a *vision* of your best thinking…"

Prompts:

1. How will you assess the prior knowledge of the student?
2. How will you begin the lesson?
3. What are the teacher and students doing every 5-10 minutes? (Teacher Actions and Student Actions
4. How will you assess the learning for the lesson?
5. How will TI be integrated into your teaching? (i.e. you may want to discuss a problem or describe how you might use the chosen modeling package in your plan. How does the model/tool help the concept(s) to be taught)?

Using _____, I plan on having my students…
(software / modeling package(s)

Example: "I was thinking about beginning the class on [modeling X] by using the overhead to ask students what they know about X. From this brainstorming session, I might ask them to get into groups and discuss one or more of the ideas they gave me. After about ten minutes, I would have the students give their ideas on X and write them down on a transparency so they would be able to see them for the entire hour. From here, I would provide a 10 to 15 minute demonstration of the basics of using _____modeling software. I would use an conceptual example that they would find familiar with such as getting a cold and how it is transmitted. From here, I would have students at the computer stations using a prepared guide or tutorial to get them started on basic software usage. I expect that in a short time a number of students would "catch on" rather quickly and be able to help others. …….. By the third lesson, I suspect that most would be well on their way to development of their own or small group models using the _____software. My plan of assessment would probably be a group model so they would gain more confidence in using the software in a meaningful way. After the second or third lesson, I would ask them to choose from a list of thematic or topic areas that fit the software nice and develop a model using the technology. As a product, I may have partners share their model and describe to other small groups how it works. The rubric I design would be general at first so that I might see the kinds of the products the student were capable of creating. From the prototypes, I would hone my rubric to make the modeling product as challenging as possible without making it too difficult." Etc…

For all lesson plans and within the context of the lesson plan(s) you develop, design (add) a rubric that addresses your objectives AND "guides" your students to success in the modeling arena you choose (AS, Stella, GSP, TI, IP). The rubric should have three or four levels or mastery with the highest level [TARGET], which should detail what you might initially expect of the capabilities from a student doing the best s/he can do. **(etc…)**

Ex:

Target	Acceptable	Unacceptable
Model *uses at least 5 functions* of Agent Sheet Software.	?	?
Math / Science Concept thoroughly addressed. Described (*written*) in rich detail.		
Graphs are neat, accurate and based on data from the model.	?	?
Student is very capable of *describing the model to a small group of peers* and is able to respond meaningfully to questions about the model.	?	?
Defines exactly how the modeling software "helped" solve the problem.		