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### Graphing Quadratic Equations Using TI Calculator

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*The College at Brockport*

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# Lesson Plan Template

Name: Sandy Zalewski

Grade level(s)/Subject taught: Math 8

Objectives:

Students will be able to represent a quadratic relationship as an equation, a table and a graph  
Students will be able to find the maximum point using the calculator, a graph, and a table  
Student will be able to write an equation to represent a quadratic relationship

Mathematical Concept:

8.A.15 Understand that numerical information can be represented in multiple ways: arithmetically, algebraically and graphically  
8.R.7 Investigate relationships between different representations and their impact on a given problem.

Materials:

LCD Projector  
Graphing calculators  
Powerpoint - Quadratics  
Smart View software for the calculator  
Warm Up - Quadratics Warm Up  
Classwork Sheet – Quadratics Classwork  
Homework – Quadratics Homework

Warm Up:

Review work for previous day. Model rectangles with a fixed perimeter

Launch:

Walk through the process to find an equation for the rectangles with a fixed perimeter  
Walk through the process of entering the equation in the graphing calculator  
Walk through process of finding the maximum, and x-intercepts on the calculator

Explore:

Students will work in pairs to complete the class work using class notes as a guide. The problem is similar to the problem done in the launch.

Summary:

Have students share equation and draw a sketch of the graph on the board. On this graph we will label the maximum point and the x-intercepts.  
Review what is meant by the maximum area and how it is shown in the table and the graph  
Review what is meant by the x-intercepts and how they are shown in a table and a graph

The main objective of this lesson is to understand how to create an equation for a family of rectangles with a fixed perimeter. Students must also understand what the points on the graph represent. In previous lessons we have created tables and graphs for these rectangles. By bringing in the graphing calculator into this lesson it will reinforce the connection between the equation, table and graph. By showing students how to find the maximum point on the graphing calculator this helps student to understand where this maximum point is shown on the graph.

The lesson will start with a warm up. The warm up requires drawing various rectangles with the same perimeter. They will use their drawings to find the maximum area. This should take 5 -10 minutes. I will ask a student volunteers to come to white board ( I use the LCD to project my PowerPoint on the white board) to share the solution.

Next, I will use my PowerPoint to walk the student through guided notes. To help students understand how to find the equation. I start with specific length and ask students how they would find the width, subsequently leading to the width in terms of the length. Next, I will show students how to enter this equation into the graphing calculator, how to set the window, and how to move from table to graph and vice versa. Students should already be familiar with entering linear equations, so this should be a quick review. I will then use the smart view software to show the students how to find the maximum point and the x-intercepts. This should take about 15 minutes.

During the explore time, students will follow the class work sheet to use what they learned in the launch to solve a similar problem. Students will be allowed to work individually or with a partner. As students are working, I will be walking around to help struggling students, keep students focused and assess student learning. I will also listen for confusion or discoveries that should be discussed in the summary. This should take about 20 minutes.

In the summary, I will ask for student volunteers to share the equation and draw a sketch of the graph created in the first problem. We will label the maximum point and the x-intercepts and discuss what the coordinates of the points mean. We will discuss how to find the width of these points and other points on the graph. This should take about 5 – 10 minutes. A homework assignment will be given to further reinforcement the lesson.

**Rubric:**

10 points Individual Grade

- 10 – All questions are complete and all answers are reasonable
- 9 – 90% of the questions are complete and reasonably answered
- 8 – 80% of the questions are complete and reasonably answered
- 7 – 70% of the questions are complete and reasonably answered
- 6.5 – 60% of the questions are complete and reasonably answered
- 5 – 50% or less of the questions are complete and reasonably answered
- 0 – No attempt was made to answer any questions

