Teaching Learning Succeeding

Subject: Math
Grade Level: High School
DI Strategy: Think Dots

Quadratic Equation Think Dots

The goal of this lesson was for students to determine the process for evaluating, simplifying, solving, and graphing quadratic functions.

Students were given a formative assessment prior to this lesson to determine their current level of understanding of the lesson's stated goal. Based on the results of the assessment, students could be grouped in one of two ways.

Grouping Strategy #1:
Students could be divided into small homogeneous groups (2-3) based on readiness. Two tiered Think Dots activities were developed based on their readiness. I used different colored paper to distinguish between the two levels. Each pair/group was given a die and an activity card and the students completed the corresponding activities.

Advanced Group (Blue Paper)		**Proficient Group (Green Paper)**
1. Is (x + 3)(x – 1) quadratic? Why or why not?		**1. Is $y = x^2 – 2x + 3$ quadratic? Why or why not?**
2. Create a graph of the function $y = (2x + 1)(x – 3)$		**2. Create a graph of the function $y = 2x^2 – 4x + 1$**
3. The path of a baseball after it has been hit is modeled by the function: $h = -0.0032d^2 + d + 3$, where h is the height in feet of the baseball and d is the distance in feet the baseball is from home plate. **What is the maximum height reached by the baseball? How far is it from home plate when it reaches its maximum height?**		**3. Find the vertex of the function $y= -0.0032x^2 + x + 3$**
4. Simplify $\frac{-2+\sqrt{16}}{5+\sqrt{-9}}$		**4. Simplify (3 +7i) – (5 + 4i)**
5. Use the quadratic formula to solve: $3x^2 - x + 12$		**5. Use the quadratic formula to solve: $3x^2 - x - 12$**
6. Explain for to graph $y = x^2 +8x + 15$. Show your steps and your graph.		**6. Given $y = x^2 + 8x + 15$, find the AOS, vertex, roots, and sketch.**

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Grouping Strategy #2:
The students were broken up into heterogeneous groups based on their readiness allowing one partner to support the other. In addition, the questions were differentiated based on their readiness level. In this strategy, student were given the choice between two questions when they rolled the die. This allowed students to choose the question at their correct level of difficulty.

Quadratic Equations: Double Stuffed Think Dots

When it is your turn, choose the problem your team will do.	
1. Is (x + 3)(x – 1) quadratic? Why or why not?	**1. Is $y = x^2 – 2x + 3$ quadratic? Why or why not?**
2. Create a graph of the function $y = (2x + 1)(x – 3)$	**2. Create a graph of the function $y = 2x^2 – 4x + 1$**
3. The path of a baseball after it has been hit is modeled by the function: $h = -0.0032d^2 + d + 3$, where h is the height in feet of the baseball and d is the distance in feet the baseball is from home plate. **What is the maximum height reached by the baseball? How far is it from home plate when it reaches its maximum height?**	**3. Find the vertex of the function $y= -0.0032x^2 + x + 3$**
4. Simplify $\frac{-2+\sqrt{16}}{5+\sqrt{-9}}$	**4. Simplify (3 +7i) – (5 + 4i)**
5. Use the quadratic formula to solve: $3x^2 - x + 12$	**5. Use the quadratic formula to solve: $3x^2 - x - 12$**
6. Explain for to graph $y = x^2 +8x + 15$. Show your steps and your graph.	**6. Given $y = x^2 + 8x + 15$, find the AOS, vertex, roots, and sketch.**

For both grouping strategies the procedure for the activity was the same.
Partner #1 would roll the die to see which problem he/she needed to complete. Both partners would complete the problem. Once both partners were ready, partner #1 shared his/her answer. Partner #2 could either agree or provide partner #1 with suggestions to improve his/her answer. Students then switched roles and partner #2 rolled the die. Students continued in this way until all the boxes were completed.