

<b>Class</b>	
<i>Algebra II</i>	
<b>Unit</b>	
<i>Polynomials/Quadratic Equations/Quadratic Formulas</i>	
<b>Lesson</b>	
<i>Factoring Quadratic Equations to find x-intercepts</i>	
<b>Standards</b>	Domain 1c: Setting instructional outcomes
<i>CC.2.2.HS.D.5 - Use polynomial identities to solve problems.                  CC.2.2.HS.D.4 - Understand the relationship between zeros and factors of polynomials to make generalizations about functions and their graphs.</i>	
<b>Learning Objective(s):</b>	1c: Setting instructional outcomes
<i>SWBAT identify and factor quadratic equations in order to find their x-intercepts.</i>	
<b>Learning Target:</b>	1c: Setting instructional outcomes
<i>Today, we are using our prior knowledge of factoring, and we will be learning how to factor polynomials in order to find their x-intercepts. You will show me you can do this by completing an individual exit-ticket worksheet with a group. You'll know you've hit the target when you are confident in your ability to find the x-intercepts of polynomials. This will prepare you to graph polynomial equations.</i>	
<b>Instructional Materials/Resources</b>	1d: Demonstrating knowledge of resources
<i><u>Instruction:</u> Powerpoint presentation on projector/SmartBoard with use of iPad to fill in and instruct, YouTube video on factoring  <u>Learning:</u> Lesson packet (including: Warm-up problems, blank PowerPoint presentation, exit ticket, and homework problems), pencils, set of red, yellow, and green mini cones per desk group</i>	
<b>Prior Learning/Relationship to Unit Structure</b>	1e: Designing coherent instruction

*This lesson is the sixth lesson of ten. Students have already mastered the skills of adding, subtracting, multiplying, and dividing polynomials in prior lessons, and students should already have a familiarity in factoring methods from Algebra I. Students will use these methods in this lesson.*

**Anticipated Strategies and Difficulties**

1a: Demonstrating knowledge of content and pedagogy

*With this particular content, students may run into difficulties with the rules of factoring, as they may have not fully grasped it in Algebra I, they may also forget to set the x-values equal to zero in order to find the intercepts (yielding the opposite-sign values of answers), or may forget to put their answers in terms of the x-intercepts and put them in terms of their factors. These errors will be addressed before and during the lesson, and students will submit feedback on what was clear/unclear during the lesson. Students may also run into issues if they do not take sufficient notes/pay attention. Using prior assessment from the previous lessons will also help determine how ready students are for this lesson, and using these prior assessments will help me adjust my instruction of this lesson and the lessons going forward.*

**Launch/Warm Up/Anticipatory Set**

1b: Demonstrating knowledge of students

*As a warm up activity, I will first have students watch a YouTube video on factoring to remind students of those methods, and then students will complete a few problems on factoring that they had seen in their prior Algebra I course.*

**Exploration/Instructional Activities:**

1a: Demonstrating knowledge of content and pedagogy  
1e: Designing coherent instruction

*Students will receive a packet at the start of class, containing the warm-up activity, the blank PowerPoint lesson, their exit-ticket worksheet, and the homework assignment. This class will begin by watching a YouTube video on Factoring, followed by students completing warm-up questions on factoring. The lesson will be presented as a PowerPoint on a projector or SmartBoard, and I will be filling in the blanks and completing problems using an iPad and Apple Pencil. In this lesson, I would go over factoring expressions, and then discuss the difference between factoring expressions and factoring equations. Going forward, I would then teach students why we are factoring equations to find x-intercepts, and show students how to complete this extra step of factoring. The time spent on instruction will last no longer than 20 minutes for the sake of attention spans, and will be recorded and uploaded on the class website to be viewable by students at any time. Students will fill out the blank PowerPoint that is in their packet as I fill in the PowerPoint online. After completion of the lesson, students (who would already be seated in randomized groups) will work with their groups to complete the exit ticket worksheet, which will be scanned and turned in online before they leave class. The time spent in groups will allow students to discuss issues they had with their peers and figure out problems together. Students will also utilize mini cones on their desk group in order to let me know how they're*

doing (green cone = understand content, yellow cone = somewhat understand content, red cone = need help understanding). I will know they understood the lesson by the accuracy of their exit-ticket.

### **Differentiation According to Student Needs**

1b: Demonstrating knowledge of students  
1e: Designing coherent instruction

*For my student, Stephanie Fox, who has an IEP for learning support and struggles with algebraic concepts, I will implement additional help as follows. First, prior to instruction of the lesson (whether in her special education class or alone with myself), Stephanie will complete a series of online practice problems on factoring with the help of her special education teacher or myself. This will get her familiarized with the concept of factoring for the lesson, which is the major concept. During class, she will be given a separate packet from everyone, where the PowerPoint notes will be filled in, so she can focus solely on my instruction and discussion questions and not on taking notes. She will be placed in a desk group with one less person than the other groups, so that I can come over and aid this group more than others, and in turn, help Stephanie out as she needs it. She will turn in the same worksheet as the other students, but will only be required to complete the even numbers.*

### **Formative Assessment/Performance of Understanding**

1f: Designing student assessment

*The performance of understanding will be the exit-ticket worksheet that students will complete during class. This worksheet will contain 10 questions on factoring polynomials for their x-intercepts. As mentioned before, I will check on groups to see how they are doing on their worksheet and monitor their cone-color at each desk group. My formative feedback plan will be, at the end of the PowerPoint, to include slides asking students what was clear about the lesson and what was unclear. Students will use an app on their phones to send me a message from them about what was clear and what wasn't clear, and these messages aren't shared with anyone but myself. I will address these concerns with students as needed while either completing their worksheets or outside of class time, depending on the student and on the severity of the problem. Also, as a teacher, as mentioned, I will be available during group work for any questions/concerns as they may arise.*

### **Reflection/Synthesis/Closure**

1e: Designing coherent instruction

*As stated, students will complete an exit ticket worksheet that will be scanned with students' phones and turned in online for evaluation, which was an opportunity for the students to reflect on their progress. The students can reflect using the clear/unclear message (as stated above) and can resubmit their answers at the end of class if need be. Also, homework will be assigned to further practice this concept, to which students can begin working on during class time if they turn in their exit worksheet early (which will most likely be the case). Also, at the end of the PowerPoint lesson, I will mention a connection to the next lesson, to have students understand why this material is important to understand.*

### **Teacher Reflection**

4a: Reflecting on teaching

1. *During the lesson, when did the students get bored/lose attention?*
2. *Were students clear/unclear statements in direct correlation with how they did on their exit ticket?*
3. *Did I do everything I could to address any problems/lack of clarity that all students had?*