Data Lesson 2-Factoring

Grade: 8	**Subject: 8th Grade Math**
Materials: Worksheets, Plickers QR Code Cards	**Technology Needed: Active Board**

Instructional Strategies:

- ☐ Direct instruction
- ☐ Guided practice
- ☐ Socratic Seminar
- ☐ Learning Centers
- ☐ Lecture
- ☐ Technology integration
- ☐ Other (list)
- ☐ Peer teaching/collaboration/ cooperative learning
- ☐ Visuals/Graphic organizers
- ☐ PBL
- ☐ Discussion/Debate
- ☐ Modeling

Guided Practices and Concrete Application:

- ☐ Large group activity
- ☐ Independent activity
- ☐ Pairing/collaboration
- ☐ Simulations/Scenarios
- ☐ Other (list)
- ☐ Hands-on
- ☐ Technology integration
- ☐ Imitation/Repeat/Mimic

Explain:

Standard(s)

HSA.REI..1 Solve a simple equation and explain the process of reasoning step by step.
HSA.REI.A.3 Solve equations and inequalities in one variable

Objective(s)

I CAN *identify* different parts of the quadratic and identify what factors are needed to get the correct coefficients
I CAN *express* my answer in a factored form
I CAN communicate the reasoning on how this is possible starting with an assumption and showing that it does, indeed work.

Bloom's Taxonomy Cognitive Level: Knowledge, Understanding, Analyzing

Differentiation

Below Proficiency:
Pairing/Collaboration
Optional more difficult problems if finish early

Above Proficiency:
There is a more challenging partner worksheet.
Also able to problem solve themselves through new application problems

Approaching/Emerging Proficiency:
Work together to solve both upper and lower level questions.

Modalities/Learning Preferences:
Using different colors and set up for visual learners

Classroom Management- (grouping(s), movement/transitions, etc.)
Students able to group themselves while working with a partner on both worksheets. One student from each group will grab a #1 and #2 partner worksheet from the front of the room to work on together. When finished, they will hand it and grab the next homework worksheet.

Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.)
Students grab calculator and markerboards when enter the room.
Students work together quietly when working on exercises.

Minutes	Procedures
5 min	**Set-up/Prep:** Cut up worksheets Turn on projector Put table in front of rooms for students to grab.
2 min	**Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.)** Remember the quiz from yesterday? You all did so well! Do you remember the level 4 question that was asking you to factor? That is what we are going to learn about today. No one really got that right but we are going to learn how to do it today!
10-12 min	**Explain: (concepts, procedures, vocabulary, etc.)** So our goal is to factor this quadratic. Our goal is to get back to what our previous answers used to be with the two parenthesis. So we want to find two numbers that will multiple to equal the constant term and will add up to get the middle term. It is less confusing than it seems, lets try a few together. Can everyone grab a board and a marker? (We don't need graphing). Lets try x^2+5x+6. This used to be our answer but now we want our answer to be in two parenthesis. So the first thing we do is look at the last number and list its factors. In our case it is 6. What are the factors of 6? (1,2,3,6) So of those 4 numbers, which two add up to 5? (2 and 3) So our answer is (x+2)(x+3). When we have a plain x^2 meaning there is no number in front of it (no coefficient), we can always right (x)(x) Lets try another. This one try on your white board. Factor x^2+7x+6 What is the our first step, find the factors of 6. (give some time) Then find what adds to the middle term, or 7! So our factor were 1, 2, 3, and 6 and 1 and 6 add to 7 and multiple to 6 so we know that is what we need! (x+1)(x+7) It doesn't matter if you put 1 first or 7 first because you will always get the same answer when the signs are the same. Lets try it with the signs different. Factor x^2-8+15

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	Well what is our first step, find what factors the last term has. (1,3,5,15) now what adds to negative 8, none! But if we multiple 2 negative numbers together we get a negative number that is added but a positive number that is the product. So our answer would be (x-3)(x-5)! That's not too bad right? Alright we will try three more but I want to see how you are doing so do your work on your white board for this next one and I am going to pass out plickers cards while you are working. Go ahead and get started. $a^2+13a+42$. Why did you get what you did? Turn and talk with a partner. There is a sheet on your desk that has your name matched up with a number. There are numbers in the corner of the QR code. Now when you have your answer hold up the letter answer you want on the top. Be sure your finger is not over the code at all. I will walk around and scan your answer. Next one, tell whether the sum of the factors of the constant term should be positive or negative when you factor the trinomial? Now why is this the answer? Turn and talk with a partner. Now lets try $b^2+12ab+32b^2$ So if there is that b^2 at the end, what should we do? We should just add a b to the last terms of our parenthesis and we can check this by multiplying it out. Turn and talk with a partner and share what you got and explain how you got there.
30 min	**Explore: (independent, concreate practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)** I think you guys are well prepared to work independently. Get out your books and turn to page 215 and do 1-30 odd and 32-36.
3 min	**Review (wrap up and transition to next activity):** Why don't you finish up the problem you are on and then

Formative Assessment: (linked to objectives) **Progress monitoring throughout lesson- clarifying questions, check-in strategies, etc.** By having open communication, I can gage if they are catching on by their responses. Being there are g **Consideration for Back-up Plan:** I could have them grab whiteboards and give an example problem and walk around to see how they are doing with it.	**Summative Assessment (linked back to objectives)** **End of lesson:** Homework assessment has practice problems for everything covered in this lesson. It is also building off of previous knowledge **If applicable- overall unit, chapter, concept, etc.:** This part of the unit was one of the heights of this standard. It included some higher order thinking as well as putting together some key concepts. This reached a lot of level 4 questions towards this standard.

Reflection (What went well? What did the students learn? How do you know? What changes would you make?):