

Lesson Plan Template

Grade: 9/10th grade		Subject: Algebra I	
Materials: Pen/pencil, notebook, textbook, Homework Assignment		Technology Needed: Computer, SmartBoard, Geogebra, Laptops, Graphing Calculator	
Instructional Strategies: <input checked="" type="checkbox"/> Direct instruction <input type="checkbox"/> Peer teaching/collaboration/cooperative learning <input type="checkbox"/> Guided practice <input checked="" type="checkbox"/> Visuals/Graphic organizers <input type="checkbox"/> Socratic Seminar <input type="checkbox"/> PBL <input type="checkbox"/> Learning Centers <input type="checkbox"/> Discussion/Debate <input type="checkbox"/> Lecture <input type="checkbox"/> Modeling <input checked="" type="checkbox"/> Technology integration <input type="checkbox"/> Other (list)		Guided Practices and Concrete Application: <input type="checkbox"/> Large group activity <input type="checkbox"/> Hands-on <input checked="" type="checkbox"/> Independent activity <input checked="" type="checkbox"/> Technology integration <input checked="" type="checkbox"/> Pairing/collaboration <input type="checkbox"/> Imitation/Repeat/Mimic <input checked="" type="checkbox"/> Simulations/Scenarios <input type="checkbox"/> Other (list) Explain: Students will be using independent activity by graphing functions on Geogebra. They will be pairing/collaboration by talking with other classmates about their findings. They will be having technology integration by using graphing calculators and Geogebra.	
Standard(s) HS.F-IF.7* - Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a.) Graph linear and quadratic functions and show intercepts, maxima, and minima where appropriate. b.) Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c.) Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.		Differentiation Below Proficiency: For students who seem to be struggling, I will start with functions that have a power of 1 or 2 and explain to them what those functions are supposed to act like. I will pair these individuals with above proficiency individuals for group work and be sure to instruct above proficiency students to explain things to the below proficiency students. Above Proficiency: I will have above proficiency students complete a separate worksheet for homework that deals with functions that may be tougher to understand. This way they are not being singled out in class, but I can still challenge them in a way that is appropriate.	
Objective(s) <ul style="list-style-type: none"> • TLW be able to graph functions based on their properties. • TLW calculate local minima, maxima, and intercepts and use this information to graph functions. • TLW recognize what the graph of different functions looks like based on powers of variables. • TLW be able to graph an absolute value function. • TLW will be able to construct graphs of functions based off of the information listed above. 		Approaching/Emerging Proficiency: For students who are approaching/emerging proficiency, I will have them continue along the presented material to make sure they have an understanding of the material being presented. I will also include a couple of challenging examples on the homework and not grade them, but I will check their work/answers to see how well they grasp the concept and if they are ahead of schedule. I will also observe these individuals during group work and see their understanding when paired with other individuals.	
Bloom's Taxonomy Cognitive Level: <ul style="list-style-type: none"> • Synthesis • Knowledge • Analysis 			
Classroom Management- (grouping(s), movement/transitions, etc.) <ul style="list-style-type: none"> • Students will grab computer and sit at desk (if not, they violate classroom rule of no excess talking.) • Song will be played for 2 minutes to signal the time allotted for students to grab their computers and sit down. • Song will be played for 2 minutes to signal the time allotted to put their computers away and sit back down. 		Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.) <ul style="list-style-type: none"> • Students will have an after-class meeting with teacher if they cannot grab-put away computers in allotted time and quietly. • Students will fill out misbehavior sheet if they cannot stay on the website intended for this lesson. 	
Minutes	Procedures		
2	Set-up/Prep: Students will grab their computers and analyze the bell-ringer question. Students will answer the bell-ringer question and think of any questions they may have pertaining to this.		
3	Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.) Students will answer bell-ringer question that is posted on the SmartBoard and think about the questions they have.		

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	<p style="text-align: center;">There will be a group discussion pertaining to the bell-ringer and the teacher will go over the objectives for the day.</p>	
<p style="text-align: center;">20</p>	<p>Explain: (concepts, procedures, vocabulary, etc.)</p> <p>1.) Definitions – Function - a relationship or expression involving one or more variables Maxima - the greatest or highest amount possible or attained</p> <p style="padding-left: 40px;">Minima - the least or smallest amount or quantity possible, attainable, or required</p> <p style="padding-left: 40px;">End Behavior – The end behavior describes the graph as x of $f(x)$ approaches positive or negative infinity.</p> <p>2.) Direct Instruction will be given using SmartBoard and pertaining to different functions. Different things that will be discussed is how different functions look based on their powers. Examples will be given to the students to put in their notes. Also, students will be asked to graph functions on their graphing calculators to follow along with examples done on the SmartBoard.</p> <p>3.) Direct Instruction will be given using SmartBoard and explaining how to solve for different maxima, minima, and intercepts. Examples will be given to the students to put in their notes.</p> <p>4.) Direct Instruction will be given using the SmartBoard to find factorizations by identifying zeros along with demonstrating end behavior.</p>	
<p style="text-align: center;">23</p>	<p>Explore: (independent, concrete practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)</p> <p>1.) Students will be instructed to grab their computers while observing classroom rules. Once students have gathered their computers, they will be asked to go to Geogebra.</p> <p>2.) Once students have gone to Geogebra, they will be asked to graph different functions that will be posted on the SmartBoard. They will be asked to record different information about these graphed functions, including maxima, minima, zeros, and end behavior.</p> <p>3.) Students will be assigned to groups where they are paired up with several different classmates, and at this point they will discuss their findings with classmates. They will discuss what they found different about each function and if they found any patterns.</p> <p>4.) Students will return to their individual seats by observing classroom rules.</p> <p>5.) Students will be asked to report upon their findings. We will discuss findings as a class and see how we can apply this information to help solve graphs of functions going forward.</p>	
<p style="text-align: center;">2</p>	<p>Review (wrap up and transition to next activity):</p> <p>1.) Once classroom discussion is over, students will be assigned problems for their homework.</p> <p>2.) Students will be given a worksheet (the worksheet they are given will be based upon their proficiency level).</p> <p>3.) I will tell the students to have a good day and that I am available any time after school, or before school the next day if they have any questions that they need answered.</p>	
<p>Formative Assessment: (linked to objectives) Progress monitoring throughout lesson- clarifying questions, check-in strategies, etc.</p> <ul style="list-style-type: none"> • I will observe the class during Direct Instruction and see if I notice any students that need help with the content being introduced. • I will walk around during the Geogebra session and get a grasp upon the students understanding of the information. • <p>Consideration for Back-up Plan:</p> <ul style="list-style-type: none"> • As a back-up plan I would consider two things: • 1.) Offering additional assistance to any individuals who may be struggling with the material 	<p>Summative Assessment (linked back to objectives) End of lesson:</p> <ul style="list-style-type: none"> • Students will be given a homework assignment at the end of this class period. • A quiz will be presented over this unit because it is very important information going forward in mathematics. <p>If applicable- overall unit, chapter, concept, etc.:</p> <ul style="list-style-type: none"> • Examples from this chapter will be included on a chapter test 	

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- 2.) Have students ask a classmate who understands the material for some help. Peer on peer instruction is very effective.

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

- Overall, I thought the lesson went pretty well. The students really seemed to like the use of Geogebra. This helped them to gain a much better understanding of the graphing of different functions. Also, it allowed them to easily test many different functions and compare them to the mother function.
- I would change the above proficiency. Although I thought the functions I presented them with may be tougher to understand, they understood them pretty easily. What I would do is create some examples that are even more complex. Or, I am considered having them tutor the students who do not understand very well. As stated before, peer on peer instruction is very effective and hopefully this would allow the below proficiency students to come to proficiency much quicker.