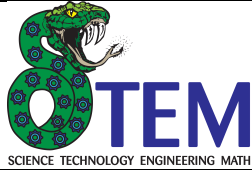


# Unit 1: Critical Thinking

Unit Length: 2 Weeks



## Mathematics Unit Plan

Teacher: Christopher

Grade: 11

Course: Pre-Calculus

Unit Title: Critical Thinking - Functions

### LEARNING TARGETS

LT 1: I can analyze functions using different representations (F-IF, 1-7)

LT 2: I can build new functions from existing functions (F-BF, 1-6)

### UNIT OVERVIEW

Overall summary of the unit, activities, tasks, and/or content.

The students will develop their critical thinking skills through understanding functions. They will be able to identify all the important parts of a function including: domain, range, y-int, zeros, symmetries, and even/odd. They will be able to interpret functions and identify important properties for applications including: interval of continuity, end behavior/limits, intervals of increasing/decreasing/constant, concavity, maxima/minima, and points of inflection. They will also be able to build functions that model relationships between 2 quantities, and build functions from existing functions. They will be able to describe and manipulate functions in different ways including: transformations of parent functions, arithmetic operations on functions, and compose compositions of functions. They will do all of this by learning to access the pertinent information from a variety of sources and use and apply it to the information involving functions.

### MOTIVATORS

Hooks for the unit and supplemental activities. (PBL scenarios, video clips, websites, literature)

#### Fun Math Videos

- <https://www.youtube.com/watch?v=OsEd7X5XuCU>
- <https://www.youtube.com/watch?v=1qHTmxlaZWQ>

#### Ranking of Best Jobs (4 out of the top 5 were math jobs)

- <http://www.careercast.com/jobs-rated/jobs-rated-2014-ranking-200-jobs-best-worst>

Week	Learning Targets	Materials & Resources	Instructional Procedures	Differentiated Instruction	Assessment
1	I can analyze functions using different representations (F-IF, 1-7)	<p><u>Technology</u></p> <ul style="list-style-type: none"> <li>-Ti-Nspire</li> <li>-IPad</li> <li>-Apple TV</li> </ul> <p><u>Online</u></p> <ul style="list-style-type: none"> <li>Map.mathshell.org-</li> <li>-A16 Sorting Functions</li> <li>-Teacher created content</li> <li>-YouTube videos</li> <li>-Khan Academy</li> </ul> <p><u>Classroom</u></p> <ul style="list-style-type: none"> <li>-Teacher created content</li> <li>-White Board</li> <li>-Scissors, glue, poster paper</li> </ul>	<p><u>Essential Questions:</u></p> <p>What defines a function?          What are the important properties of a function?          How are functions used in applications?</p> <p><u>Set:</u></p> <p>Students will be given a few functions that they already know and will be asked to graph them, and identify important features. Students will then be given functions that they do not know and will be asked to do the same thing.</p> <p><u>Teaching Strategies</u></p> <ul style="list-style-type: none"> <li>• Students will work through <a href="http://map.mathshell.org/materials/tasks.php?taskid=264&amp;subpage=apprise">http://map.mathshell.org/materials/tasks.php?taskid=264&amp;subpage=apprise</a> in pairs.</li> <li>• Students will be paired and required to explain to their partner how they arrived at their answers, each student will be given structured time to talk to their partner. They will then come to a consensus among themselves and we will then come together as a class and come to consensus.</li> <li>• The teacher will have the entire class sign up in Khan Academy. The teacher will sign up as a coach and have the students join the teacher's class. The teacher will give assignments via the recommendations option.</li> <li>• Unless another activity is planned the students will work on their Khan recommendations. The process should be; assign the work, students initially work individually, if they get stuck they can watch the khan videos, if they are still stuck they work collaboratively, if they are still stuck they seek out the teacher for direct instruction. The goal being that they learn to access and apply the information on their own leaving the teacher as an absolute last resort.</li> </ul> <p><u>Summarizing Strategy</u></p> <p>The students will be given a variety of functions or properties of functions and will be asked to find various properties or find a function that matches the properties. They will be asked to, in writing, explain their reasoning. The teacher will collect as an exit ticket.</p> <p><u>Homework</u></p> <p>Finish any Khan Academy recommendations that they do not complete in class.</p>	<p><u>Remediation</u></p> <p>Students will be put into remediation groups and given more direct teacher instruction. If I find any prerequisite knowledge that is missing I will assign out of class tutoring with me.</p> <p><u>Enrichment</u></p> <p>Any students that are getting ahead on their khan work will have a choice of extra khan assignments that will get them ahead for Calculus.</p> <p><u>Learning Styles</u></p> <p>Visual          Auditory          Kinesthetic          Collaborative</p>	<p>Give Khan Academy assignments by making "recommendations" to students. Require them to be finished before they take their summative.</p> <p>Exit ticket for the week's summary.</p>
2	I can build new functions from existing functions (F-BF, 1-6)	<p><u>Technology</u></p> <ul style="list-style-type: none"> <li>-Ti-Nspire</li> <li>-IPad</li> <li>-Apple TV</li> </ul> <p><u>Online</u></p> <ul style="list-style-type: none"> <li>Map.mathshell.org</li> </ul>	<p><u>Essential Questions:</u></p> <p>How are functions used in real life applications?          What kind of manipulations can we do to functions?          What are the various transformations of functions?</p> <p><u>Set:</u></p> <p>Students will be given a real life situation that can be represented as a function and</p>	<p><u>Remediation</u></p> <p>Students will be put into remediation groups and given more direct teacher</p>	<p>Give Khan Academy assignments by making "recommendations" to students. Require them to</p>

		<p>E14 Best Buy Tickets          -Teacher created content          -YouTube videos          -Khan Academy</p> <p><u>Classroom</u>          -Teacher created content          -White Board          -Scissors, glue, poster paper</p>	<p>asked to come up with methods that can help people visualize the possible outcomes of the situation.</p> <p><u>Teaching Strategies</u></p> <ul style="list-style-type: none"> <li>• Students will be paired and required to explain to their partner how they arrived at their answers, each student will be given structured time to talk to their partner. They will then come to a consensus among themselves and we will then come together as a class and come to consensus.</li> <li>• Students will work through <a href="http://map.mathshell.org/materials/tasks.php?taskid=286&amp;subpage=expert">http://map.mathshell.org/materials/tasks.php?taskid=286&amp;subpage=expert</a> in pairs.</li> <li>• Unless another activity is planned the students will work on their Khan recommendations. The process should be; assign the work, students initially work individually, if they get stuck they can watch the khan videos, if they are still stuck they work collaboratively, if they are still stuck they seek out the teacher for direct instruction. The goal being that they learn to access and apply the information on their own leaving the teacher as an absolute last resort.</li> </ul> <p><u>Summarizing Strategy</u>          Exit Ticket: Students will be given a variety of situations that can be represented by functions. They will be asked to build functions representing them and will be made to apply transformations on the functions, they will then have to explain what real world changes happened due to the transformations. If the exit tickets look good then give the summative assessment, otherwise remediate until they are ready.</p> <p><u>Homework</u>          Finish any Khan Academy recommendations that they do not complete in class.</p>	<p>instruction. If I find any prerequisite knowledge that is missing I will assign out of class tutoring with me.</p> <p><u>Enrichment</u>          Any students that are getting ahead on their khan work will have a choice of extra khan assignments that will get them ahead for Calculus.</p> <p><u>Learning Styles</u>          Visual          Auditory          Kinesthetic          Collaborative</p>	<p>be finished before they take their summative.</p> <p>Exit ticket for the week's summary.</p> <p>Summative assessment          Testing for Functions knowledge</p>
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