

## Green Township School District Gr. 8 Math Curriculum - July 2018

<b>Unit 6: Linear Functions</b> <b>(Approximate Instructional Time: 5 weeks)</b>		
<b>NJ Student Learning Standards</b>	<b>Suggested Standards for Mathematical Practice</b>	<b>Critical Knowledge &amp; Skills</b> <i>(Learning goals are for the Unit but may not necessarily be in sequential order.)</i>
8.F.B.4. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	MP.6 Attend to precision.  MP.2 Reason abstractly and quantitatively.  MP.7 Look for and make use of structure.	Concept(s): <i>Construct a function to model a linear relationship.</i>  Students are able to: <ul style="list-style-type: none"> <li>• Construct a function in order to model a linear relationship.</li> <li>• Interpret the rate of change and initial value of a linear function in context.</li> </ul> <b>Learning Goal 1:</b> Interpret the rate of change and initial value of the linear function in terms of the situation it models, and in terms of its graph or a table of values.
8.F.B.5. Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	MP.1 Make sense of problems and persevere in solving them.  MP.2 Reason abstractly and quantitatively.  MP.4 Model with mathematics.  MP.5 Use appropriate tools strategically.	Concept(s): <i>Analyze qualitative features of functions</i>  Students are able to: <ul style="list-style-type: none"> <li>• Analyze a graph.</li> <li>• Provide qualitative descriptions of graphs (e.g. where increasing or decreasing, linear or non-linear).</li> <li>• Given a verbal description, sketch a graph of a function based on the qualitative features described.</li> </ul> <b>Learning Goal 2:</b> Sketch a graph of a function from a qualitative description and give a qualitative description of a graph of a function.
8.SP.A.1. Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	MP.3 Construct viable arguments and critique the reasoning. of others.  MP.5 Use appropriate tools strategically.  MP.7 Look for and make use of structure.	Concept(s): <i>Association in data (bivariate measurement data)</i>  Students are able to: <ul style="list-style-type: none"> <li>• Construct and interpret scatter plots.</li> <li>• Analyze patterns of association between the two quantities represented in a scatter plot.</li> <li>• Describe clustering, outliers, positive or negative association, linear or nonlinear association when explaining patterns of association in a scatter plot.</li> </ul>

## Green Township School District Gr. 8 Math Curriculum - July 2018

		<p><b>Learning Goal 3:</b> Construct and interpret scatter plots for bivariate measurement data and describe visual patterns of association (clusters, outliers, positive or negative association, linear association and nonlinear association, strong, weak, and no association).</p>
<p>8.SP.A.2. Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit (e.g. line of best fit) by judging the closeness of the data points to the line.</p>	<p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.5 Use appropriate tools strategically.</p> <p>MP.7 Look for and make use of structure.</p>	<p>Concept(s): <i>Straight lines are used to model approximately linear relationships between quantitative variables.</i></p> <p>Students are able to:</p> <ul style="list-style-type: none"> <li>• Informally fit a line (of best fit) to a scatter plot that suggests a linear association.</li> <li>• Informally assess the model's fit by judging the closeness of the data points to the line (line of best fit).</li> </ul> <p><b>Learning Goal 4:</b> For scatter plots that suggest a linear association, informally fit a straight line and informally assess the model's fit.</p>
<p>8.SP.A.3. Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.</p>	<p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.4 Model with mathematics.</p> <p>MP.6 Attend to precision.</p> <p>MP.7 Look for and make use of structure.</p>	<p>Concept(s): <i>Straight lines are used to model approximately linear relationships between quantitative variables.</i></p> <p>Students are able to:</p> <ul style="list-style-type: none"> <li>• Given the equation for a linear model (line of best fit), interpret the slope and intercept.</li> <li>• Given the equation for a linear model, solve problems in the context of measurement data.</li> </ul> <p><b>Learning Goal 5:</b> Use a linear model (equation) representing measurement data to solve problems, interpreting the slope and intercept in the context of the situation.</p>
<p>8.SP.A.4. Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. <i>For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned</i></p>	<p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.4 Model with mathematics.</p> <p>MP.5 Use appropriate tools strategically.</p> <p>MP.7 Look for and make use of structure</p>	<p>Concept(s): <i>Categorical data: patterns of association can also be observed in bivariate categorical data through analyzing <b>two-way tables</b> containing frequencies or relative frequencies.</i></p> <p>Students are able to:</p> <ul style="list-style-type: none"> <li>• Construct and interpret a two-way frequency table containing data on two categorical variables.</li> <li>• Construct and interpret a two-way relative frequency table containing data on two categorical variables.</li> <li>• Describe any association between the two categorical variables using relative frequencies calculated for rows or columns.</li> </ul> <p><b>Learning Goal 6:</b> Construct two-way frequency tables and two-way relative frequency tables, and describe possible associations between two variables.</p>

## Green Township School District Gr. 8 Math Curriculum - July 2018

<p>chores at home. Is there evidence that those who have a curfew also tend to have chores?</p>		
<p><b><u>Interdisciplinary Connections:</u></b></p> <p><a href="#"><u>NGSS Appendix for Alignment</u></a></p>	<p><b><u>Science:</u></b></p> <p><b><u>MS-PS1 Matter and Its Interactions:</u></b>  <b>As part of this work, teachers should give students opportunities to work with ratios and proportional relationships, use signed numbers, write and solve equations, and use order of magnitude thinking and basic statistics:</b>  <i>Statistics and Probability (6–8.SP). Science example: Compile all the boiling point measurements from the class into a line plot and discuss the distribution in terms of clustering and outliers. Why weren't all the measured values equal? How close is the average value to the nominal/textbook value? Show the average value and the nominal value on the line plot.</i></p> <p><b><u>MS-PS3 Energy</u></b>  <b>As part of this work, teachers should give students opportunities to work with ratios and proportional relationships and basic statistics:</b>  <i>Statistics and Probability (6–8.SP). Science example: As part of carrying out a designed experiment, make a scatterplot showing the temperature change of a sample of water vs. the mass of ice added. (For Grade 8: If the data suggest a linear association, form a straight line, and informally assess the model fit by judging the closeness of the data points to the line. Just for fun, compute the slope of the line; what are the units of the answer?)</i></p> <p><b><u>MS-LS1 From Molecules to Organisms: Structures and Processes</u></b>  <b>As part of this work, teachers should give students opportunities to use order of magnitude thinking, write and solve equations, analyze data, and use concepts of probability:</b>  <i>Statistics and Probability (6–8.SP). Science examples: (1) For Grade 8: Use data in a <b>two way table</b> as evidence to support an explanation of how environmental and genetic factors affect the growth of organisms. (2) For Grade 8: Use data in a two-way table as evidence to support an explanation that different local environmental conditions impact growth in organisms. (3) For Grade 7 or 8: Use probability concepts and language to describe and quantify the effects that characteristic animal behaviors have on the likelihood of successful reproduction.</i></p> <p><b><u>MS-LS2 Ecosystems: Interactions, Energy, and Dynamics</u></b>  <b>As part of this work, teachers should give students opportunities to work with ratios and proportional relationships, write and solve equations, and use basic statistics:</b>  <i>Statistics and Probability (6–8.SP). Science example: For Grade 8: Use data in a two-way table as evidence to support an explanation of how social behaviors and group interactions benefit organisms' abilities to survive and reproduce.</i></p> <p><b><u>MS-LS3 Heredity: Inheritance and Variation of Traits</u></b>  <b>As part of this work, teachers should give students opportunities to use concepts of probability:</b>  <i>Statistics and Probability (6–8.SP). Science examples: (1) Recognize a Punnett square as a component of a probability model, and compute simple probabilities from the model. (2) Use a computer to simulate the variation that comes from sexual reproduction, and determine probabilities of traits from the simulation.</i></p> <p><b><u>MS-LS4 Biological Evolution: Unity and Diversity</u></b></p>	

## Green Township School District Gr. 8 Math Curriculum - July 2018

**As part of this work, teachers should give students opportunities to work with ratios and proportional relationships, use concepts of probability, and use order of magnitude thinking:**

*Ratios and Proportional Relationships (6–7.RP) and Statistics and Probability (6–8.SP).* *Science examples: (1) Apply several ratios in combination to determine a net survival rate. For example, if 50 animals in a population have trait A while 50 have trait B, and each winter the survival rates are 80% for trait A and 60% for trait B, then how many of the animals with each trait will be alive after 1 winters? How about after 2 winters? 6 winters? (2) Use scaled histograms to summarize the results of a simulation of natural selection over many generations. (3) For Grade 7 or 8: Use probability language and concepts when explaining how variation in traits among a population leads to an increase in some traits in the population and a decrease in others.*

**English-Language Arts:**

**RI.8.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.

**RI.8.5.** Analyze the structure an author uses to organize a specific paragraph in a text, including the role of particular sentences, to develop and to refine a key concept.

**RI.8.6.** Determine an author’s point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints.

**RI.8.7.** Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.

**W.8.2.** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

A. Introduce a topic and organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia).

B. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.

C. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.

D. Use precise language and domain-specific vocabulary to inform about or explain the topic.

E. Establish and maintain a formal style/academic style, approach, and form.

F. Provide a concluding statement or section that follows from and supports the information or explanation presented.

**W.8.4.** Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)

**W.8.5.** With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

**W.8.6.** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.

**W.8.7.** Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

**SL.8.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others’ ideas and expressing their own clearly.

A. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

B. Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual

## Green Township School District Gr. 8 Math Curriculum - July 2018

	<p>roles as needed.</p> <p>C. Pose questions that connect the ideas of several speakers and respond to others' questions and comments with relevant evidence, observations, and ideas.</p> <p>D. Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.</p> <p><b>SL.8.2.</b> Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.</p> <p><b>SL.8.3.</b> Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and relevance and sufficiency of the evidence and identifying when irrelevant evidence is introduced.</p> <p><b>SL.8.5.</b> Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.</p>
<p><u><b>21st Century Skills/ Career Ready Practices:</b></u></p>	<p><b>CRP1. Act as a responsible and contributing citizen and employee.</b></p> <ul style="list-style-type: none"> <li>Students will learn to work respectfully in groups within the classroom.</li> </ul> <p><b>CRP2. Apply appropriate academic and technical skills.</b></p> <ul style="list-style-type: none"> <li>Students will use technology to collect and compare data to understand concepts with scatter plots &amp; two-way tables as applied to real world situations such as in astronomy, biology, physics, finance, and population.</li> </ul> <p><b>CRP4. Communicate clearly and effectively and with reason.</b></p> <ul style="list-style-type: none"> <li>In line with the mathematical practices, students will explain and defend their reasoning when working on tasks in class and support this reasoning with evidence either verbally or in writing.</li> </ul> <p><b>CRP5. Consider the environmental, social and economic impacts of decisions.</b></p> <ul style="list-style-type: none"> <li>Through the course of real world applications and use of scatter plots and two-way tables students will have the opportunity to discuss issues related to the environment (science, biology), society (population) and economics (population, finance).</li> </ul> <p><b>CRP6. Demonstrate creativity and innovation.</b></p> <ul style="list-style-type: none"> <li>Students are encouraged to look at more than one way to solve a problem. This is evident through tasks that require the mathematical practice: modeling with mathematics.</li> </ul> <p><b>CRP7. Employ valid and reliable research strategies.</b></p> <ul style="list-style-type: none"> <li>Students will have the opportunity when exploring real world applications and resources through the Internet to question the validity of the data presented, and to use the information gathered to make decisions.</li> </ul> <p><b>CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</b></p> <ul style="list-style-type: none"> <li>Students will be prompted to explore and interpret the meaning of variables and features of scatter plots.</li> <li>Students will need to make sense of problems and persevere in constructing linear functions related to real world applications.</li> </ul> <p><b>CRP9. Model integrity, ethical leadership and effective management.</b></p> <ul style="list-style-type: none"> <li>Students will learn time management skills when given both short-term and long-term tasks to complete.</li> <li>Students will learn leadership skills when working with groups.</li> <li>Students model integrity when completing assignments independently.</li> </ul> <p><b>CRP10. Plan education and career paths aligned to personal goals.</b></p> <ul style="list-style-type: none"> <li>In this unit, various real world applications are explored which may lead to a student's interest in a particular career field.</li> </ul> <p><b>CRP11. Use technology to enhance productivity.</b></p> <ul style="list-style-type: none"> <li>Students will use technology (calculator, online resources) to understand functions and to graph the relationship between two variables.</li> </ul>

## Green Township School District Gr. 8 Math Curriculum - July 2018

	<p><b>CRP12. Work productively in teams while using cultural global competence.</b></p> <ul style="list-style-type: none"> <li>When working in groups, students will be encouraged to include all members and to encourage the contribution of all members.</li> </ul>
<a href="#"><u>2014 NJ Technology Standards:</u></a>	<p><b>8.1 Educational Technology</b> (<a href="#">Word</a>   <a href="#">PDF</a>)</p> <p>All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.</p> <ul style="list-style-type: none"> <li><b>8.1.8.A.1:</b> Students will use technology (calculator, online resources) to understand functions and to graph the relationship between two variables.</li> <li><b>8.1.8.F.1:</b> Explore a local issue, by using digital tools to collect and analyze data to identify a solution and make an informed decision.</li> </ul> <p><b>8.2 Technology Education, Engineering, Design and Computational Thinking - Programming</b> (<a href="#">Word</a>   <a href="#">PDF</a>)</p> <p>All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.</p> <p>Please see relevant projects for technology standards <a href="#">8.1</a> and <a href="#">8.2</a>:</p>

District/School Primary and Supplementary Resources	
<p><b>Primary Resource:</b></p> <p><a href="#"><u>Eureka Math (Unbound Ed - Module 6)</u></a></p>	<p><b>Supplementary Resources:</b></p> <p><i>Algebra I</i> (Glencoe 2018) <i>Ch. 4 Lessons 4-5; Ch. 10 Lessons 4-6</i></p> <p><i>Larsen Pre-Algebra</i> (Houghton Mifflin Harcourt 2012) <i>Ch 11 p. 647A &amp; B</i></p> <p><i>NJ Progress for Grade 8</i> (William H. Sadlier) Unit 3: Lessons 20-21; Unit 5: Lessons 37-40</p> <p><i>Understanding Algebra I</i> (The Critical Thinking Company)</p> <p><a href="#">Open Up Resources Online Curriculum</a></p> <p><b>Khan Academy</b></p> <p><a href="#">eMath : Unit 10 from Alg 1</a></p> <p><a href="#">Desmos: Scatter Plot Capture</a></p> <p>In this activity, students use observations about scatterplot relationships to make predictions about future points in the plot. In particular, students focus on linear vs nonlinear association, strong vs weak association, and increasing vs decreasing plots.</p> <p><b>NOTE: The Desmos activities that follow are also relevant for Unit 4.</b></p> <p><a href="#">Desmos: Polygraph Scatter Plots</a></p> <p>This Custom Polygraph is designed to spark vocabulary-rich conversations about scatter plots.</p>

## Green Township School District Gr. 8 Math Curriculum - July 2018

	<p>Key vocabulary that may appear in student questions includes: strong association, weak association, no association, positive association, negative association, linear, non-linear, increasing, and decreasing.</p> <ul style="list-style-type: none"> <li>In the early rounds of the game, students may notice graph features like strong and weak associations, even though they may not use those words to describe them. That's where you can step in. After most students have played 2-3 games, consider taking a short break to discuss strategy, highlight effective questions, and encourage students in their use of increasingly precise academic language. Then ask them to play several more games, putting that precise language to work.</li> </ul> <p><a href="#">Desmos: Card Modeling</a></p> <p>In this activity, students practice identifying the function family that will best model a given scenario. After matching scenarios with scatter plots, equations, and function types, students examine the unfortunate events that can occur when we don't match the right model to the right scenario.</p> <p><b>Performance Tasks are available for use from the following sites:</b></p> <p><a href="#">Illustrative Mathematics</a>  <a href="#">Coherence Map</a>  <a href="#">Inside Mathematics Problems of the Month</a>  <a href="#">YouCubed Tasks</a>  <a href="#">PARCC Released test items- Grade 8</a></p>
<b>Materials:</b>	<b>Suggested Workstations &amp; Activities for Use During Unit</b>
<ul style="list-style-type: none"> <li><input type="checkbox"/> <i>Graphing calculator (desmos)</i></li> <li><input type="checkbox"/> <i>Scatter plot</i></li> <li><input type="checkbox"/> <i>Two-way tables</i></li> </ul>	<b>TBD and updated as lesson planning commences</b>
<b>District/School Formative Assessment Plan</b>	<b>District/School Summative Assessment Plan</b>
<ul style="list-style-type: none"> <li>Teacher observation of students engaged in group and independent activities.</li> <li>Individual and small group conferences/interviews to assess understanding with rubric</li> <li>Self-assessment by students with guidance from teacher.</li> </ul>	<ul style="list-style-type: none"> <li>Teacher created assessments and projects</li> <li><b><i>Eureka Math</i></b> Mid- and End- Module Assessments (Constructed response item with rubric)</li> <li>Teacher/District created Quarterly Assessments</li> </ul>

## Green Township School District Gr. 8 Math Curriculum - July 2018

<ul style="list-style-type: none"> <li>• Eureka Math Sprints</li> <li>• Exit tickets</li> </ul>	
Instructional Best Practices and Exemplars	Mathematical Terms/Vocabulary
<ul style="list-style-type: none"> <li>• <i>Facilitate partner and group collaborations</i></li> <li>• <i>Inquiry based tasks introduced before direct teaching</i></li> <li>• <i>Small and large group discussions</i></li> <li>• <i>Have students use a variety of representations or methods to show and explain their understanding.</i></li> <li>• <i>Build fluency over time.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Categorical variable</b></li> <li>• <b>Intercept or Initial value</b></li> <li>• <b>Numerical variable</b></li> <li>• <b>Scatter plot</b></li> <li>• <b>Slope</b></li> <li>• <b>Association</b> An association is a relationship between two variables. The tendency for two variables to vary together in a predictable way.</li> <li>• <b>Column relative frequency</b> In a two-way table, a column relative frequency is a cell frequency divided by the column total for that cell.</li> <li>• <b>Row relative frequency</b> In a two-way table, a row relative frequency is a cell frequency divided by the row total for that cell.</li> <li>• <b>Two-way table</b> A two-way table is a table used to summarize data on two categorical variables. The rows of the table correspond to the possible categories for one of the variables, and the columns of the table correspond to the possible categories for the other variable. Entries in the cells of the table indicate the number of times that a particular category combination occurs in the data set or the frequency for that combination.</li> </ul>
Focus Mathematical Concepts	
<p><b><u>Grade Level Fluency Requirement:</u></b></p> <p>❖ <i>Concepts related to linear algebra and linear functions</i></p> <p><b><u>Mathematical Practices Applied to this Unit</u></b></p> <p><b>MP.2 Reason abstractly and quantitatively.</b> Students reason quantitatively by symbolically representing the verbal description of a relationship between two bivariate variables. They attend to the meaning of data based on the context of problems and the possible linear or nonlinear functions that explain the relationships of the variables.</p> <p><b>MP.4 Model with mathematics.</b> Students model relationships between variables using linear and nonlinear functions. They interpret models in the context of the data and reflect on whether or not the models make sense based on slopes, initial values, or the fit to the data.</p> <p><b>MP.6 Attend to precision.</b> Students evaluate functions to model a relationship between numerical variables. They evaluate the function by assessing the closeness of the data</p>	



## Green Township School District Gr. 8 Math Curriculum - July 2018

points to the line. They use care in interpreting the slope and the  $y$ -intercept in linear functions.

**MP.7 Look for and make use of structure.** Students identify pattern or structure in scatter plots. They fit lines to data displayed in a scatter plot and determine the equations of lines based on points or the slope and initial value.

### Prerequisite skills & Foundational Standards

*Refer to Achieve the Core Coherence Map for full detail on vertical and horizontal alignment to prerequisite skills & future skills.*

#### [Coherence Map](#)

#### Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

**7.EE.B.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form  $px + q = r$  and  $p(x + q) = r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*

#### Define, evaluate, and compare functions.

**8.F.A.1** Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

**8.F.A.1** Compare properties (e.g. rate of change, intercepts, domain and range) of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*

**8.F.A.3** Interpret the equation  $y = mx + b$  as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function  $A = s^2$  giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.

### Differentiation/Accommodations/Modifications

## Green Township School District Gr. 8 Math Curriculum - July 2018

### Gifted and Talented

(content, process, product and learning environment)

#### Extension Activities

- Conduct research and provide presentation of various topics.
- Design surveys to generate and analyze data to be used in discussion.
- Debate topics of interest / cultural importance.
- Authentic listening and reading sources that provide data and support for speaking and writing prompts.
- Implement RAFT Activities as they pertain to the types / modes of communication (role, audience, format, topic).
- Activities defined as “Gold” require more advanced logic and reasoning skills and will be provided as additional or replacement work on a weekly basis.
- Coordination with the G&T teacher in order to supplement the math curriculum as needed.

#### Anchor Activities

- Use of Higher Level Questioning Techniques
- Provide assessments at a higher level of thinking

### English Language Learners

#### Modifications for Classroom

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice.
- Model skills/techniques that need to be mastered.
- Extended time to complete class work
- Visual dictionaries to help build vocabulary
- Provide copy of class notes
- Pair with a peer for assistance during class

#### Modifications for Homework/Assignments

- Modified Assignments
- Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary)
- Extended time for assignment completion as needed
- Highlight key vocabulary
- Use graphic organizers

### Students with Disabilities

## Green Township School District Gr. 8 Math Curriculum - July 2018

(possible appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team)

### Modifications for Classroom

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice
- Model skills / techniques to be mastered.
- Extended time to complete class work
- Provide copy of class notes
- Preferential seating to be mutually determined by the student and teacher
- Establish expectations for correct spelling on assignments.
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests and check Google classroom for updates and assignments
- Provide regular parent/ school communication
- Teachers will check/sign student agenda daily

### Modifications for Homework and Assignments

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

### Modifications for Assessments

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests.
- Establish procedures for accommodations / modifications for assessments.

### Students at Risk of School Failure

### Modifications for Classroom

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice
- Model skills / techniques to be mastered.
- Extended time to complete class work

## Green Township School District Gr. 8 Math Curriculum - July 2018

- Provide copy of classnotes
- Preferential seating to be mutually determined by the student and teacher
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/ school communication
- Teachers will check/sign student agenda daily

### **Modifications for Homework and Assignments**

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

### **Modifications for Assessments**

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests.
- Establish procedures for accommodations / modifications for assessments.