|  |  |  |
| --- | --- | --- |
| https://onslowcounty.rubiconatlas.org/common_images/AtlasLogoDark.png?v=Atlas8.1.1.135 | Unit Planner: **LINEAR** **PATTERNS**Math 1https://onslowcounty.rubiconatlas.org/common_images/icons/collaboration.png?v=Atlas8.1.1.135Tuesday, July 7, 2015, 8:59AM | https://onslowcounty.rubiconatlas.org/images/school_logo_small.png?v=Atlas8.1.1.135 |

|  |  |
| --- | --- |
| District Wide > 2015-2016 > High School > Mathematics > Math 1 > Week 5 - Week 7 | Last Updated: Today by Mary Wible |

Sarrero, Joseph; Wible, Mary

|  |  |  |  |
| --- | --- | --- | --- |
|

|  |
| --- |
| Big Idea / Conceptual Lens  |

**PATTERNS**(constant rate of change) |

|  |
| --- |
| Focus of Study  |

Equations & inequalities with two variables.Multiple representations of equations, inequalities & functions.Modeling of quantities or relationships between two quantities.Writing explicit & recursive forms of arithmetic sequences.Interpreting parts of **linear** functions in context.Equivalent representations for equations with many variables. |
|

|  |
| --- |
| Standards and Clarifying Objectives  |

https://onslowcounty.rubiconatlas.org/common_images/icons/choose_check.png?v=Atlas8.1.1.135Choose Standards

|  |
| --- |
| ComCore: Mathematics |
| **ComCore: HS: Algebra** |
| Creating Equations |
| **HSA-CED.A. Create equations that describe numbers or relationships.** |
|  | HSA-CED.A.2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
|  | HSA-CED.A.3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.https://onslowcounty.rubiconatlas.org/common_images/icons/caret-down-darker-small.png?v=Atlas8.1.1.135Show detailsHSA-CED.A.3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.https://onslowcounty.rubiconatlas.org/common_images/icons/caret-up-darker-small.png?v=Atlas8.1.1.135Hide detailsFor example, represent inequalities describing nutritional and cost constraints on combinations of different foods. | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
| Reasoning with Equations & Inequalities |
| **HSA-REI.D. Represent and solve equations and inequalities graphically.** |
|  | HSA-REI.D.10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
|  | HSA-REI.D.12. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
| **ComCore: HS: Functions** |
| Interpreting Functions |
| **HSF-IF.A. Understand the concept of a function and use function notation.** |
|  | HSF-IF.A.1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x). | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
|  | HSF-IF.A.2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
| **HSF-IF.B. Interpret functions that arise in applications in terms of the context.** |
|  | HSF-IF.B.4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.https://onslowcounty.rubiconatlas.org/common_images/icons/caret-down-darker-small.png?v=Atlas8.1.1.135Show detailsHSF-IF.B.4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.https://onslowcounty.rubiconatlas.org/common_images/icons/caret-up-darker-small.png?v=Atlas8.1.1.135Hide detailsKey features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★ | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
|  | HSF-IF.B.5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.https://onslowcounty.rubiconatlas.org/common_images/icons/caret-down-darker-small.png?v=Atlas8.1.1.135Show detailsHSF-IF.B.5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.https://onslowcounty.rubiconatlas.org/common_images/icons/caret-up-darker-small.png?v=Atlas8.1.1.135Hide detailsFor example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.★ | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
|  | HSF-IF.B.6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
| **HSF-IF.C. Analyze functions using different representations.** |
|  | HSF-IF.C.7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
|  | HSF-IF.C.7a. Graph linear and quadratic functions and show intercepts, maxima, and minima. | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
|  | HSF-IF.C.9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).https://onslowcounty.rubiconatlas.org/common_images/icons/caret-down-darker-small.png?v=Atlas8.1.1.135Show detailsHSF-IF.C.9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).https://onslowcounty.rubiconatlas.org/common_images/icons/caret-up-darker-small.png?v=Atlas8.1.1.135Hide detailsFor example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum. | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
| Building Functions |
| **HSF-BF.A. Build a function that models a relationship between two quantities.** |
|  | HSF-BF.A.1. Write a function that describes a relationship between two quantities. | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
|  | HSF-BF.A.1a. Determine an explicit expression, a recursive process, or steps for calculation from a context. | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
|  | HSF-BF.A.2. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
| **HSF-BF.B. Build new functions from existing functions.** |
|  | HSF-BF.B.3. Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
| Linear, Quadratic, and Exponential Models |
| **HSF-LE.A. Construct and compare linear and exponential models and solve problems.** |
|  | HSF-LE.A.1. Distinguish between situations that can be modeled with linear functions and with exponential functions. | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
|  | HSF-LE.A.1a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
|  | HSF-LE.A.1b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
|  | HSF-LE.A.2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
| **HSF-LE.B. Interpret expressions for functions in terms of the situation they model.** |
|  | HSF-LE.B.5. Interpret the parameters in a linear or exponential function in terms of a context. | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |

 |

|  |
| --- |
| Enduring Understandings  |

[Bloom's Taxonomy](http://community.wvu.edu/~lsm018/Articulate%20Blooms%20Wheel/blooms_wheel.html)Students understand that...Solutions make mathematical statements true.**Linear** relationships have a constant rate of change with multiple representations (graph, table, symbolic, verbal).Equations & functions model **linear** relationships between quantities. |
|

|  |
| --- |
| Essential Concepts and Critical Content  |

**Key Words:** equation, inequality, solution, unknown, function, **linear**, constraint, viable, arithmetic, sequence, rate of change, explicit, recursive(Review: slope, intercept, maximum, minimum)**Concepts:**solution, model, function, constraint, equality, rate of change**Critical Content:**Steps to rewrite **linear** equations & inequalities.Evaluation of viability of solutions & constraints.Interpretations of word problems, tables, graphs, & equations.Creation of various representations - to include graphs, tables, explicit & recursive equations, word problems & functions.\*Weekly Learning Targets for Unit attached below.[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135Learning Targets for Linear Unit.docx](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=49943&) |

|  |
| --- |
| Processes, Strategies, and Skills  |

**8 Mathematical Practices:****MP 1 Make sense of problems, & persevere.****MP 2 Reasoning abstractly & quantitatively.*****MP 3 Critiquing reasoning of others & justifying own work.*****MP 4 Model with mathematics.****MP 5 Use tools of appropriately.****MP 6 Attend to precision.****MP 7 Seeing Structure.****MP 8 Seeing regularity in repeated reasoning & patterns.****Process#1: (connects to MP 1,2,4,6,7,8)**Analyzing a prompt.**Strategies:**Identifying key words in context.Recognizing format of information.Creating a visual representation if none is given.**Skills**:Identify intercepts, rate of change from tables, graphs, equations and word problems.Create tables, graphs, and equations from word problems.Interpret tables, graphs, and equations.**Process #2: (connects to MP 1,2,3,6,7)**Explain reasoning and justify mathematical choices.**Strategies:**Identify what information is required.Create a plan to present information verbally or visually in a logical fashion.**Skills:**Use content specific vocabulary.Use transitional phrases.Show work to reflect the use of mathematical properties & structure.Compare result to constraints & conditions of problem.**Process #3: (connects to MP4,5,8)**Create & move between representations.**Strategies:**Identifying key features & key terms.Create frayer model or similar graphic organizer to show different representations of same features.**Skills:**Read table to find **pattern** of rate of change & intercepts.Read graphs to find rates of change & intercepts.Interpret coefficients & constants of equations in context of word problem. |
|

|  |
| --- |
| Essential Questions  |

**Factual**1. How do I represent the solutions of bivariate **linear** equations & inequalities?1 What are the similarities & differences between bivariate **linear** equations & **linear** inequalities?2 How can I model a **linear** relationship?2 How are the key features of various **linear** models identified & interpreted?3 How do I create bivariate **linear** equations & inequalities to model situations?3 How do I write bivariate **linear** inequalities to model maximizing & minimizing situations?3 What is a constraint?**Conceptual**1 What is a solution?1 How many solutions could there be for a **linear** relationship?1 When is a solution viable in context?1 Why are variables sometimes used to represent coefficients?2 What are the similarities & differences between equations and functions?2 How are tables, graphs, and other representations of **linear** functions and arithmetic sequences related to each other?3 What makes a piece of information in a situation "unknown"?3 What is the importance of constraints in a **linear** relationship?3 How does changing one condition in a relationship impact the **linear** models?**Provocative**1 What conditions impact the type and number of possible solutions?1 Why are some solutions mathematically correct yet not feasible in context?2 Is there more than one way to write a **linear** model for a situation?2 When is one representation of a **linear** model more appropriate than another?3 Are there other **patterns** for data (in addition to **linear**)?3 Does every relationship have a **pattern**?3 How does the ability to predictions from data impact real world decisions? |

|  |
| --- |
| Resources/Materials  |

Resources listed below:#1 **Identifying & interpreting Rate of Change** from Growth Charts. Includes opportunity to incorporate reading information in text & from chart.#2 **Interpreting functions in multiple formats from context**. Speeding Ticket Lesson Set leads students through applications of **linear** relationships between speeding fines & speeds.#3 **Finding & interpreting intercepts in context** Balloon fundraiser**.** Heavily scaffolded lesson to find & interpret x and y-intercepts in context, from equation & graph.#4 **Graphing inequalities** MATHSHELL lesson. Includes pre-assmt, activity, & post assmt suggestions as well as suggestions for guiding questions. Students graph several inequalities on one grid to find "hidden" point. Could also be used with systems of inequalities.#5 **Building & comparing functions** Digital Downloads. Investigation which challenges students to create, interpret & compare tables, graphs, and functions from context.#6 & 7 **Conceptualizing & Representing linear relationships** Reginas Logos Attachment #6- Students must match table, graph, diagram, and recursive formula & then generate explicit formula. Can be done as small group task. Attachment #7 is a one page worksheet that presents the same diagrams but requires students to create other representations.#8 **Vertical Translations** Worksheet Problems requiring students to identify "k" from transformations.#9 Vertical & Horizontal Translations Investigation Students create tables & graphs from equations written in function notation f(x); g(x)= f(x) + k, and h(x) = f(x + k)#10 Very good website for common core aligned lessons. Take caution to cross-check with NC Math 1 standards! These materials are for NY Algebra 1 standards & therefore require some modification or thoughtful selection.\*Also see the foldables at the bottom of the page under Differentiation and **Linear** Functions Menu task under Assessment.[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135GrowthRate-AS-HeightAgeChart.pdf](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=49958&)[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135Speeding Ticket Investigation Packet update.pdf](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=49954&)[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135Finding & inter Intercepts of a Graph Activity.pdf](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=49959&)[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135defining\_regions\_using\_inequalities\_MATHSHELL.pdf](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=49960&)[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135digital downloads.docx](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=49987&)[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135Regina's Logos Update.docx](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=50281&)[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135Reginas\_Logo.pdf](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=50282&)[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135Linear Transformations EOC Practice.docx](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=50284&)[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135InvestigTransf of linear.docx](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=50285&)[https://onslowcounty.rubiconatlas.org/common_images/icons/web.png?v=Atlas8.1.1.135https://www.engageny.org/resource/high-school-algebra-i](https://www.engageny.org/resource/high-school-algebra-i) |
|

|  |
| --- |
| Formative, Interim, and Summative Assessments  |

Add New Assessment

|  |  |
| --- | --- |
|   | Everything You Wanted to Know About...Pre Assessment: Other: Teacher/Student InteractionStudents are presented with the graph of a line and are given 3 minutes to brainstorm information about the line from that graph.Can be followed with brief class discussion.[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135everything you want to know.docx](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=49993&SourceSiteID=3005&)https://onslowcounty.rubiconatlas.org/common_images/icons/caret-down-darker-small.png?v=Atlas8.1.1.1352 Standards Assessedhttps://onslowcounty.rubiconatlas.org/common_images/icons/caret-up-darker-small.png?v=Atlas8.1.1.135Hide Standards* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSA-REI.D.10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-IF.B.4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.
 |
|   | QUICK WRITE - solutionsFormative: Written: Quick WriteStudents read a graph & defend a claim related to the solutions of the line shown.[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135QUICK WRITE solutions.docx](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=50020&SourceSiteID=3005&)https://onslowcounty.rubiconatlas.org/common_images/icons/caret-down-darker-small.png?v=Atlas8.1.1.1351 Standard Assessedhttps://onslowcounty.rubiconatlas.org/common_images/icons/caret-up-darker-small.png?v=Atlas8.1.1.135Hide Standards* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSA-REI.D.10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
 |
|   | Linear Functions Menu AssmtFormative: Performance: Skill DemonstrationMenu Task allows students to choose from a "menu" of functions to construct & model.[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135LINEAR FUNCTIONS MENU ASSESSMENT.docx](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=50014&SourceSiteID=3005&)https://onslowcounty.rubiconatlas.org/common_images/icons/caret-down-darker-small.png?v=Atlas8.1.1.1353 Standards Assessedhttps://onslowcounty.rubiconatlas.org/common_images/icons/caret-up-darker-small.png?v=Atlas8.1.1.135Hide Standards* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-BF.A.1. Write a function that describes a relationship between two quantities.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-LE.A.2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-LE.B.5. Interpret the parameters in a linear or exponential function in terms of a context.
 |
|   | Toothpick Triangles PaperSlidesSummative: Performance: Authentic TaskStudents view brief Dan Meyer's video on toothpick triangle patterns & must create multiple representations for the patterns the see.Students present their work digitally using PaperSlides video. Option to extend to peer review & assessment using QR codes or other digital tool.[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135Toothpick Triangles - Perf Assmt.docx](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=50004&SourceSiteID=3005&)https://onslowcounty.rubiconatlas.org/common_images/icons/caret-down-darker-small.png?v=Atlas8.1.1.1355 Standards Assessedhttps://onslowcounty.rubiconatlas.org/common_images/icons/caret-up-darker-small.png?v=Atlas8.1.1.135Hide Standards* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-IF.B.4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-BF.A.1. Write a function that describes a relationship between two quantities.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-BF.A.1a. Determine an explicit expression, a recursive process, or steps for calculation from a context.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-LE.A.1b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-LE.A.2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
 |
|   | UNIT TEST - Part ASummative: Test: Post Test20 Questions multiple choice & free response aligned to standards for the first part of instruction in the 3 week unit.[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135Math 1 UNIT TEST part A.docx](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=49949&SourceSiteID=3005&)https://onslowcounty.rubiconatlas.org/common_images/icons/caret-down-darker-small.png?v=Atlas8.1.1.13514 Standards Assessedhttps://onslowcounty.rubiconatlas.org/common_images/icons/caret-up-darker-small.png?v=Atlas8.1.1.135Hide Standards* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSA-CED.A.2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSA-CED.A.3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSA-REI.D.10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSA-REI.D.12. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-IF.B.4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-IF.B.6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-IF.C.7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-IF.C.7a. Graph linear and quadratic functions and show intercepts, maxima, and minima.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-IF.C.9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-LE.A.1. Distinguish between situations that can be modeled with linear functions and with exponential functions.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-LE.A.1a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-LE.A.1b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-LE.A.2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-LE.B.5. Interpret the parameters in a linear or exponential function in terms of a context.
 |
|   | UNIT TEST - Part BSummative: Test: Post Test20 Questions multiple choice, free response & one written prompt aligned to standards for the last part of the linear unit.[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135Math 1 UNIT TEST part B.docx](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=50283&SourceSiteID=3005&)https://onslowcounty.rubiconatlas.org/common_images/icons/caret-down-darker-small.png?v=Atlas8.1.1.1358 Standards Assessedhttps://onslowcounty.rubiconatlas.org/common_images/icons/caret-up-darker-small.png?v=Atlas8.1.1.135Hide Standards* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-IF.A.1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-IF.A.2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-IF.B.5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-BF.A.1. Write a function that describes a relationship between two quantities.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-BF.A.1a. Determine an explicit expression, a recursive process, or steps for calculation from a context.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-BF.A.2. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-BF.B.3. Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.
* https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135HSF-LE.A.2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
 |

6 record(s) found. |
|

|  |
| --- |
| Integration Opportunities (Optional)  |

https://onslowcounty.rubiconatlas.org/common_images/icons/choose_check.png?v=Atlas8.1.1.135Choose Standards

|  |
| --- |
| P21: 21st Century Student Outcomes |
| **P21: K-12** |
| Learning & Innovation Skills |
| **Critical Thinking and Problem Solving Reason Effectively****https://onslowcounty.rubiconatlas.org/common_images/icons/caret-down-darker-small.png?v=Atlas8.1.1.135Show details****Critical Thinking and Problem Solving Reason Effectively****https://onslowcounty.rubiconatlas.org/common_images/icons/caret-up-darker-small.png?v=Atlas8.1.1.135Hide details****Learning and innovation skills increasingly are being recognized as those that separate students who are prepared for a more and more complex life and work environments in the 21st century, and those who are not. A focus on creativity, critical thinking, communication and collaboration is essential to prepare students for the future.** |
|  | Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
| **Make Judgements and Decisions****https://onslowcounty.rubiconatlas.org/common_images/icons/caret-down-darker-small.png?v=Atlas8.1.1.135Show details****Make Judgements and Decisions****https://onslowcounty.rubiconatlas.org/common_images/icons/caret-up-darker-small.png?v=Atlas8.1.1.135Hide details****Learning and innovation skills increasingly are being recognized as those that separate students who are prepared for a more and more complex life and work environments in the 21st century, and those who are not. A focus on creativity, critical thinking, communication and collaboration is essential to prepare students for the future.** |
|  | Synthesize and make connections between information and arguments | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
| **Collaborate with Others****https://onslowcounty.rubiconatlas.org/common_images/icons/caret-down-darker-small.png?v=Atlas8.1.1.135Show details****Collaborate with Others****https://onslowcounty.rubiconatlas.org/common_images/icons/caret-up-darker-small.png?v=Atlas8.1.1.135Hide details****Learning and innovation skills increasingly are being recognized as those that separate students who are prepared for a more and more complex life and work environments in the 21st century, and those who are not. A focus on creativity, critical thinking, communication and collaboration is essential to prepare students for the future.** |
|  | Assume shared responsibility for collaborative work, and value the individual contributions made by each team member | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
| Life & Career Skills |
| **Be Flexible****https://onslowcounty.rubiconatlas.org/common_images/icons/caret-down-darker-small.png?v=Atlas8.1.1.135Show details****Be Flexible****https://onslowcounty.rubiconatlas.org/common_images/icons/caret-up-darker-small.png?v=Atlas8.1.1.135Hide details****Today’s life and work environments require far more than thinking skills and content knowledge. The ability to navigate the complex life and work environments in the globally competitive information age requires students to pay rigorous attention to developing adequate life and career skills.** |
|  | Deal positively with praise, setbacks and criticism | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
| **Work Independently****https://onslowcounty.rubiconatlas.org/common_images/icons/caret-down-darker-small.png?v=Atlas8.1.1.135Show details****Work Independently****https://onslowcounty.rubiconatlas.org/common_images/icons/caret-up-darker-small.png?v=Atlas8.1.1.135Hide details****Today’s life and work environments require far more than thinking skills and content knowledge. The ability to navigate the complex life and work environments in the globally competitive information age requires students to pay rigorous attention to developing adequate life and career skills.** |
|  | Monitor, define, prioritize and complete tasks without direct oversight | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
| **Be Self-directed Learners****https://onslowcounty.rubiconatlas.org/common_images/icons/caret-down-darker-small.png?v=Atlas8.1.1.135Show details****Be Self-directed Learners****https://onslowcounty.rubiconatlas.org/common_images/icons/caret-up-darker-small.png?v=Atlas8.1.1.135Hide details****Today’s life and work environments require far more than thinking skills and content knowledge. The ability to navigate the complex life and work environments in the globally competitive information age requires students to pay rigorous attention to developing adequate life and career skills.** |
|  | Reflect critically on past experiences in order to inform future progress | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |
| **Social and Cross-Cultural Skills Interact Effectively with Others****https://onslowcounty.rubiconatlas.org/common_images/icons/caret-down-darker-small.png?v=Atlas8.1.1.135Show details****Social and Cross-Cultural Skills Interact Effectively with Others****https://onslowcounty.rubiconatlas.org/common_images/icons/caret-up-darker-small.png?v=Atlas8.1.1.135Hide details****Today’s life and work environments require far more than thinking skills and content knowledge. The ability to navigate the complex life and work environments in the globally competitive information age requires students to pay rigorous attention to developing adequate life and career skills.** |
|  | Know when it is appropriate to listen and when to speak | https://onslowcounty.rubiconatlas.org/common_images/icons/remove_805.png?v=Atlas8.1.1.135 |

 |

|  |
| --- |
| Additional Integration Opportunities (Optional)  |

**READING**:Students will use critical reading strategies listed in processes when analyzing prompts such as Digital Downloads, and Growth Rate as well as test prompts.**WRITING**:Students will use mathematically precise vocab to create written arguments and explanations in tasks such as Quick Write.**SPEAKING & LISTENING**:Students will critique reasoning of others & share their own reasoning using mathematically precise vocabulary, appropriate expressions of agreement/disagreement.(Everything You Want to Know & Toothpick Triangles)**TECHNOLOGY:**Students will use digital tools to create work product for the Toothpick assessment & viewing videos. |
|

|  |
| --- |
| Character Qualities (Optional)  |

|  |  |
| --- | --- |
| * Self-discipline
* Responsibility
* Integrity
* Cooperation
 | Continue to model & develop these character traits throughout the first grading period. It is particularly important to model, remind, reinforce expected behavior for investigations & performance tasks. |

 |

|  |
| --- |
| Differentiation/Intervention Focus Areas (Optional  |

Visual aids support students who need more structure & also appeal to students with visual learning preferences.The Foldables consolidate information about the different forms of **linear** equations. This is a review of information from 8th grade math that many students need to revisit.The UNIT Graphic Organizer helps make the connections between concepts & topics clear to the students.\*Also refer to the **Linear** Functions Menu Task for a Differentiated Assessment.[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135FOLDABLE - Different Forms of Linear Functions.pptx](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=50023&)[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135FOLDABLE - eq of lines.docx](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=50026&)[https://onslowcounty.rubiconatlas.org/common_images/icons/link.png?v=Atlas8.1.1.135GRAPHIC\_ORGANIZER\_LINEAR\_FUNCTIONS\_UNIT.docx](https://onslowcounty.rubiconatlas.org/Atlas/View/File?AttachmentID=50277&) |

<< Previous Year

Atlas Version 8.1.1

© [Rubicon International](http://www.rubicon.com/) 2015. All rights reserved