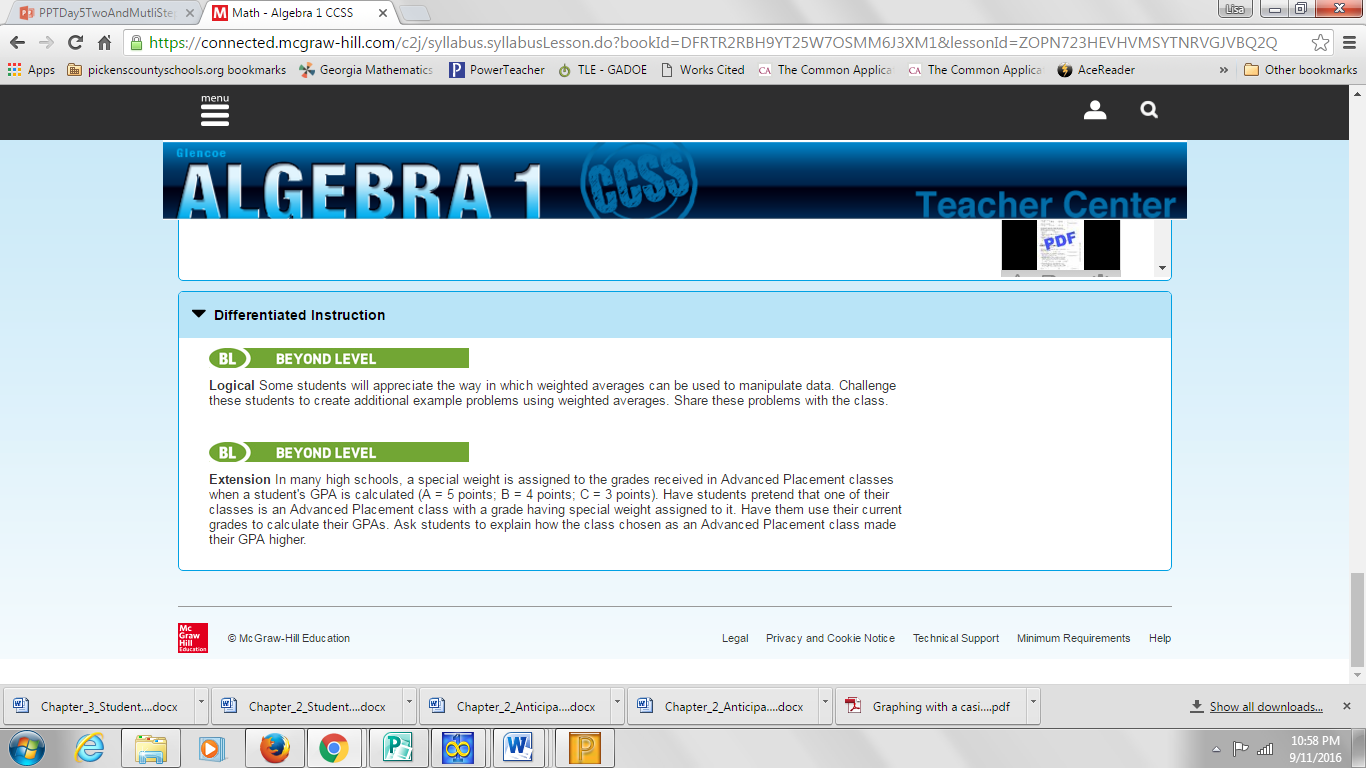
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| --- | --- | --- | --- | --- | --- |
| **Grade Level** 9th  Algebra I | | **Teacher/Room**: LPAYNE/181 Week of: September 12-16 | | | |
| **Unit Vocabulary: SEE ATTACHED** | | | | | |
| **Instructional Strategies Used: Direct instruction, activities** | | | | | |
| **Day 1** | **Day 2** | | **Day 3** | **Day 4** | **Day 5** |
| **GSE/GPS Standard(s)**:   |  |  | | --- | --- | | **A.REI.1** | Explain each step in solving  a simple equation as following  from the equality of numbers  asserted at the previous step,  starting from the assumption  that the original equation has  a solution. Construct a viable  argument to justify a solution method. | | **A.REI.3** | Solve linear equations and inequalities  in one variable, including equations  with coefficients represented by letters. |   **Mathematical Practices**  **1** Make sense of problems and persevere in solving them.  **4** Model with mathematics. | **GSE/GPS Standard(s)**:   |  |  | | --- | --- | | **F.IF.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. | | **F.IF.7a** | Graph linear and quadratic  functions and show  intercepts, maxima, and  minima. |   **Mathematical Practices**  **8** Look for and express regularity in repeated reasoning | | **GSE/GPS Standard(s)**:   |  |  | | --- | --- | | **A.REI.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). | | **F.IF.7a** | Graph linear and quadratic  functions and show  intercepts, maxima,  and minima. |   **Mathematical Practices**  **4** Model with mathematics. | **GSE/GPS Standard(s)**:   |  |  | | --- | --- | | **F.IF.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. | | **F.LE.1a** | Prove that linear  functions grow by equal  differences over equal  intervals, and that  exponential functions  grow by equal factors  over equal intervals. |   **Mathematical Practices**  **2** Reason abstractly and quantitatively. | **GSE/GPS Standard(s)**:  Review all weeks standards |
| **EQ Question:** How can the student Solve mixture problems?How can the student solve uniform motion problems? | **EQ Question:** Can the studentIdentify linear equations, intercepts, and zeros and Graph linear equations? | | **EQ Question:** can the student solve linear equations by graphing and estimate solutions to a linear equation by graphing? | **EQ Question:** Can the student use rate of change to solve problems and find the slope of a line. | **EQ Question:** Can the student solve mixture, uniform problems, identify characteristics of linear equations and graph linear equations? |
| **Mini Lesson:**  Warm-up questions from 2.8  **Activating Strategies:**  Powerpoint  **Lesson:** 2.9 weighted averages  Weekly assignment  **Resource/Materials:**  Text, powerpoint, examples, | **Mini Lesson:**  Warm up questions from 2.9  **Activating Strategies:**  **Powerpoint and notes**  **Lesson:** 3.1 graphing linear equations, 3.2 Solving linear equations by graphing  **Resource/Materials:**  Text, powerpoint, graph paper, graphing calculator, | | **Mini Lesson:**  Check homework  **Activating Strategies:**  Graphing linear equations  **Lesson:** 3.2 technology lab  **Resource/Materials:**  Text, powerpoint, calculator | **Mini Lesson:**  Check homework  **Activating Strategies:**  Activity 3.3  **Lesson:** 3.3 rate of change  **Resource/Materials:**  Text, activity , 5 books, ruler, graph paper, spaghetti, tape, | **Mini Lesson:**  Check homework  **Activating Strategies:**  Students ask teacher questions  **Lesson:** Test  **Resource/Materials:**  Test, graph paper, calculator, ruler, |
| **Differentiation:**  *Content/Process/Product:*  *Grouping Strategy: groups of 3*  *Assessment:* Have students tell what mathematical procedures they would use to solve Exercise 7. | **Differentiation**: groups of 3  *Assessment:* Make several copies of five different linear equations. Give one equation to each student. As students leave the room, ask them to identify the x- and y-intercepts. | | **Differentiation:**  *Content/Process/Product:*  *Grouping Strategy:*  *Assessment:* Ask students to write how yesterday's lesson on graphing linear equations helped them with today's new material. | **Differentiation:**  *Content/Process/Product:*  *Grouping Strategy:*  *Assessment:* Use Exercise 4 to assess whether students comprehend how to find slope from a coordinate graph. | **Differentiation:**  *Content/Process/Product:*  *Grouping Strategy:*  *Assessment:* Make several copies of five different lines graphed on a coordinate plane. Give one graph to each student. As the students leave the room, ask them to tell you the slopes of the lines they possess. |
| **Assessment :**  *Pre-Test:*  *Post-Test:*  *Formative:*  *Summative:*  *Performance Based:* | **Assessment:**  *Pre-Test:*  *Post-Test:*  *Formative:*  *Summative:*  *Performance Based****:*** | | **Assessment:**  *Pre-Test:*  *Post-Test:*  *Formative:*  *Summative:*  *Performance Based:* | **Assessment:**  *Pre-Test:*  *Post-Test:*  *Formative:*  *Summative:*  *Performance Based:* | **Assessment:**  *Pre-Test:*  *Post-Test:*  *Formative:*  *Summative:*  *Performance Based:* |
| **Homework:**  section 2.9, 7–13 odd,  16–23, 26–47 | **Homework: 3.1,** 13–49 odd, 42, 50, 51–57 odd, 58, 60–77 | | **Homework: 3.2,** 11–43 odd, 36, 44–46, 48–67 | **Homework: 3.3** 15–39 odd, 40–49, 51–68  Review WS | **Homework:**  None |

Resources and Reflective Notes:

Monday:



**Focus on Mathematical Content**

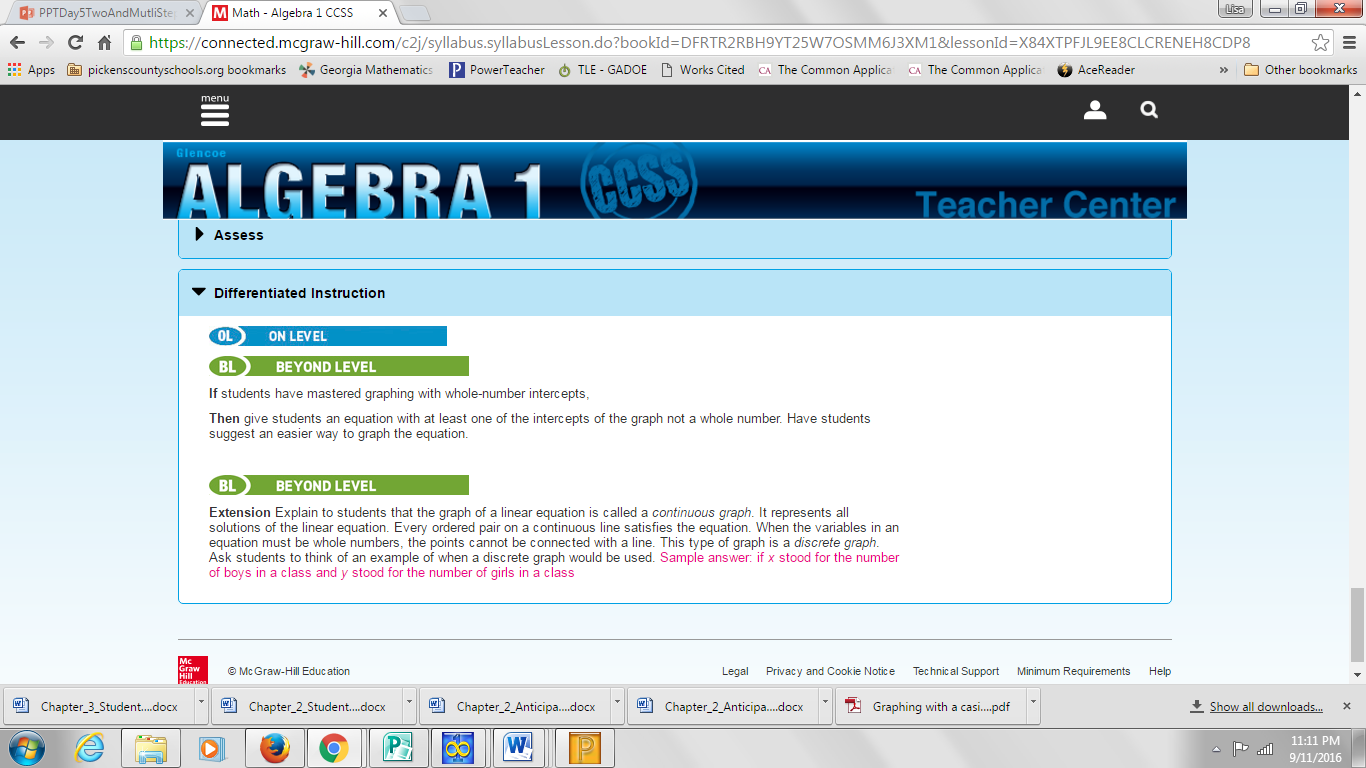
A *weighted average* is the sum of the product of the number of units in a set of data and the value per unit divided by the sum of the number of units. Mixture and uniform motion (rate) problems are applications of weighted averages.

**Uniform Motion** If an object moves without changing its speed, it is said to be in uniform motion. Uniform motion problems are solved using this formula:

Distance = rate × time

*d* = *r* × *t*

Tuesday:



**Focus on Mathematical Content**

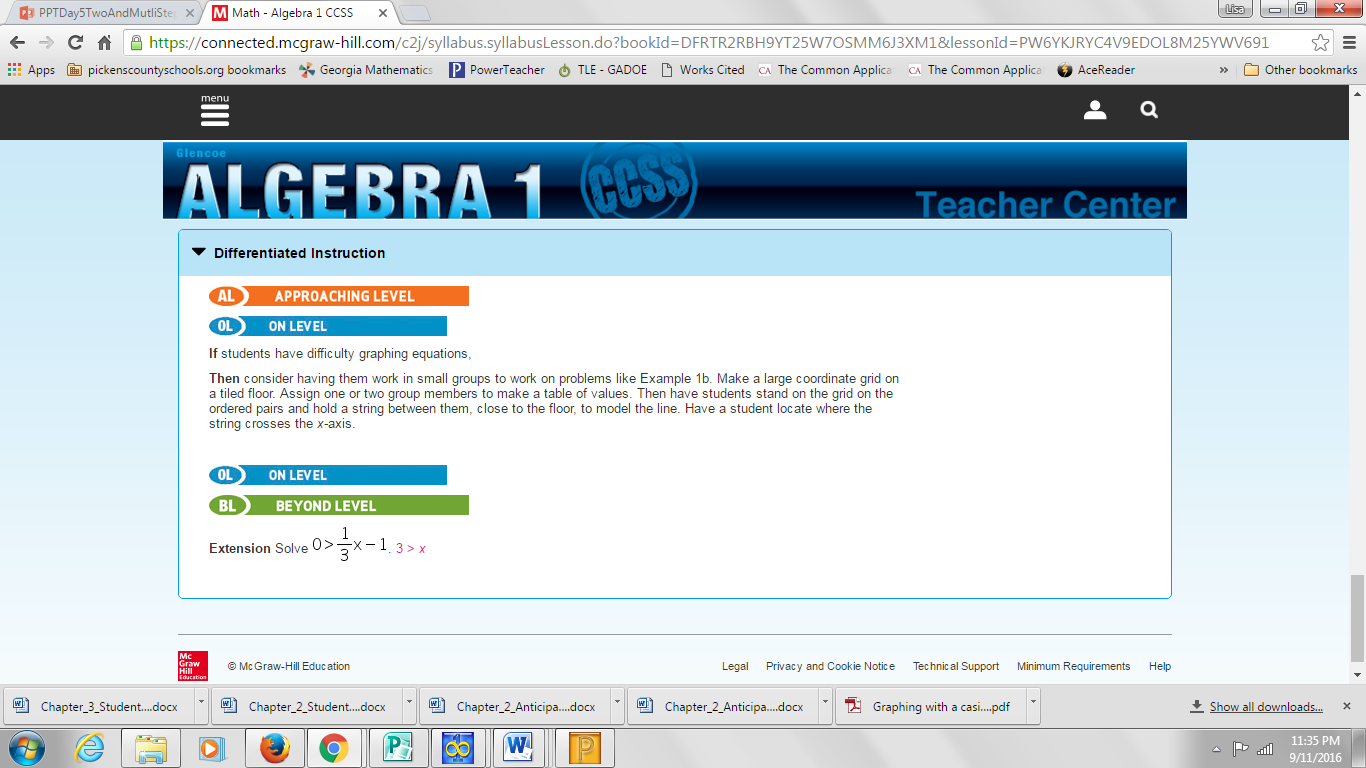
Linear equations can be written in the form *Ax* + *By* = *C*, the standard form of a linear equation. An equation is linear if the Properties of Equality can be applied to rewrite it in standard form. The graph of a linear function has at most one *x*-intercept (where the graph crosses the *x*-axis) and one *y*-intercept (where the graph crosses the *y*-axis). The intercepts can be found by alternately replacing *x* and *y* with 0. If these two points are graphed and then a line that connects them is drawn, all of the ordered pairs that lie on the line are solutions of the equation. Values of *x* for which *y* = 0 are called zeros. A zero is an *x*-intercept.

**Linear Equations** The standard form of a linear equation is *Ax* + *By* = *C*. If the properties of equality can be applied to an equation to rewrite it in standard form, then the equation is linear.

**WatchOut!**

**Standard Form**Students may assume that the standard form implies that linear equations must have positive coefficients on x and y. Point out that there are no restrictions on the value of B. This means that B could be negative. So, an equation like 3x − 4y = 7 is a linear equation.

Wednesday:



**Focus on Mathematical Content**

The solution or root of an equation is any value that makes the equation true. A linear equation has none or one root. The root of a linear equation can be found by graphing the equation's related function.

* To find the related function, get all nonzero terms on one side of the equation and 0 on the other side. Then replace 0 with *f*(*x*). For example, for 3*x* + 4 = 0, the related function is 3*x* + 4 =*f*(*x*).
* To graph the function, make a table of values.
* When the graph is a line (horizontal) that does not intersect the x-axis, there is no solution.
* When the graph is a line that intersects the *x*-axis, there is one solution, the value of the *x*-intercept. This value is also called the zero of the function.
* When the *x*-intercept is not a whole number, an estimate can be made and checked using algebra.

**Identity Equations** A linear equation in one variable has at most one root. There are equations with one variable that have infinitely many roots, but they are not linear equations. For example, 2*x* − 8 = 2(*x* − 4) when simplified becomes 2*x* − 8 = 2*x* − 8 or 0 = 0. This means any value chosen for *x* is a solution.

Thursday:

**Working in Cooperative Groups**

Put students in groups of three or four, mixing abilities. Have groups complete the Activity and Exercise 1.

**Ask:**

* Which measurement, rise or run, changes as you move the books? run
* In Step 2, which measurement changes when you add books? rise

**Practice** Have students complete Exercises 2 and 3.

**From Concrete to Abstract**

Give students a piece of uncooked spaghetti and a coordinate grid. Have them place the spaghetti on the grid and record the slope of the represented line. Repeat this activity five times.

**Extending the Concept**

**Ask:**

* If the run is not zero, is the «math xmlns=¨http://www.w3.org/1998/Math/MathML¨»«mfrac»«mi»rise«/mi»«mi»run«/mi»«/mfrac»«/math» always a fraction? «math xmlns=¨http://www.w3.org/1998/Math/MathML¨»«mfrac»«mi»rise«/mi»«mi»run«/mi»«/mfrac»«/math» can always be expressed as a fraction, even if it appears to be an integer.
* If the run is not zero, can «math xmlns=¨http://www.w3.org/1998/Math/MathML¨»«mfrac»«mi»rise«/mi»«mi»run«/mi»«/mfrac»«/math» be negative? When? Yes; the «math xmlns=¨http://www.w3.org/1998/Math/MathML¨»«mfrac»«mi»rise«/mi»«mi»run«/mi»«/mfrac»«/math» is negative when the line slopes down from left to right

Thursday and Friday:

**WatchOut!**

**Preventing Errors**As students work through Example 6, watch for those who try to find the cross product mentally and forget to multiply both r and −4 by 3.

**Scaffolding Questions**

Have students read the **Why?** section of the lesson.

**Ask:**

* How can you write the rate of change of the ride? «math xmlns=¨http://www.w3.org/1998/Math/MathML¨»«mfrac»«mrow»«mi»change«/mi»«mo»§nbsp;«/mo»«mi»in«/mi»«mo»§nbsp;«/mo»«mi»distance«/mi»«/mrow»«mrow»«mi»change«/mi»«mo»§nbsp;«/mo»«mi»in«/mi»«mo»§nbsp;«/mo»«mi»time«/mi»«/mrow»«/mfrac»«/math»
* What might the ratio be for a ride with a rate of change of 2? Sample answers: «math xmlns=¨http://www.w3.org/1998/Math/MathML¨»«mfrac»«mn»10«/mn»«mn»5«/mn»«/mfrac»«mo»,«/mo»«mo»§nbsp;«/mo»«mfrac»«mn»6«/mn»«mn»3«/mn»«/mfrac»«mo»,«/mo»«mo»§nbsp;«/mo»«mfrac»«mn»2«/mn»«mn»1«/mn»«/mfrac»«/math»
* Which has a steeper waterchute, a ride with a rate of change of «math xmlns=¨http://www.w3.org/1998/Math/MathML¨»«mfrac»«mn»1«/mn»«mn»2«/mn»«/mfrac»«/math» or a ride with a rate of change of «math xmlns=¨http://www.w3.org/1998/Math/MathML¨»«mfrac»«mn»5«/mn»«mn»2«/mn»«/mfrac»«/math»? Why? «math xmlns=¨http://www.w3.org/1998/Math/MathML¨»«mfrac»«mn»5«/mn»«mn»2«/mn»«/mfrac»«/math», because the change indistance is greater than in «math xmlns=¨http://www.w3.org/1998/Math/MathML¨»«mfrac»«mn»1«/mn»«mn»2«/mn»«/mfrac»«/math» and both have the same change in time.

**1.** **Rate of Change**

**Example 1** shows how to find the rate of change given a table of values for a real-world situation. **Example 2** shows how to describe the rate of change for a real-world problem in which the difference between two *y*-values divided by the difference between their corresponding *x*-values is not constant. **Example 3** shows how to determine whether a function is linear or nonlinear.

**2 Student-Built Glossary**

**This is an alphabetical list of the key vocabulary terms you will learn in Chapter 2. As you study the chapter, complete each term’s definition or description. Remember to add the page number where you found the term. Add these pages to your Algebra Study Notebook to review vocabulary at the end of the chapter.**

|  |  |  |
| --- | --- | --- |
| **Vocabulary Term** | **Found**  **on Page** | **Definition/Description/Example** |
| dimensional analysis  duh·MEHNCH·NUHL |  |  |
| equivalent equations  ih·KWIHV·luhnt |  |  |
| formula |  |  |
| identity |  |  |
| multi-step equation |  |  |

*(continued on the next page)*

**2 Student-Built Glossary** *(continued)*

|  |  |  |
| --- | --- | --- |
| **Vocabulary Term** | **Found**  **on Page** | **Definition/Description/Example** |
| percent of change |  |  |
| proportion  pruh·POHR·shun |  |  |
| rate |  |  |
| ratio |  |  |
| scale model |  |  |
| solve an equation |  |  |
| unit rate |  |  |
| weighted average |  |  |

**3 Student-Built Glossary**

**This is an alphabetical list of the key vocabulary terms you will learn in Chapter 3.**

**As you study the chapter, complete each term’s definition or description.**

**Remember to add the page number where you found the term. Add these pages to your Algebra Study Notebook to review vocabulary at the end of the chapter.**

|  |  |  |
| --- | --- | --- |
| **Vocabulary Term** | **Found**  **on Page** | **Definition/Description/Example** |
| arithmetic sequence |  |  |
| constant |  |  |
| constant of variation |  |  |
| direct variation |  |  |
| family of functions |  |  |
| inductive reasoning |  |  |
| linear equation |  |  |
| parent function |  |  |
| rate of change |  |  |
| root |  |  |
| slope |  |  |

**3 Student-Built Glossary** *(continued)*

|  |  |  |
| --- | --- | --- |
| **Vocabulary Term** | **Found**  **on Page** | **Definition/Description/Example** |
| standard form |  |  |
| terms |  |  |
| *x*-intercept |  |  |
| *y*-intercept |  |  |