Day	*Pages*	*Lesson Overview*	*Standards*	*Objectives (SWBA.)*	*Motivation*	*Key Terms*	*Open Ending Writing Task*
	Chapter 1	**Patterns and Multiple Representations**					
	Week 1						
1	**Introduction to Carnegie Learning Course**	During the first day of class students will be: • Enrolled • Introduced to the course materials, the syllabus, student expectations and the 60/40 split • Discuss the use of the, icons in the text, and • Provided with the parent materials				• Student text • Student Assignments • Homework Helper • Cognitive Tutor • Icons	
1	**1.6 $8 an Hour Problem** *Using Multiple Representations, Part 1* *p. 25* *Homework* *p. 11*	• Write and compare different representations to model problem situations. • Determine values for a variable from a line graph. • Write an equation. • Determine whether a given value is a solution to an equation. • Identify variable quantities.		• Investigate different representations for problem situations. • Determine values from line graphs. • Write equations. • Identify variable quantities.	This lesson is about a student's first job, the motivating questions are about students' experiences with first jobs. • Have you ever worked at a paying job? • Where did you work? • What was the hourly pay rate? • How often were you paid? • How did you like that job?	• labels • line graph • units • equation • bar graph • solution • bounds	Write a paragraph explaining how they were able to determine the amount of money earned for a given amount of time worked, as well as how they determined the amount of time worked if given the amount of earnings.

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1	**1.8 U.S. Shirts** *Using Tables, Graphs, and Equations, Part 1* *p.37* *Homework* *p. 15*	• Represent a problem situation in a sentence, using a table of values, using an equation in two variables, and using a line graph. • Determine an initial value for the number of shirts ordered if given the final result of the total cost of the order. • Write an equation in two variables. • Classify variables as dependent or independent. • Identify the advantages and disadvantages of each form of representing the problem situation: a sentence, an equation, a table of values, and a graph.		• Use different methods to represent a problem situation. • Determine an initial value when given a final result. • Identify the advantages and disadvantages of using a particular representation.	This lesson is about making custom T-Shirts, the motivating questions are about working for a custom T-Shirt Shop. Suppose your club wanted to have T-shirts printed with a design that you drew. • What work would have to be done by the T-shirt shop to set up your design to put onto T-shirts? • Would the cost for the work by the T-shirt shop to scan the design into their computer system be different if the shop was going to print 1 shirt, 10 shirts, or 100 shirts? • Why might a T-shirt shop charge for that service as a fee that is not based on the number of shirts made? • How much money do you think a T-shirt shop should charge for the set-up service? • Imagine the following situation. A club decides to have T-shirts made and goes to the T-shirt shop to set up the design and to get a price for printing the shirts. Before they have any shirts printed, they advertise the shirts at school. The principal and teachers feel that the statement on the shirts is offensive, so the group is not allowed to use that design. In that situation, why would the group still have to pay the set-up fee?	• independent variable • dependent variable	Ask the students to compare the problem situation in the Consultant's Problem in the previous lesson with the problem situation in the U.S. Shirts Problem. • How are they similar and how are they different? • How did the similarities and differences affect the different representations of the problem situations?

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2	**1.9 Hot Shirts** *Using Tables, Graphs, and Equations, Part 2* *p. 41 Homework p. 19*	• Represent a problem situation in a sentence, using a table of values, using an equation in two variables, and using a line graph. • Estimate values of expressions that involve decimal values and are otherwise difficult to calculate. • Determine an initial value for the number of shirts ordered if given the final result of the total cost of the order. • Write an equation in two variables. • Identify the advantages and disadvantages of each form of representing the problem situation: a sentence, an equation, a table of values, and a graph.		• Use different methods to represent a problem situation. • Estimate values of expressions that involve decimals. • Determine an initial value when given a final result.	This lesson is about the prices of a competitor's T-Shirt shop, the motivating questions are comparing the prices at different T-Shirt shops. • Do you think the prices are all the same at different custom T-shirt shops? • How might the prices differ between the shops? • If you were to open your own custom T-shirt business, how would you charge for the shirts that you made and sold? • How much money do you think you would make as profit for each shirt sold?	• estimation • approximate	Ask the students to write a short paragraph explaining four different ways that they can model a problem situation. Have the students explain when they would recommend that each representation be used.

Day	*Pages*	*Lesson Overview*	*Standards*	*Objectives (SWBA.)*	*Motivation*	*Key Terms*	*Open Ending Writing Task*
2	**1.10 Comparing U.S. Shirts and Hot Shirts** *Comparing Problem Situations Algebraically and Graphically* *p. 45* *Homework* *p. 21*	• Compare and analyze the U.S. Shirts and Hot Shirts Problem situations algebraically. • Create a graph with the equations for both the U.S. Shirts and the Hot Shirts situations on the same graph. • Compare and analyze the U.S. Shirts and Hot Shirts Problem situations graphically. • Write a report comparing the pricing plans for the two companies and predicting how the pricing by Hot Shirts will affect the business of U.S. Shirts.		• Compare two problem situations algebraically. • Compare two problem situations graphically.	This lesson is about writing a report for your boss, the motivating questions are about writing a report for your boss. • When would an employee be asked to write a report for his or her boss? • Why would the boss not explore the situation himself or herself? • What other type of pricing plan could exist for a custom T-shirt shop?		Question 5 of this lesson is an excellent Open-Ended Writing Task. The students are asked to analyze the problem situations and pricing in the U.S. Shirts and the Hot Shirts Problems in a report. Another writing activity for this lesson is to ask students to do the following: Propose a new pricing plan for U.S. Shirts that will make U.S. Shirts more likely to attract groups buying large quantities of shirts as well as those buying a small order of shirts. Explain how you would price your shirts and explain why you would price them that way. Would you still expect to earn a profit with your new pricing plan for U.S. Shirts?

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3	**2.4 TV News Ratings** *Ratios and Part-to-Whole Relationships* *p. 69* *Homework* *p. 29*	• Write a ratio to model the part of the population that watches Channel 11 News at 6 as compared to the whole population of people watching news. • Write an equation that models a part-to-whole relationship. • Use the equation that they wrote to solve for proportional values based on their ratio. • Make a table of values and graph the values in the table. Students are introduced to the concept of part-to-whole ratios. They will learn the concept of part-to-part ratios in Lesson 2.5.		• Use ratios to model part-to-whole relationships. • Write an equation that models a part-to-whole relationship.	This lesson is about ratios for TV news shows, the motivating questions are about the news stations that the students or their families prefer to watch. • Ask the students to list the different TV stations that their families watch for the news. You may also want to include options such as the Internet, newspapers, and radio. On the board or transparency, make a list of what the students write. • Ask the students to decide which news source is the most common for them or for their families. Then take a class survey and list the ratios for each news source that compares the number of students who chose a particular news source to the total number of students. This is a great reinforcement of the concept of surveying that was introduced in Lesson 2.1, Left-Handed Learners. • You can also talk about the fact that the survey you conducted was a convenience survey because you sampled the students who were readily available to give their opinions.	• Ratio • equation	Have students ask 40 people what type of music is their favorite, choosing from rock, rap, classical, country, jazz, hip-hop, and pop. Have the students write as many part-to-whole ratios as they can for their data. Then have them predict the percent of the population of people who prefer each type of music.

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3	**2.5 Women at a University** *Ratios, Part-to-Part Relationships, and Direct Variation* *p. 73* *Homework* *p. 31*	• Model a part-to-part relationship by writing a ratio comparing the number of female students to the total number of students at a university. • Write proportions using the part-to-part ratio and solve them to find unknown values. • Model a part-to-whole relationship by writing a ratio comparing the number of female students to the total number of students at a university. • Use ratios to solve direct variation problems. Students are introduced to part-to-part relationships.		• Use ratios to model part-to-part relationships. • Use ratios in a direct variation problem.	This lesson is about comparisons, the motivating questions are about comparisons. Students should discuss quantities that they are interested in comparing. Several suggestions are given below. **Examples of motivating comparisons:** • The number of male sports teams to the number of female sports teams available at your school. (The teacher may want to investigate these numbers in advance.) • The number of movies released that are rated PG compared to the number of movies that are rated PG-13. • The number of students who walk to school compared to the number of students who ride a bus to school.	• Ratio • constant ratio • direct variation	Have students choose two to four items of interest to them. Then have them choose a quantity for each item and list the items and their quantities. Ask the students to write every part-to-part and every part-to-whole ratio that they can create. They must label each ratio as to what they are comparing, the type of relationship, and the value.
3	**2.7 Taxes Deducted from Your Paycheck** *Percents and Taxes* *p. 87* *Homework* *p. 35*	• Calculate tax rates for given gross pay and tax deduction amounts. • Calculate the amount of tax paid for given gross pay and tax rates. • Calculate the amount of gross pay for given tax rates and amount of tax paid. • Calculate the net pay as a percent of the gross pay, given a tax rate. • Make a table of values and a graph to model the situation. • Write an equation to model net pay in terms of gross pay for a given tax rate.		• Find different tax rates. • Find amounts of gross pay. • Find amounts of paid taxes. • Write an equation that relates gross pay and net pay.	This lesson is about taxes deducted from a paycheck, the motivating questions are about taxes. **Teacher Talk:** • What percent of a typical adult's earnings is taken for taxes? • What are taxes used to pay for? • Who pays taxes?	• gross pay • tax rate • net pay	Have each student choose two lessons in this chapter. Have students write a paragraph comparing and contrasting the mathematics and the concepts in the lessons.
4	**Assessment**	•		•		•	

Day	*Pages*	*Lesson Overview*	*Standards*	*Objectives (SWBA.)*	*Motivation*	*Key Terms*	*Open Ending Writing Task*
5	**3.4 Rent a Car from Go-Go Car Rentals, Wreckem Rentals, and Good Rents Rentals** *Using Two-Step Equations, Part 1* *pp. 113* *Homework* *p. 45*	• Write and solve two-step equations for three similar car rental problem situations. • Compare prices for various mileage amounts for each of the car rental companies. • Determine the least expensive cost between the three companies for given mileage amounts. • Students continue to make connections between problem situations and multiple representations. They will write equations and compare situations algebraically as well as graphically. They will determine the most economical company for given values.		• Write and solve two-step equations. • Determine the better deal. • Compare three problem situations.	This lesson is about car rental prices, the motivating questions are about rentals. Tell the students some examples of items that are frequently rented such as cars, lawn tools, DVD players, video cameras, large screen televisions, and furniture. • What other items have you or your family members needed to rent? • How might these rental items be priced for rental? • Do all rental companies charge the same amount for the same products?	• two-step equation	**Teacher Talk:** • If you were to open a new car rental company, what would you name the company? • What would you charge as your rental cost? • Explain your prices and any special rates that you would offer.
6	**3.8 Engineering a Highway** *Using a Graph of a Two-Step Equation* *p. 143* *Homework* *p. 53*	• Model a problem situation by writing a two-step equation, making a table, and creating a graph. • Solve for the dependent and independent variables in a two-step equation. • Estimate values based on an average rate of change and by interpreting a graph. Students are introduced to the graphing of two-step equations.		• Write and use a two-step equation. • Use a graph to estimate solutions of equations.	This lesson is about becoming aware of a situation after part of the work has already been done; the motivating questions are about a similar situation. • **Teacher Talk:** Sometimes we become aware of a situation after part of the work has already been done. For instance: • You may see your friends walking by and join them 20 minutes after they started walking. • You might have been shoveling the snow from the sidewalk for 3 minutes before your sister offered to help you. • You might be making pizzas for a fundraiser for an hour before your friend arrives to help.	• estimate	Explain all of the assumptions that you made while solving the Engineering a Highway problem. Explain how reasonable each of these assumptions is and why you feel that way about each assumption.

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6	**4.1 Up, Up, and Away!** *Solving and Graphing Inequalities in One Variable* *p. 161* *Homework* *p. 57*	• Identify relationships based on inequalities. • Write and solve simple and compound inequalities symbolically. • Graph solutions of simple and compound inequalities.		• Write simple and compound inequalities. • Graph inequalities. • Solve inequalities.	This lesson is about layers of the atmosphere, the motivating questions should prepare students to answer questions based on the layers of the atmosphere. Ask the students the following questions to get them interested in the lesson. • Where is the atmosphere? • What are layers of the atmosphere? • What is Earth's atmosphere composed of?	• Inequality • Graph an inequality • Inequality symbol • Solve an inequality • Compound inequality	Have the students complete an exit slip that includes an example of a simple inequality and an example of a compound inequality. Have them write the inequalities using words and also symbolically. Then have them graph each inequality.
7	**4.2 Moving a Sand Pile** *Relations and Functions* *p. 167* *Homework* *p. 59*	Students are introduced to functions and function terminology. • Define and use formal function terminology. • Identify the input and output values for a situation. • Classify relations as functions or not functions. • Determine the appropriate domain and range of a function. • Identify the independent and dependent variables in a function. • Utilize set notation.		• Identify the inputs and outputs of relations. • Determine whether relations are functions. • Determine domains and ranges of functions. • Identify independent and dependent variables.	This lesson is about moving a sand pile; the motivating questions should allow students to become familiar with sand piles. Ask the students the following questions to get them interested in the lesson. • Have you ever seen a huge sand pile? If so, where have you seen it? • Why would we transport sand? • Why would anyone buy sand? • What are some common uses for sand?	• relation • range • input • set notation • output • independent variable • function • dependent variable • domain	Create a problem situation. Write an equation to model the situation. State the domain and range, determine whether the equation is a function, and identify the independent and dependent variables. Then, for the input value of 2, calculate the output value. (If the value 2 is not in the domain, explain why it is not a valid input value.)

Day	*Pages*	*Lesson Overview*	*Standards*	*Objectives (SWBA.)*	*Motivation*	*Key Terms*	*Open Ending Writing Task*
7	**4.3 Let's Bowl!** *Evaluating Functions, Function Notation, Domain, and Range* *p. 173* *Homework* *p. 61*	• Write and evaluate functions with a constant rate of change. • Write and apply function notation. • Determine the domain and range of functions. • Substitute values into functions. • Utilize set notation.		• Write and evaluate functions. • Write and use function notation. • Determine the domain and range of functions.	This lesson is about the cost of bowling, the motivating questions are students' experiences with bowling and the associated costs. • Who has had the opportunity to bowl within the past year? • What was the cost to rent bowling shoes? • What was the cost per game bowled? • Was the cost to bowl each game constant or did it change based on the number of games that you played?	• function • domain • function notation • range • evaluate a function	Ask the students to create a scenario for a video arcade. Have them determine the cost for admission to the arcade and the cost per play on their favorite game. They should explain the costs and write an equation in function notation for the total cost as a function of the number of games played. Then they should state the domain and range and evaluate the function for the values of 2 games, 5 games, and 10 games played.
8	**4.4 Math Magic** *The Distributive Property* *p. 177* *Homework* *p. 63*	Students are introduced to the distributive properties, factoring, and combining like terms. • Write expressions using the distributive properties of multiplication and division over addition and subtraction. • Simplify expressions using the distributive properties. • Factor expressions using the distributive properties. • Combine like terms to simplify expressions.		• Write and use distributive properties. • Use distributive properties to factor expressions. • Use distributive property to simplify expressions.	This lesson is about a student who performs calculations mentally in an efficient way; the motivating questions are about ways to solve math problems quickly. Ask the students the following questions to get them interested in the lesson. • What math tricks or shortcuts do you know and use? • How do you know if a number is divisible by 2? • How do you know if a number is a multiple of 5? • How do you know if 10 is a factor of a number?	• distributive property • simplify • factor • terms • common factor • combine like terms • greatest common factor • like terms	Have the students write a few sentences explaining each of the four distributive properties and give an example of how each can be used.

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8	**4.6 Technology Reporter** *Solving More Complicated Equations* *p. 191* *Homework* *p. 67*	• Solve equations with variable terms on both sides of the equation. • Simplify expressions to make solving equations simpler.		Solve equations with variables on both sides.	This lesson is about a technology reporter, the motivating questions are about technology reporting. You may want to bring in examples of technology reports from your local newspaper or a favorite magazine. • Have you read any technology reports in a newspaper or magazine? • About what technology would you like to read a report in the local newspaper?	• solve • simplify	If your friend was absent on the day of this lesson, he or she would need to have you explain how to solve equations using the approach you learned today in this lesson. Write an explanation of the strategy that your friend can use to solve an equation with variable terms on both sides of the equation.
9	**Assessment**	•				•	
	Chapter 5	**Writing and Graphing Linear Equations**					
10	**5.1 Widgets, Dumbbells, and Dumpsters** *Multiple Representations of Linear Functions* *p. 209* *Homework* *p. 71*	• Write linear functions for situations when given a constant slope and *y*-intercept. • Correctly use function notation. • Create tables and draw graphs of linear functions.		Represent linear functions using equations, tables, and graphs.	This lesson is about services provided by companies; the motivating questions are about the structure of companies. Explain that many companies merge and have quite diverse businesses within their company, called subsidiaries that are discussed in this lesson. An example of such a company is the Heinz Corporation® located in Pittsburgh, Pennsylvania. They merged with Del Monte®, and now make ketchup, baby food, canned vegetables, seeds, grilling sauces, and more. These divisions include Heinz Seeds®, Weight Watchers® Ore-Ida®, Del Monte®, Boston Market®, and many others. Ask the students the following questions to get them interested in the lesson. • What company do you know of that has several subsidiaries? • What are the subsidiaries that you know? • Why would a corporation have subsidiaries?	• linear equation • linear function • function notation	Ask students to create a situation that could be modeled using the function $f(x)$ 5 $25x$ 1 200. Explain the meaning of the values of –5, x, 200, and $f(x)$

Day	*Pages*	*Lesson Overview*	*Standards*	*Objectives (SWBA.)*	*Motivation*	*Key Terms*	*Open Ending Writing Task*
10	**5.2 Selling Balloons** *Finding Intercepts of a Graph* *p. 217* *Homework* *p. 73*	• Interpret the meaning of the *x*- and *y*-intercepts for a given problem situation. • Locate intercepts using the graph representing a situation. • Find intercepts algebraically.		• Interpret the meaning of intercepts in a problem situation. • Find intercepts graphically. • Find intercepts algebraically.	This lesson is about selling balloons as a fundraiser; the motivating questions are about fundraisers for schools. Ask the students the following questions to get them interested in the lesson. • Why would schools sell items to raise money? • What sports teams or clubs do you know at your schools that raise money by selling items? • What is the most successful fundraiser that you think your school has held in the past?	• *x*-intercept • *y*-intercept	Ask students to create a situation that can be modeled using a linear function. Then have them write the function algebraically, graph the function, find the *x*- and *y*-intercepts from the graph of the function, and finally verify the intercepts algebraically.
11	**5.3 Recycling and Saving** *Finding the Slope of a Line* *p. 223* *Homework* *p. 75*	• Calculate unit rates. • Extend unit rates to understand slope. • Calculate slope as a rate of change. • Determine the slope of a line through two given points.		• Find unit rates. • Describe slopes of lines. • Find rates of change. • Find slopes of lines through points.	This lesson is about rates of change in fundraising, the motivating questions are about rates of change that occur while fundraising. Ask the students the following questions to get them interested in the lesson. One fundraiser is expected to help your club earn $15 per day and another fundraiser is expected to help your club earn $528 per month. • Which fundraiser would be better to use if your club could choose only one to be used for a 30-day month? • What is the expected daily earnings for the first fundraiser? • What is the expected daily earnings for the second fundraiser?	• unit rate • run • slope • rate of change • rise	Ask the students to use the information that they learned in this lesson and previous lessons to answer the following questions using complete sentences and to explain their method of solving for the answers. • If Lili walks 2 miles in 40 minutes, what is her rate of change of distance in miles per hour? • What is her unit rate of minutes per mile? • Explain why the rate of units per mile is considered a unit rate. Is a unit rate also a rate of change?

Day	*Pages*	*Lesson Overview*	*Standards*	*Objectives (SWBA.)*	*Motivation*	*Key Terms*	*Open Ending Writing Task*
11	**5.4 Running in a Marathon** *Slope-Intercept Form* *p. 231* *Homework* *p. 77*	• Compare slopes and *y*-intercepts of lines. • Identify slopes and *y*-intercepts from equations written in slope-intercept form. • Write the equations of lines in slope-intercept form given information and from graphs. • Graph lines of equations written in slope-intercept form.		• Compare slopes and *y*-intercepts of lines. • Identify slopes and *y*-intercepts from equations. • Write equations in slope-intercept form. • Graph equations in slope-intercept form.	This lesson is about running a marathon; the motivating questions are about marathons. Ask the students the following questions to get them interested in the lesson. • What is a marathon? • How long do you suppose that most people have to train to be ready to run in a marathon? • Of what marathons have you heard? • Do you know anyone who has ever run in a marathon?	• slope-intercept form	Ask the students to summarize the method of graphing a linear equation written in slope-intercept form as if they were trying to give the directions to a robot so that the robot could graph any linear equation written in slope-intercept form.
12	**5.5 Saving Money** *Writing Equations of Lines* *p. 239* *Homework* *p. 79*	• Write the equation of a line when given a point on the line and the slope of the line. • Write the equation of a line in slope-intercept form when given a point on the line and the slope of the line. • Write the equation of lines in slope-intercept form when given two points on the line.		• Use a point and a slope to write an equation of a line in point-slope form. • Use a point and a slope to write an equation of a line in slope-intercept form. • Use two points to write an equation of a line in point-slope form and in slope-intercept form.	This lesson is about saving money; the motivating questions ask students about their experiences with saving money. Ask the students the following questions to get them interested in the lesson. • What strategies do you use to save money? • How could you save more money than you already do? • Why is it important to save money?	• slope-intercept form • point-slope form	Have the students choose a point and a slope and write the equation of the line with that slope that passes through their chosen point. Then have the students write the equation in point-slope form. Next, have the student rewrite the equation in slope-intercept form. Finally, have the students create a situation that could be modeled using their line.

Day	*Pages*	*Lesson Overview*	*Standards*	*Objectives (SWBA.)*	*Motivation*	*Key Terms*	*Open Ending Writing Task*
12	**5.7 The School Play** *Standard Form of a Linear Equation* *p. 251* *Homework* *p. 83*	• Write linear equations in standard form. • Convert equations that are written in slope- intercept form to standard form. • Convert equations that are written in standard form to slope-intercept form. • Choose appropriate values for answers by truncating solutions when appropriate.		• Write a linear equation in standard form. • Convert an equation in slope-intercept form to standard form. • Convert an equation in standard form to slope-intercept form.	This lesson is about advertising for a school play, the motivating questions are about students' involvement in a school play and advertising for school events. Ask the students the following questions to get them interested in the lesson. • Have you ever attended a school play? • If so, which play? • Have you ever been in a school play? • If so, which play? • How do you advertise for plays and other events at the school? • Have you ever made flyers to advertise an event at the school?	• slope-intercept form • standard form • point-slope form	Have the students write a short paragraph comparing and contrasting the characteristics of each of the three forms of a linear equation. Then have them write an example of a linear equation in point-slope form. Finally, have the students convert that equation to slope-intercept form and then to standard form.
13	**Assessment**	•		•		•	
	Chapter 6	**Lines of Best Fit**					
14	**6.1 Mia's Growing Like a Weed** *Drawing the Line of Best Fit* *p. 267* *Homework* *p. 87*	• Create a scatter plot for age and height, and scatter plot for age and weight. • Calculate the equation of the line of best fit for each scatter plot. • Draw the line of best fit on each scatter plot. • Make predictions for height and for weight based on age using the equation of each line of best fit.		• Create a scatter plot. • Draw a line of best fit. • Find an equation of a line of best fit. • Use a line of best fit to make predictions.	This lesson is about a child's growth rate, the motivating questions are about how children grow. Ask the students the following questions to get them interested in the lesson. • Are all children the same size, height, and weight when they are born? • What would you estimate to be a typical range of heights for healthy newborn babies? • What would you estimate to be a typical range of weights for healthy newborn babies? • Do you think that children's heights change at a constant rate? • Do you think that children's weights change at a constant rate?	• scatter plot • line of best fit • model	What other situation do you think could be modeled well using a linear equation? If you were to test your conjecture, how would you design a survey or sample that could gather data for your situation? Then, how would you check to see whether your conjecture that the situation could be modeled well with a linear equation was correct?

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15	**6.5 Human Chain: Wrist Experiment** *Using Technology to Find a Linear Regression Equation, Part 1* *p. 295* *Homework* *p. 101*	• Conduct an experiment to gather data that are very often quite linear. • Create a scatter plot of the amount of time compared to the number of people in the chain. • Use a calculator or some other technology to calculate the linear regression equation. • Predict values for time and for chain length for given values using the linear regression equation.		• Perform an experiment. • Use technology to find a linear regression equation. • Use a linear regression equation to predict results.	This lesson is about an experiment to determine the length of time for an event; the motivating questions are about calculating time. Ask the students the following questions to get them interested in the lesson. • How can we find the amount of time it takes for a trial during an experiment? • What unit for time might we use if we are timing with stopwatches? • What advantage is there to having more than one person time with a stopwatch?	• least squares method • linear regression equation • correlation coefficient	Ask the students to predict how the data and regression equation will differ when they do the human chain shoulder experiment in the next lesson.
	Chapter 7	**Systems of Equations and Inequalities**					
16	**7.1 Making and Selling Markers and T-Shirts** *Using a Graph to Solve a Linear System* *p. 319* *Homework* *p. 107*	• Compare and analyze cost and income equations graphically and algebraically. • Graph cost and income equations on the same graph. • Find a break-even point graphically.		• Analyze cost and income equations. • Graph cost and income equations on the same graph. • Find the break-even point graphically.	This lesson is about sales of markers and T-shirts, the motivating questions are about selling products. Ask the students the following questions to get them interested in the lesson. • Why would a person or company produce items to sell? • What items have you helped to sell to raise money for your teams or clubs? • What kind of T-shirts might someone buy in a large quantity and try to sell to earn a profit? • What name or names have we learned for the amount of money that is spent to produce something to sell? • What name or names have we learned for the amount of money that is received for something we sell?	• income • point of intersection • profit • break-even point	Ask the students to graph a third equation on their graph from this lesson in Problem 1 for the amount of profit for making and selling the markers and then in Problem 2 for the amount of profit for making and selling T-shirts. Have them predict what the graph of each equation will look like before they graph them. Then have them compare what they expected to what they found.

Day	*Pages*	*Lesson Overview*	*Standards*	*Objectives (SWBA.)*	*Motivation*	*Key Terms*	*Open Ending Writing Task*
17	**7.3 Hiking Trip** *Using Substitution to Solve a Linear System* *p. 335* *Homework* *p. 113*	• Write equations in standard form. • Write equations in slope-intercept form. • Use substitution to solve systems of linear equations.		Solve linear systems by using substitution.	This lesson is about a hiking trip, the motivating questions are about students' experiences with hiking. Ask the students the following questions to get them interested in the lesson. • What is a hiking trip? • What is a trail mix? • Have you ever eaten trail mix? • What was in the trail mix you have eaten? • Have you ever gone hiking? If so, where have you hiked? • Have you hiked with a group or troop?	• standard form of a linear equation • substitution method	Ask the students to write a summary of the steps needed to solve a system of linear equations using the substitution method.
17	**7.4 Basketball Tournament** *Using Linear Combinations to Solve a Linear System* *p. 343* *Homework* *p. 115*	• Write equations in standard form. • Multiply equations in systems of equations by constants to get pairs of like terms that are opposites of each other. • Use the linear combinations method to solve systems of linear equations.		Solve a linear system by using linear combinations.	This lesson is about a basketball tournament, the motivating questions are about the details of a basketball tournament. Ask the students the following questions to get them interested in the lesson. • What is a basketball tournament? • Why would tickets be sold in advance and at the door? • Have you ever played in a basketball tournament? • How did your team do? • Why might a team need to sell snacks to participate in a tournament? • Did your team sell anything to earn money to travel or pay the entrance fee for a tournament?	• standard form of a linear equation • linear combination • linear combinations method	Ask the students to write a summary of the steps to solve a system of linear equations using the linear combinations method. Students should also compare and contrast solving linear systems using the substitution method with solving linear systems using the linear combinations method.

Day	*Pages*	*Lesson Overview*	*Standards*	*Objectives (SWBA.)*	*Motivation*	*Key Terms*	*Open Ending Writing Task*
18	**7.7 Picking the Better Option** *Solving Linear Systems* *p. 359* *Homework* *p. 121*	• Write a system of linear equations to model a situation for the cost of producing bicycles under different production plans. • Solve and graph the system of linear equations. • Write and solve related systems of linear equations.		Use a system of linear equations to solve a problem.	This lesson is about designing and building a new product, the motivating questions are about their knowledge of product design and production. Ask the students the following questions to get them interested in the lesson. • When a new product is designed and created, what types of expenses would you expect to exist? • Who might pay for those expenses? • What is a prototype? • What types of products are created by first making a prototype before mass-producing the actual products? • Do you think that many changes are made after a prototype is developed and before the actual products are manufactured? • How can a company change the production costs of a product?	• break-even point	Ask the students to think of a product that could be produced for which there might be different possible production costs. Have them write a paragraph explaining two possible production plans and their associated costs. The students should write a system of linear equations to model each of the plans and then solve the system. The students should also explain the meaning of their solution. Ask the students to choose which production plan they would recommend and explain their choice.
19	**Assessment**	•				•	
	Chapter 8	**Quadratic Functions**					
20	**8.1 Website Design** *Introduction to Quadratic Functions* *p. 383* *Homework* *p. 127*	• Graph quadratic functions. • Identify the coefficients of the terms in a quadratic function and label them as *a*, *b*, and *c*. • Evaluate quadratic functions for given values.		• Graph quadratic functions. • Identify coefficients in quadratic functions. • Evaluate quadratic functions.	This lesson is about creating an animation for a website; the motivating questions are about a website design. Ask the students the following questions to get them interested in the lesson. • What is a website? • What websites have you used that were well designed? • What do you like about the website for our school? • What makes a website interesting to you?	• rate of change • quadratic function • evaluate	Ask the students to write a paragraph explaining what they learned in this lesson. Have them write the information as if they were writing a letter to a friend who had been sick and missed the entire lesson. They will try to teach the main concepts to their friend in their letter.

Day	*Pages*	*Lesson Overview*	*Standards*	*Objectives (SWBA.)*	*Motivation*	*Key Terms*	*Open Ending Writing Task*
21	**8.2 Satellite Dish** *Parabolas* *p. 393* *Homework* *p. 129*	• Graph quadratic functions. • Find the line of symmetry of a parabola graphically and algebraically. • Find the vertex of a parabola graphically and algebraically. • Identify the maximum or minimum value of a quadratic function.		• Graph quadratic functions. • Find the line of symmetry of a parabola. • Find the vertex of a parabola. • Identify the maximum or minimum value of a function.	This lesson is about the shape of a satellite dish, the motivating questions are about a satellites and satellite dishes. Ask the students the following questions to get them interested in the lesson. • What is a satellite? • How are satellites put into space? • How are satellites kept in space? • What is a satellite dish? • What is a common use for a satellite dish? • What is the shape of a satellite dish?	• parabola • vertex • line of symmetry • minimum • vertical line • maximum	Ask the students to write a paragraph summarizing the following questions. What is a parabola? What items or motions in the real world can be modeled with parabolas?
22	**8.3 Dog Run** *Comparing Linear and Quadratic Functions* *p. 401* *Homework* *p. 131*	• Create tables of values and graph linear and quadratic functions to model situations. • Identify the effects on the area of a rectangle when the length or width doubles.		• Use linear and quadratic functions to model a situation. • Determine the effect on the area of a rectangle when its length or width doubles.	This lesson is about a creating an area for a dog to run, the motivating questions are about dog runs. Ask the students the following questions to get them interested in the lesson. • What is a dog run? • What are possible ways to construct a dog run? • How could you decide what type of dog run to make if you were to make one yourself?	• linear function • quadratic function	Ask the students to write a paragraph discussing how they predict having only 8 yards of fencing available would affect the maximum possible area for the dog run. Then have them test their prediction by creating a table of values and a graph of the situation. The students should identify the maximum possible area of a dog run using only 8 yards of fencing. Finally, students should compare the actual value to their predicted value.

Day	*Pages*	*Lesson Overview*	*Standards*	*Objectives (SWBA.)*	*Motivation*	*Key Terms*	*Open Ending Writing Task*
23	**8.6 Kicking a Soccer Ball** *Using the Quadratic Formula to Solve Quadratic Equations* *p. 421* *Homework* *p. 137*	• Solve a quadratic function by using the Quadratic • Formula. • Find the value of the discriminant. • Identify the number of roots for a quadratic equation based on the sign of the discriminant.		• Solve a quadratic equation by using the Quadratic Formula. • Find the value of the discriminant.	This lesson is about the path of a kicked soccer ball, the motivating questions are about students' experiences in kicking a soccer ball. Ask the students the following questions to get them interested in the lesson. • What is the best approach to kicking a soccer ball? • What path does a kicked soccer ball usually take? • Is it better to be able to kick the ball up higher in the air or a longer distance?	• Quadratic Formula • discriminant	Ask the students to write a short paragraph explaining when they would use each of the 3 ways to solve quadratic equations.
23	**8.7 Pumpkin Catapult** *Using a Vertical Motion Model* *p. 427* *Homework* *p. 139*	• Write and use a vertical motion model to represent the height of a pumpkin as a function of time. • Write a quadratic equation to model the vertical motion to represent the height of a pumpkin as a function of horizontal distance. • Graph a vertical motion model that represents a real-life situation.		Write and use a vertical motion model.	This lesson is about a pumpkin catapult contest, the motivating questions are about unusual contests. Ask the students the following questions to get them interested in the lesson. • What is a pumpkin catapult? • This lesson is based on an unusual contest in which pumpkins are catapulted through the air. • What other unusual contests are you aware of? • Have you participated in any unusual contests?	Vertical motion model	Ask the students to write a short paragraph comparing their work in Problem 1 and in Problem 2 of this lesson. How were the problems similar and how were they different?
24	**Assessment**	•					
	Chapter 9	**Properties of Exponents**					

Day	Pages	Lesson Overview	Standards	Objectives (SWBA.)	Motivation	Key Terms	Open Ending Writing Task
25	**9.2 Bits and Bytes** *Multiplying and Dividing Powers* *p. 425* *Homework* *p. 147*	• Work with whole numbers of large magnitude. • Write large numbers as powers of the same base. • Multiply and divide large numbers. • Develop a rule to multiply large numbers by finding the product of powers of the same base. • Develop a rule to divide large numbers by finding the quotient of powers of the same base.		• Write numbers as powers. • Multiply powers. • Divide powers.	This lesson is about the amount of space available in different forms of technology, the motivating questions are about memory space for technology. Ask the students the following questions to get them interested in the lesson. • What is memory space for technology? • What types of technology use memory space? • What units of measurement do you know of for memory? • What else do you know about memory capacity for computers and technology?	• power • product • exponent • quotient	Ask the students to restate the rule that they developed in Question 6 of Problem 1. Then ask them to write a response to the following statement, "The quotient of $\frac{2^4}{2^6}=2^{-2}$ therefore, 2^{-2} must be equal to $\frac{1}{2^2}=\frac{1}{4}$." Next, have the students predict the value of 3^{-2} and explain their prediction.
25	**9.3 As Time Goes By** *Zero and Negative Exponents* *p. 429* *Homework* *p. 149*	• Use unit analysis to find equivalent times. • Write numbers as powers. • Evaluate powers that have positive exponents, powers that have negative exponents, and powers that have an exponent of zero. • Evaluate the products and the quotients of powers with various exponents.		• Write a number as a power. • Evaluate powers with positive, negative, and zero exponents.	This lesson is about the short amount of time for computer operations, the motivating questions are about computer speeds. Ask the students the following questions to get them interested in the lesson. • How fast do computers seem to process information? • When you type information into a computer, how much time do you estimate passes between when you press the key on the keyboard and when the corresponding letter or value appears on the computer monitor? • Do most computer operations or communications seem to take more or less than one second?	• positive exponent • negative exponent • zero exponent	Ask the students to conjecture what the value of $\frac{1}{2^{-3}}$ would be. They should explain their theory in a short paragraph and also think of a way that they could test their conjecture to determine whether they are correct.

Day	*Pages*	*Lesson Overview*	*Standards*	*Objectives (SWBA.)*	*Motivation*	*Key Terms*	*Open Ending Writing Task*
26	**9.5 The Beat Goes On** *Properties of Powers* *p. 437* *Homework* *p. 153*	• Calculate the lengths of radii when given diameters. • Calculate the area of circular drumheads. • Develop and apply the power of a power property. • Develop and apply the power of a product property. • Develop and apply the power of a quotient property.		• Use the power of a power property. • Use the power of a product property. • Use the power of a quotient property.	This lesson is about the sound produced by differently sized drums, the motivating questions are about drums. Ask the students the following questions to get them interested in the lesson. • Do you play the drums? • How are drums made? • What geometric shape are most drums?	• power • product • quotient	Ask the students to write a short essay in response to the following questions. Why do we refer to a number raised to an exponent of 2 as the number "squared"? Why do we refer to a number raised to an exponent of 3 as the number "cubed"?
	Chapter 10	**Polynomial Functions and Rational Expressions**					
26	**10.2 Play Ball!** *Adding and Subtracting Polynomials* *p. 461* *Homework* *p. 161*	• Evaluate two polynomials for the same x-value, and then find the sum of the results. • Add two polynomials, and then evaluate the sum for a given value of x. • Compare the results for the two sums. • Add polynomials. • Subtract polynomials. • Simplify expressions requiring addition and subtraction of polynomials.		• Add polynomials. • Subtract polynomials.	This lesson is about attendance at baseball games, the motivating questions are about attending baseball games. Ask the students the following questions to get them interested in the lesson. • Have you attended a major league baseball game? • What stadium(s) have you attended? • What is your favorite stadium? Why? • What is the closest major league baseball stadium and team to our school? • Is that team part of the National League or the American League?	• combine like terms • add • distributive property • subtract	Have the students create two polynomials with at least 3 terms in each. Have the students write the polynomials in standard form and then find the sum and the difference of the two polynomials. Ask the students to write a few sentences to explain their opinion as to what effect the order of the two polynomials has for both the sum and for the difference. During the next class session, discuss their work and responses for this activity as a whole class.

Day	*Pages*	*Lesson Overview*	*Standards*	*Objectives (SWBA.)*	*Motivation*	*Key Terms*	*Open Ending Writing Task*
27	**10.3 Se Habla Español** *Multiplying and Dividing Polynomials* *p. 465* *Homework* *p. 163*	• Evaluate polynomials for a given value of *x* and then multiply the results. • Multiply the polynomials, then evaluate the product for the same given value of *x*. • Compare the results from each process and identify them as giving the same value. • Follow a similar procedure for division of polynomials. • Use long division to divide polynomials. • Students will identify the divisor, dividend, and remainder when dividing polynomials.		• Use an area model to multiply polynomials. • Use distributive properties to multiply polynomials. • Use long division to divide polynomials.	This lesson is about the number of students who take foreign language classes, the motivating questions are about foreign language classes. Ask the students the following questions to get them interested in the lesson. • What foreign language classes are offered at our school? • Have you ever taken a foreign language class? • What language did you study or are you studying? • How did you choose which language to study? • What other foreign language would you like our school to offer?	• area model • dividend • distributive property • remainder • divisor	Have the students write a short paragraph explaining how to multiply and how to divide polynomials. Remind them to be precise in their vocabulary. For instance, they should correctly use the words *product, quotient, divisor, dividend,* and *remainder* in their explanation. They should also include a detailed example of each.
27	**10.4 Making Stained Glass** *Multiplying Binomials* *p. 473* *Homework* *p. 165*	• Multiply binomials. • Develop patterns and formulas for multiplying binomials. • Use the FOIL Pattern to multiply binomials efficiently. • Use formulas to find the products of the most common types of special binomials.		• Use the FOIL pattern to multiply binomials. • Use formulas to find special products.	This lesson is about an artist making designs in stained glass, the motivating questions are about making stained glass. Ask the students the following questions to get them interested in the lesson. • What is stained glass? • Do you know how stained glass is made? • Where have you seen stained glass? • How difficult do you think it is to make stained glass?	• FOIL pattern • square of a binomial sum • square of a binomial difference	Have the students explain in a detailed, but short paragraph, the steps to use to multiply by using FOIL.

Day	*Pages*	*Lesson Overview*	*Standards*	*Objectives (SWBA.)*	*Motivation*	*Key Terms*	*Open Ending Writing Task*
28	**10.5 Suspension Bridges** *Factoring Polynomials* *p. 479* *Homework* *p. 167*	• Solve a quadratic equation using the quadratic formula. • Factor out a common monomial factor to solve a quadratic function. • Factor trinomials of the form $x^2 + bx + c$. • Factor trinomials of the form $ax^2 + bx + c$.		• Factor a polynomial by factoring out a common factor. • Factor a polynomial of the form $x^2 + bx + c$ • Factor a polynomial of the form $ax^2 + bx + c$	This lesson is about preparing presentations about suspension bridges; the motivating questions are about bridges. Ask the students the following questions to get them interested in the lesson. • What is a suspension bridge? • What other kinds of bridges have been constructed? • Where are the nearest bridges to our school? • What materials do you think are used to create most bridges?	• factor n trinomial • linear factor n FOIL pattern	Ask the students to respond to the following writing prompt. In Question 2 of Investigate Problem 1, you factored out common monomial factors like the 3*x* from each term of the function $\left(3x^2 - 9x\right)$. In Question 2 of Investigate Problem 2, you factored out binomial factors like (x + 3) from the trinomial $\left(x^2 + 4x + 3\right)$. How can you combine these skills to factor the polynomial $\left(2x^3 + 16x^2 + 30x\right)$?
28	**10.6 Swimming Pools** *Rational Expressions* *p. 485* *Homework* *p. 169*	• Represent a ratio as a rational function. • Determine the domains for rational expressions. • Simplify rational expressions. • Add, subtract, multiply, and divide rational expressions.		• Find the domains of rational expressions. • Simplify rational expressions. • Add, subtract, multiply, and divide rational expressions.	This lesson is about designing a swimming pool; the motivating questions are about swimming pools. Ask the students the following questions to get them interested in the lesson. • What is a custom in-ground pool? • What other kinds of pool can exist? • What shapes of in-ground pools have you seen? • Do you have a swimming pool? • Do you like to swim?	• rational expression • excluded value • domain • restricting the domain	Have the students write a short paragraph to compare and contrast operations with fractions and operations with rational expressions.
29	**Review**						
30	**Final**						