8th Grade

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Chapter 1: Analyze and Solve Linear Equations (3 weeks)

Utah Core Standard(s):

- **Solve linear equations in one variable. (8.EE.7)**
  a) Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
  b) Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Academic Vocabulary:
Linear expression, simplify, linear equation, solve, solution, like terms, distributive property, no solution, infinitely many solutions

Chapter Overview:
This chapter begins with a review of simplifying and writing expressions and then moves into solving multi-step linear equations in one variable. The chapter includes equations with one solution, no solution, and infinitely many solutions. Students use algebra tiles to model, simplify, and solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. While working with the concrete representation of an equation, students are simultaneously manipulating the symbolic representation of the equation. By the end of the chapter, students should be fluently solving multi-step equations represented symbolically. They should feel comfortable with the laws of algebra that allow them to simplify expressions and the properties of equality that allow them to transform a linear equation into its simplest form, thus revealing the solution if there is one. While solving, students will become comfortable with the inverse operations that allow them to transform a linear equation into its simplest form. An important feature of allowable operations on equations is that they can be reversed. This chapter utilizes error analysis to highlight common mistakes that are made when solving equations

In the last section of the chapter, students look at equations with infinitely many or no solutions. They analyze what it is about the structure of the equation and the solving outcome that results in one solution, infinitely many solutions, or no solution. Applications are interwoven throughout the chapter in order that students realize the power of being able to write and solve a linear equation to solve real world problems. The ability to be able to solve real world problems by writing and solving linear equations gives purpose to the skills students are learning in this chapter.

Section 1.1: Simplify and Solve Linear Equations in One Variable, Applications

Section Overview:
This section begins with a review of writing and simplifying algebraic expressions. Then students move into writing and solving linear equations in one variable. Students start with linear equations whose solutions require collecting like terms. They then move onto equations whose solution requires the use of the distributive property and collecting like terms. Following these lessons, students will write word problems to match equations and they will write equations to match word problems. The equations will be in the same form that students studied in prior lessons (those whose solutions require the use of the distributive property and collecting like terms). As students continue in this section, they will move to equations that contain variables on both sides of the equation. Finally, they will put everything together and fluently solve multi-step equations with rational coefficients and variables on both sides that require expanding expressions using the distributive property and collecting like terms. In the last lesson, students will again write word problems to match equations and they will write equations to match word problems. The equations can take on any form of equation studied in this chapter.

Concepts and Skills to Master:
By the end of this section, students should be able to:
- Understand the meaning of linear expression and linear equation.
- Simplify linear expressions, including those requiring expanding using the distributive property and collecting like terms.
- Write and simplify linear expressions that model real world problems.
- Translate between the concrete and symbolic representations of an expression and an equation.
- Solve multistep linear equations with rational coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
- Write and solve multistep linear equations that model real world problems

Section 1: Analyze And Solve Linear Equations	**Materials Needed**	**Key Ideas**	**Optional/Extra Activities**	**Noteworthy**
1.1a Classwork: Review Simplify Linear Expressions	Workbooks, Tiles	Linear Expressions, Simplified, Rational Numbers	Students write linear expressions	Notebook for critical vocabulary
1.1a Homework: Review Simplify Linear Expressions				
1.1b Anchor Problem: Chocolate Problem	Brown bags, Hershey kisses	Solutions, expressions, simplify	Variation of candy activity	
1.1c Classwork: Solve Linear Equations in One Variable (simplify by combining like terms)	Workbooks, Tiles	Linear equation, combining like terms,	Additional worksheets	
1.1c Homework: Solve Linear Equations in One Variable (simplify by combining like terms)				Homework problems could be used for quiz
1.1d Classwork: Solve Linear Equations in One Variable (simplify using distribution)	Workbooks	Distributive property, solve, solution,	Students construct their own linear equations using parentheses.	
1.1d Homework: Solve Linear Equations in One Variable (simplify using distribution)				Homework problems could be used for quiz
1.1e Classwork: Applications Part 1	Workbooks	Writing expressions	Construct word problems. Perhaps miles driven on family vacation, or money spent on food at basketball camp	
1.1e Homework: Application Part 1				

1.1f Classwork: Solve Linear Equations in One Variable (simplify with variables on both sides)	Workbooks	Variables on both sides of equation	Additional practice worksheets	
1.1f Homework: Solve Linear Equations in One Variable (simplify with variables on both sides)				Homework problems could be used for quiz
1.1g Classwork: Solve Linear Equations in one Variable (multi-step)	Workbooks, Tiles	Combining like terms,	Additional practice worksheets	
1.1g Homework: Solve Linear Equations in One Variable (multi-step)				
1.1h Classwork: Applications Part 2	Workbooks	Linear expressions, linear equations, like terms, distributive property, solve	Students construct real life word problems	
1.1h Homework: Solve Linear Equations in One Variable (multi-step)				
Section 1.2 Solve Linear Equations in One Variable (special cases)	**Material Needed**	**Key Ideas**	**Optional/Extra Activities**	**Noteworthy**
1.2a Anchor Problem: Chocolate Problem	Refer back to Anchor problem in previous section. Perhaps you use a variation of the same activity	No Solution, Infinitely many solutions		
1.2a Homework: Review of Multi-step Solving				
1.2b Classwork: Solve Linear Equations in One Variable (special cases)	Workbooks	No Solution, Infinitely many solutions	Students may provide examples of these two key ideas	Critical vocabulary

1.2b Homework: Solve Linear Equations in One Variable (special cases)				Homework problems could be used for quiz

8th Grade

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Chapter 3: Representations of a Line (4 weeks)

UTAH CORE Standard(s)

1. Use similar triangles to explain why the slope *m* is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b. (8.EE.6)

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

3. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (*x*, *y*) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. (8.F.4)

4. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change. (8.F.2)

CHAPTER OVERVIEW:

In the previous chapter, students began to surface ideas about the slope-intercept form of the equation of a line. In this chapter, students solidify their understanding of the slope-intercept form of a linear equation and identify the slope and *y*-intercept of a line in each of the representations (context, table, equation, graph, and geometric model). Students will move fluently between the representations of a linear relationship, making connections between the representations. Students explore the growth rate of a linear pattern, realizing that a linear function grows by equal differences over equal intervals. This work will set the stage for students to be able to write the equation of a line given any set of conditions. The transition from equation to relation to function is an important and difficult one, so we shall be devoting Chapter 4 specifically to helping students make the change in thinking.

VOCABULARY:

graph	table	equation	context
geometric model	constant difference	difference table	slope
unit rate	rate of change	*y*-intercept	initial value
linear	slope-intercept form	vertical	horizontal
transformation	translation	rotation	reflection
parallel	perpendicular		

Chapter 3: Representations of a Line	**Materials Needed**	**Key Ideas**	**Optional/Extra Activities**	**Noteworthy**
3.1 Represent Linear Patterns and Contexts				Connect linear patterns to tables, graphs, equations, and models.
3.1a Class Activity: Connect the Rule to the Pattern		Progressive patterns in geometric models, and unit rates.		How many different ways can you view a pattern?
3.1a Homework: Connect the Rule to the Pattern				
3.1b Class Activity: Representations of a Linear Pattern		Representing linear patterns in difference tables, graphs and equations (slope and y-intercept.		Remember rise over run for slope. How might these math concepts be useful?
3.1 b Homework: Representation of a Linear Pattern				

3.1 c Classwork: Match the Graphs with CBRs, Write Stories	CBRs, student groups (teams)	Initial value (starting point) and rate of change		Practice by making a graph and telling a friend a story and having them reproduce the graph.
3.1 c Homework: Stories and Graphs				
3.1 d Classwork: Representations of a Linear Context		Seeing patterns in a written context.		Look for scenarios where you can see patterns in your life—running times, wins, A grades, money, etc.
3.1 d Homework: Representations of a Linear Context				
3.1e Classwork: More Representations of a Linear Context				Plan a goal based upon a pattern you have seen over a couple of repeated observations.
3.1e Homework: More Representations of a Linear Context				
3.2 Graph and Write Equations of Lines	**Materials Needed**	**Key Ideas**	**Optional/Extra Activities**	**Noteworthy**
3.2a Class Activity: Write Equations in Slope Intercept Form		Using a graph to understand the slope intercept equation.		What is the difference between a graph with a slope of 3 and a slope of 1/3?
3.2a Homework: Write Equations in Slope Intercept Form				
3.2b Classwork: Graph from Slope Intercept Form		Using slope intercept form to construct a graph.		How does a negative slope affect the graph? What is the influence of a negative y-intercept?
3.2b Homework: Graph from Slope Intercept Form				
3.2c Class Activity: Graph and Write Equations for Lines		Using line characteristics to construct a graph and write the slope intercept		How did you find the y-intercept? If you decreased the y-intercept by two units—without changing

(given the slope and a point)		equation.		your slope, how would this affect your coordinates?
3.2 c Homework: Graph and Write Equations for Lines (given the slope and a point)				
3.2 d Classwork: Write Equations Lines (given two points)		Determining the slope and y-intercept with two coordinate pairs, a data-set, or a plotted line.		What are the keys behind finding equations from coordinate pairs, data-sets, and plotted lines?
3.2 d Homework: Write Equations Lines (given two points)				
3.2e Classwork: Write Equations to Solve Real-world Problems		Gleaning linear characteristics from real-world written context.		Which contextual words are linked to slope? Which words are linked to y-intercept? Initial value?
3.2e Homework: Write Equations to Solve Real-world Problems				
3.2f Class Activity: Equations for Graph Shifts		Observe how changing one linear characteristic affects the other components.		How might these math concepts be useful?
3.2f Homework: Equations for Graph Shifts				
3.3 Relate Slopes and Write Equations for Parallel and Perpendicular Lines	**Materials Needed**	**Key Ideas**	**Optional/Extra Activities**	**Noteworthy**
3.3a Class Activity: Slopes of	Graph paper (one inch grid?), 3 x 5 cards,	The relationship between the slopes of		Graph a perpendicular line to a line with a slop of 4, without

Perpendicular Lines	straight-edge, and scissors	perpendicular lines.		changing the y-intercept.
3.3a Homework: Slopes of Parallel Lines		The relationship between the slopes of parallel lines.		What is different between parallel lines, the slope or the y-intercept?
Section 3.3b Class Activity: Equations of Parallel and Perpendicular Lines		Recognizing relationships between parallel and perpendicular lines.		What is the key to making a parallel line on a graph? How do you make a perpendicular line on a graph?
3.3 b Homework: Equations of Parallel and Perpendicular Lines				
Chapter 3 Test: Representations of a Line				

8th Grade

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Chapter 4: Simultaneous Linear Equations (3 weeks)

UTAH CORE Standard(s)

Analyze and solve pairs of simultaneous linear equations. (8.EE.8)

a) Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.

b) Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.

c) Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.

CHAPTER OVERVIEW:

In this chapter we discuss intuitive, graphical, and algebraic methods of solving simultaneous linear equations; that is, finding all pairs (if any) of numbers (x, y) that are solutions of both equations. We will use these understandings and skills to solve real world problems leading to two linear equations in two variables.

VOCABULARY:

system of linear equations in two variables, simultaneous linear equations, solution, intersection, ordered pair, elimination, substitution, parallel, no solution, infinitely many solutions

Chapter 4: Simultaneous Linear Equations	Materials Needed	Key Ideas	Optional/Extra Activities	Noteworthy
4.0 Anchor Problem: Chicken and Pigs		Writing linear equations, comparing linear equations		Review the parts of y = mx + b
4.1 Understand Solutions of Simultaneous Linear Equations				
4.1a Class Activity: The Bake Sale		Creating equations from context. Solutions to systems of linear equations.		What is the solution to a system of linear equations? Where is it on a graph?
4.1b Class Activity: Who Will Win the Race?	Be prepared to have groups present how they solved the problem so that all methods may be surfaced.	Solving systems of equations using any method (equations, graphing, tables)		Record in your notebook how someone solved the problem that was different than your method.
4.1 b Homework: Who Will Win the Race?	May need graph paper depending on how they choose to solve the problems.			
4.1c Class Activity: Solving Simultaneous Linear Equations by Graphing		Rearranging a standard form equation to slope-intercept form. Three possibilities for lines intersecting. What is a solution?		How can you tell by looking at a pair of linear equations what type of solution it will have?
4.1 c Homework: Solving Simultaneous Linear Equations by Graphing				

Section 4.2: Solve Simultaneous Linear Equations Algebraically	Materials Needed	Key Ideas	Optional/Extra Activities	Noteworthy
4.2a Class Activity: Introduction to Substitution		Substitution values for shapes. Using what you know to find other pieces to the puzzle.	Discuss how substitution works in sports.	What happens when you make a substitution?
4.2a Homework: Introduction to Substitution				
4.2b Class Activity: Substitution Method for Solving Systems of Equations		Using shapes to make the process of substitution more concrete.		List the steps to solving linear equations using substitution.
4.2 b Homework: Substitution Method for Solving Systems of Equations				
4.2 c Class Activity: Elimination Method for Solving Systems of Equations		Introduction to elimination, helping students see that if the quantities are equal but opposites, the problems are easy to solve.		Why was the pizza problem easy to solve?
4.2d Class Activity: Elimination Method of Solving Linear System		Modeling using shapes to make elimination more concrete.		Pick one of the problems with shapes, convert the problem to symbols and solve.
4.2e Class Activity: Elimination Method Multiply First		Writing equations, solving equations using elimination.		List the steps to solving using elimination.
4.2e Homework: Elimination Method				

Multiply First				
4.2f Class ActivityL Solving Systems of Equations Mixed Strategies		Deciding which method is the best for solving a particular set of equations.		When is it easiest to solve a system by 1) graphing, 2) substitution, 3) elimination.
4.2f Homework: Solving Systems of Equations Using Mixed Strategies				
Section 4.3: Solve Real World Problems Using Equations	Materials Needed	Key Ideas	Optional/Extra Activities	Noteworthy
4.3a Class Activity: Revisiting Chickens and Pigs		Writing and solving linear equations to solve story problems.		Of the three methods you have learned, which is your favorite method? Least favorite? Why?
4.3a Homework: Applications of Linear Systems				
Chapter 4 Test: Simultaneous Linear Equations				

8th Grade

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Chapter 5: Functions (4 weeks)

UTAH CORE Standard(s)

Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. (8.F.1)

- Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1, 1), (2, 4) and (3, 9), which are not on a straight line. (8.F.3)
- Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. (8.F.4)
- Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change. (8.F.2)
- Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally. (8.F.5)

CHAPTER OVERVIEW:

In this chapter, the theme changes from that of solving an equation for an unknown number, to that of "function" that describes a relationship between two variables. Students have been working with many functional relationships in previous chapters; in this chapter we take the opportunity to formally define function. In a function, the emphasis is on the relationship between two varying quantities where one value (the output) depends on another value (the input). We start the chapter with an introduction to the concept of function and provide students with the opportunity to explore functional relationships algebraically, graphically, numerically in tables, and through verbal descriptions. We then

make the distinction between linear and nonlinear functions. Students analyze the characteristics of the graphs, tables, equations, and contexts of linear and nonlinear functions, solidifying the understanding that linear functions grow by equal differences over equal intervals. Finally, students use functions to model relationships between quantities that are linearly related. Students will also describe attributes of a function by analyzing a graph and create a graphical representation given the description of the relationship between two quantities.

VOCABULARY:

function, input, output, relation, mapping, independent variable, dependent variable, linear, nonlinear, increasing, decreasing, constant, discrete, continuous, intercepts

Chapter 5: Functions	Materials Needed	Key Ideas	Optional/Extra Activities	Noteworthy
5.0 Anchor Problem: The DMV		Writing linear equations, comparing linear equations		Review the parts of y = mx + b
5.1a Class Activity: Introduction to Functions		What is a function? What is not a function?		What is a function? What is not a function? Give an example of each one.
5.1a Homework: Introduction to Functions				
5.1b Class Activity: The Function Machine	Teacher will need a "function machine" to give values to students.	Input=Output for functions	There is a virtual input/output machine on the internet, just Google "function machine" and you'll find it. You can display it on your Smartboard.	What is input? What is output? Explain your method for figuring out the rule for each function.
5.1 b Homework: The Function Machine				
5.1 c Class Activity: Representations of a Function		Representing functions as tables, mappings and graphs. Is it a function, justify your reasoning.		Draw a table, mapping, and graph of a given function.
5.1 c Homework:				

Representations of a Function				
5.1 d Class Activity: Independent and Dependent Variables		Determining independent and dependent variables.	You may want to consider instead of the "I" above the independent, etc., using two different colors of colored pencils to distinguish the two.	What variable is associated with the x value? The y value?
5.1 d Homework: Independent and Dependent Variables				
Section 5.2: Explore Linear and Nonlinear Functions	Materials Needed	Key Ideas	Optional/Extra Activities	Noteworthy
5.2a Class Activity: Display Designs	Graph paper possibly for drawing the next design.	Is a function linear or not?		What makes a function linear?
5.2a Homework: More Patterns-Are They Linear?				
5.2 b Class Activity: Linear and NonLinear Functions in Context		What makes a linear function?		What makes a linear function?
5.2 b Homework: E Linear and NonLinear Functions in Context				
5.2 c Class Activity: The Handshake Problem	Be prepared to have students show their different methods of solving their problems and their justifications.	Finding patterns.		List the attributes of a proportional relationship. 1) Starts at (0, 0) and 2) linear
5.2c Homework:				

Linear and NonLinear Situations				
5.2d Class Activity: Comparing Linear and NonLinear Equations	Graphing Calculators	Parent graphs of linear and nonlinear functions, predicting which will be linear.		Make a list of attributes of linear vs nonlinear functions
5.2d Homework: Represntations of Linear and NonLinear Functions				
5.2e Class Activity: Representations of Functions		Matching stories, equations, tables and graphs.		Pick one linear example and add all 4 pieces of the function to your notebook.
5.2e Homework: Comparing Linear Functions				
Section 5.3: Model and Analyze a Functional Relationship	Materials Needed	Key Ideas	Optional/Extra Activities	Noteworthy
5.3a Class Activity: Constructing Linear Functions		Independent/dependent variables, linear or nonlinear, creating equations		How can you tell if a situation is linear? How does the pattern help you create the equation?
5.3a Homework: Constructing Linear Functions				
5.3b Class Activity: Features of Graphs	Scissors to cut apart the graphs	Discrete vs Continuous, increasing vs decreasing vs constant		Paste at least two examples of each in your notebook (Discrete, Continuous, increasing, decreasing, constant)
5.3b Homework: Features of Graphs				

5.3c Class Activity: School's Out		Use discrete, continuous, increasing, decreasing, constant to describe graphs. Creating stories to match graphs.	Students could be required to use their English vocabulary words in their stories to incorporate cross-curricular and it might make the stories a bit funny.	Use your own words to describe each of the following: discrete, continuous, increasing, decreasing, constant.
5.3c Homework: Bike Race				
5.3d Class Activity: From Graphs to Stories		Key features of graphs and writing stories for graphs.		Make a list of the attributes of both proportional and non-proportional patterns
5.3d Homework: From Graphs to Stories				
5.3e Classroom Activity: From Stories to Graphs		Creating graphs from stories, labeling key features of graphs		Create a graph representing the distance from you to your locker for each period of a school day.
5.3e Homework:	Graph paper if wanted, the directions say to sketch so it is teacher's choice.			
Chapter 5 Test: Functions				

8th Grade

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Chapter 6: Statistics-Investigate Patterns of Association in Bivariate Data (2 weeks)

UTAH CORE Standard(s)

1. Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. (8.SP.1)

2. Know that straight lines are widely used to model relationships between two quantitative variables for scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. (8.SP.2)

3. Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height*. (8.SP.3)

4. Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores? (8.SP.4)*

CHAPTER OVERVIEW:

Up to this point, students have been studying data that falls on a straight line. Most of the time data given in the real world is not perfect; however, often the data is associated with patterns that can be described mathematically. In this chapter, students will investigate patterns of association in quantitative bivariate data by constructing and interpreting scatters plots, fitting a linear function to scatter plots that suggest a linear association, and using the function to solve problems and make predictions. In addition they explore categorical bivariate data by constructing and interpreting two-way frequency tables.

VOCABULARY:

experiment	outcomes	sample space	random variables
realizations	quantitative (numerical) variables	categorical variables	univariate data
bivariate data	scatter plot	association	positive association
negative association	no (zero) association	perfect association	linear association
non-linear	association	cluster	outlier
line of best fit	linear model	two-way frequency table	
marginal frequencies	relative frequencies		

Chapter 6: Statistics-Investigate Patterns of Association in Bivariate Data	**Materials Needed**	**Key Ideas**	**Optional/Extra Activities**	**Noteworthy**
6.0 Anchor Problem: How Much Does Your Brain Weigh?	Adapted from: Source: *http://mste.illinois.edu/malcz/DATA/BIOLOGY/Animals.html* *http://www.illustrativemathematics.org/illustrations/1520*	Visual evaluation of data		Consider how you might change this experiment, and the new results that you would predict.
6.1 Construct and Interpret Scatter Plots for Bivariate Data				
6.1a Class Activity: Interpret a Scatter Plot		Seeing coordinate pairs in tables. Looking at bivariate data sets in scatter plots.		Compare & Contrast dot plots and scatter plots? What different patterns are you looking for in each?

6.1a Homework: Interpret a Scatter Plot				
6.1b Class Activity: Create and Analyze a scatter plot	Measuring tape, graph paper	Data sampling, sample space.	Have the students choose their own body proportion variables to compare.	Research the Fibonacci Number (golden number), or Φ (phi). Where and how is it used in life?
6.1 b Homework: Create and Analyze a scatter plot				
6.1 c Classwork: Patterns of Association		Recognizing and evaluating linear and non-linear patterns in scatter plots, strong/weak, positive/negative, and clusters/outliers.		How would you evaluate your own body proportion data—linear/non-linear/no association? Did you find a Fibonacci relationship?
6.1 c Homework: Patterns of Association				
6.2 Use a Linear Model to Solve Problems	**Materials Needed**	**Key Ideas**	**Optional/Extra Activities**	**Noteworthy**
6.2 a Class Activity: Fit a Linear Model to Bivariate Data		Line of best fit and the prediction function		What should your best fit line say about future data collection?
6.2a Homework: Fit a Linear Model to Bivariate Data				
6.2b Class Activity: Tongue Twister	Stop watch.	Associations and extrapolations.		Describe, if any, valid extrapolations of your own data.
6.2b Homework: Tongue Twister Equ.		Relation of best fit line with extrapolations.		

6.3 Construct and Interpret Two-Way Frequency Tables to Analyze Categorcial Data	**Materials Needed**	**Key Ideas**	**Optional/Extra Activities**	**Noteworthy**
6.3a Class Activity: Construct Two-Way Frequency Tables using Categorical Data		Categorical variables, frequency, and two-way frequency tables.		How could you apply categorical variables and frequency tables in life?
6.3a Homework: Construct a Two-Way Frequency Table				
6.3b Class Activity: Interpret Two-way Frequency Tables		Numerical evidence and associations in two-way frequency tables.		What shows strong associations in a two-way frequency table?
6.3b Homework: Interpret Two-way Frequency Tables				
6.3c Class Activity: Conduct a Survey		Design an experiment using a survey to collect data. Evaluate a two-way frequency table.		Apply these concepts and skill in science.

8th Grade

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Chapter 7: Rational and Irrational Numbers (3 weeks)

UTAH CORE Standard(s)

Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational. (8.EE.2)

- Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers, show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number. (8.NS.1)
- Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g.,[2]). For example, by truncating the decimal expansion of √2, show that √2, is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations. (8.NS.2)

CHAPTER OVERVIEW:

Up to this point, students have been gradually building an understanding of the rational number system. In 8thgrade, students extend their knowledge of the number system even further to include irrational numbers. With the introduction of irrational numbers, students have now built an understanding of the real number system, those numbers that can be associated to a point on the real number line. Using tilted squares, students explore the meaning of square root and construct physical lengths of irrational numbers. They transfer these lengths to a number line and realize that even though we can construct the physical length of an irrational number and approximate its value, we cannot give an exact numerical value of an irrational number. As students work through the definition of an irrational number, they further solidify their understanding of rational numbers.Later in the chapter, students learn methods for approximating the numerical value of irrational numbers to desired degrees of accuracy, estimate the value of expressions containing irrational numbers, and compare and order rational and irrational numbers.

VOCABULARY:

square, perfect square, square root, √ , cube, perfect cube, cube root, √3, decimal expansion, repeating decimal, terminating decimal, rational number, irrational number, truncate, decimal approximation, real number, real number line

Chapter 7: Rational and Irrational Numbers	Materials Needed	Key Ideas	Optional/Extra Activities	Noteworthy
7.0 Anchor Problem: Zooming in on the Number Line		Numbers are infinite, there are always numbers in between any two given numbers.		How many numbers are there? How do you know?
7.1 Represent Numbers Geometrically				
7.1a Class Activity: Background Knowledge		Finding area of irregular figures and distances of lines		What does each box on the grid represent? What does each segment that connects consecutive dots represent?
7.1a Homework: Background Knowledge				
7.1b Class Activity: Squares, Squares and More Squares		Finding area given the length of a side and finding the length of a side given the area. Inverse operations.		How do I find the length of the side of the square if the area is 18 square feet? Show all steps.
7.1 b Homework: Squares, Squares and More Squares				

7.1c Class Activity: Squares, Squares and More Squares Continued		Apply the idea of area to rectangles to find the length of a diagonal. Not sure if they are wanting Pythagorean's Theorem here or not.		How do you know you created a line segment of length square root 5? Can you create another rectangle with the same diagonal length?
7.1 d Class Activity: Simplifying Square Roots	The Sieve of Eratosthenes could be helpful for finding square roots and factoring. If you Google it you'll find worksheets with instructions.	Simplifying square roots.		List the steps to simplifying square roots along with one example of your choice.
7.1d Homework: Simplifying Square Roots				
7.1e Classwork: Creating Cubes		Inverse operations, taking the cube root to solve.		How would you find the length of a side of a cube if the volume was 8 cubic inches? Show all steps.
7.1f Class Activity: Revisiting the Number Line		Use geometry to find the exact distances of square roots on the number line.		Pick one example from your classwork to add to your notes.
Section 7.2: Rational and Irrational Numbers	Materials Needed	Key Ideas	Optional/Extra Activities	Noteworthy
7.2a Class Activity: The Rational Number System		Review the different types of numbers and convert fractions into decimals using long division (not a calculator).	Venn diagram showing how the numbers relate to each other (subsets).	Write definitions in your own words for each of the following: whole number, integer, rational.
7.2a Homework: The Rational Number				

System				
7.2b Class Activity: Expressing Decimals as Fractions		How to write an equation to convert a repeating decimal into a fraction.		Pick one example from your classwork to add to your notebook.
7.2 b Homework: Expressing Decimals as Fractions				
7.2 c Class Activity: Expanding Our Number System		Rational vs Irrational Numbers		Write your own definition of rational and irrational numbers.
7.2c Homework: Expanding Our Number System				
7.2d Classwork: Approximating the Value of Irrational Numbers		Approximating irrational numbers.		Record the process for how to approximate an irrational number to the nearest hundredth.
7.2d Homework: Approximating the Value of Irrational Numbers				
7.2e Class Activity: Comparing and Ordering Real Numbers		Comparing and Ordering Real Numbers		
7.2e Homework: Comparing Ordering Real Numbers				
Chapter 7 Test: Rational and Irrational Numbers				

8th Grade

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Chapter 8: Integer Exponents, Scientific Notation and Volume (4 weeks)

UTAH CORE Standard(s)

1. Know and apply the properties of integer exponents to generate equivalent numerical expressions.

   For example, $3^2 + 3^{-5} = 3^{-3} = \frac{1}{3^3} = \frac{1}{27}$. (8.EE.1)

2. Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational. (8.EE.2)

3. Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.

   For example, estimate the population of the United States as 3 X 10^8 and the population of the world as 7 x 10^9, and determine that the world population is more than 20 times larger. (8.EE.3)

4. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurement of very large and very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology. (8.EE.4)

5. Know the formulas for volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. (8.G.9)

CHAPTER OVERVIEW:

Students begin this chapter with the study of integer exponents. They represent repeated multiplication in exponential form and begin to explore the properties of integer exponents as another method for transforming expressions. Through the investigation of these properties they learn to generate equivalent expressions in a quick and efficient way. They also generate properties related to negative exponents and an exponent of 0.

They look at simple exponential equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number and solve them. Another context in which we study exponents is scientific notation. This notation is used to denoted very small and very large numbers. Students learn to change numbers from standard form to scientific notation and vice versa. They also learn to perform operations with numbers in scientific notation. This enables them to work with, and analyze real world situations where large and small quantities exist. Finally, students will turn their focus to volume and how exponents play a role in the formulas for the volume of a cylinder, cone, and sphere. They use these problems to solve a variety of problems related to the volume of these three-dimensional objects.

VOCABULARY:

Exponent	base	power	square root	cube root
inverse operation	powers of ten	estimate	scientific notation	exponential form
normalized notation	standard form	cylinder	cone	sphere
pi	radius	diameter	slant height	volume	hemisphere

Chapter 8: Integer Exponents, Scientific Notation and Volume	**Materials Needed**	**Key Ideas**	**Optional/Extra Activities**	**Noteworthy**
8.0 Anchor Problem: Spiders	Adapted from: Source: http://www.annualreviews.org/doi/abs/10.1146/annurev.en.18.010173.001513 Ruler/Tape measure, and calculator	Visualizing scientific notation.		What factors might increase or reduce the spider population in a given area.
8.1 Integer Exponents				
8.1a Class Activity: Get Rich Quick		Exponents are repeated multiplication of integers		Research the decibel and how it relates to exponents.
8.1a Homework: Get Rich Quick				

8.1b Class Activity: Find, Fix and Justify Exponent Properties		Using tables to understand and explain and simplify products (additive) and quotients (subtractive) exponents.		When would you use these operations for large numbers?
8.1b Homework: Products of Powers and Quotients of Powers Properties				
8.1c Class Activity: Power of a Power, Power of Product, and Power of a Quotient		Using tables to understand and explain and simplify powers of powers, products, and quotients.		Research and find an application for exponential change.
8.1c Homework: Power of a Power, Power of Product, and Power of a Quotient			Have students share their research about exponential change.	
8.1d Class Activity: Find, Fix, and Justify		Apply knowledge of powers previously learned to algebraic expressions		What mathematical formulae do you know that involve powers?
8.1d Homework: Find, Fix, and Justify				
8.1e Class Activity: Zero and Negative Exponents		Demonstrate understanding of how the results of products and/or quotients of powers can be zero or negative, and what such results mean.		Does a negative exponent make the number is negative? What does a zero exponent mean?

8.1e Homework: Zero and Negative Exponents				
8.1f Class Activity: Properties of Exponents Game and Mixed Practice	Copies of the puzzle and scissors.	Practice with algebraic expressions involving exponents.		When do we see mathematical formulae using exponents? Physics?
8.1f Homework: Properties of Exponents and Mixed Practice				
8.2 Solutions to Equations Using Square and Cube Roots	**Materials Needed**	**Key Ideas**	**Optional/Extra Activities**	**Noteworthy**
8.2a Class Work: Solve Equations Using Square and Cube Roots		Understand and using square and cube roots for real-life problems—including text form.		Compare square, and cube roots with their inverse operations.
8.2a Homework: Solve Equations Using Square and Cube Roots				
8.2b Class Activity: Tower Views		More advanced practice in solving exponential contextual real-life problems.		Can you come up with a real-life problem to stump your friends—and the teacher?
8.2b Homework: Driving, Running, and Basketball			Use practice problems from students	
8.3 Scientific Notation	**Materials Needed**	**Key Ideas**	**Optional/Extra Activities**	**Noteworthy**
8.3a Class Activity: Place Value (opt.)		Review of place value and effect of adding “0”		

8.3b Class Activity: Scientific Notation		Understanding a method of writing very large and/or very small numbers in short form.		How does a zero power of 10 in scientific notation affect the number?
8.3b Homework: Scientific Notation				
8.3c Class Activity: Multiplying and Dividing with Scientific Notation		Obtaining products and quotients without changing the numbers to standard form. Applying scientific notation from context.		What standard form errors could possibly be avoided by correctly performing calculations in scientific notation?
8.3c Homework: Multiplying and Dividing with Scientific Notation				
8.3d Class Activity: More Operations with Scientific Notation		Obtaining sums and differences without changing the numbers to standard form—including in context.		What is unique about adding or subtracting numbers with very large powers of ten with small?
8.3d Homework: More Operations with Scientific Notation				
8.3e Class Activity: Matching, Ordering, and Problem Solving with Scientific Notation		Advanced review of ordering and writing powers of 10; as well as using scientific notation in real-life context.		Where do mathematicians and scientists use scientific notation?
8.3e Homework: Matching, Ordering, and Problem Solving with Scientific Notation				

8.3f Class Activity: Problem Solving with Scientific Notation		Using scientific notation in real-life problems from textual references.		Write a real-life problem for your classmates to solve.
8.3f Homework: Problem Solving with Scientific Notation			Use student practice problems.	
8.4 Volume of Cylinders, Cones, and Spheres	**Materials Needed**	**Key Ideas**	**Opt./Extra Activities**	**Noteworthy**
8.4a Class Activity: Wet or Dry? (optional)	Enough different shaped (not necessarily different volume) cans to supply each group of 2-4 students with two cans per group. Caution: Particular participating students must understand the risk of getting a little wet.	Visualizing and calculating volume. Understanding the relationship between cm^3 and ml.		How do powers (exponents) come into play with volume calculations?
8.4b Class Activity: How Much Water?		Visualizing and calculating volume. Understanding the relationship between cm^3 and ml.	May be substituted for previous activity	How do powers (exponents) come into play with volume calculations?
8.4b Homework: Volume of Cylinders				
8.4c Class Activity: Volume of Cones		Understanding the relationship between volumes of a cone and a cylinder.		What needs to be the same for the ratio between a cone and cylinder to be 1/3?
8.4c Homework: Volume of Cones				
8.4d Class Activity: Volume of Spheres		Understanding the relationship between volumes of a sphere and a cylinder.		What must be the same for the ratio between a sphere and cylinder to be 4/3?
8.4d Homework: Volume of Spheres				

8.4e Class Activity: Volume of Cylinders, Cones, and Spheres		Solving detailed real-life problems containing cylinders, cones, and spheres.		Write a detailed real-life problem for your classmates to solve.
8.4e Homework: Volume of Cylinders, Cones, and Spheres			Use student practice problems.	
8.4f Class Activity: Banana Splits	For each student: graph paper, string, rulers, pen or pencil, banana, ice-cream, ice-cream scoop, and chocolate syrup topping.	Application: Educated estimations of volume.	Have the students calculate estimations of how much ice-cream and topping is required for a class banana split party.	In what specific circumstances might accurate estimations of volume apply?

8th Grade

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Chapter 9: Geometry: Transformations, Congruence, and Similarity

Utah Core Standard(s):

- Verify experimentally the properties of rotations, reflections, and translations: (8.G.1)
  a) Lines taken to lines, and line segments of the same length.
  b) Angles are taken to angles of the same measure.
  c) Parallel lines are taken to parallel lines.
- Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. (8.G.2)
- Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. (8.G.3)
- Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits similarity between them. (8.G.4)

CHAPTER OVERVIEW:

In this chapter, students explore and verify the properties of translations, reflections, rotations, and dilations. Students learn about the different types of rigid motion (translations, reflections, and rotations), execute them, and write coordinate rules to describe them. They describe the effects of these rigid motions on two-dimensional figures. Students then use this knowledge to determine whether one figure is congruent to another, understanding the two figures are congruent if there is a sequence of rigid motions that takes on figure onto the other. Then, students study dilations, again exploring and verifying the properties of dilations experimentally. They describe and execute dilations. They use this knowledge to determine whether one figure is similar to another, understanding that a two-dimensional figure is similar to another if there is a sequence of rigid motions and dilations that takes one figure onto the other.

VOCABULARY:

Transformation, translation, reflection, rotation, rigid motion, image, pre-image, corresponding vertices, corresponding segments, corresponding angles, corresponding parts, coordinate rule, perpendicular bisector, line of reflection, slope, horizontal line, vertical line, clockwise, counterclockwise, center of rotation, angle of rotation, origin, concentric circles, congruent, dilation, center of dilation, scale factor, similar

Chapter 9: Geometry: Transformations, Congruence, and Similarity	Materials Needed	Key Ideas	Optional/Extra Activities	Noteworthy
9.0 Anchor Problem: Congruence and Similarity	Transparencies and vis-à-vis markers to help students make transformations	The difference between congruence and similarity; the ideas of reflections, rotations and slides begin to surface		Define similarity and congruent
9.1 Rigid Motion and Congruence				
9.1a Classwork: Properties of Translations		Translations, including notation to describe a translation		What is a translation? Record the correct notation to perform a given translation.
9.1a Homework: Properties of Translations				
9.1b Classwork: Properties of Reflections	Transparencies and vis-à-vis markers to help students make transformations, rulers	Reflecting over x, y axis, horizontal, vertical lines, and "slanted" lines, the slopes of lines that connect the image to the pre-image are parallel and the reflection line is the perpendicular bisector	Strongly recommend using transparencies or patty paper so that students can see and draw the reflections	List what happens to the coordinates of a figure when it is reflected over the x-axis, y-axis, the line y = x, and the line y = -x; what is a perpendicular bisector
9.1 b Homework: Properties of				

Reflections				
9.1c Classwork: Properties of Rotations	Compass, tracing paper or transparency or patty paper	Rotating figures especially 90 and 180 degrees about the origin		What are the coordinates after a rotation of 90, 180? What pattern do you notice?
9.1c Homework: Properties of Rotations				
9.1 d Classwork: Properties of Rotations cont.	Tracing paper or transparency or patty paper	Rotating figures especially 90 and 180 degrees not about the origin		How can you use slope to verify a rotation of 90 degrees?
9.1d Homework: Properties of Rotations cont.				
9.1e Classwork: Congruence	Tracing paper or transparency or patty paper	Series of transformations vs one single transformation		Reflect over the y-axis, then over the x-axis is the same as?
9.1e Homework: Congruence				
9.1f Classwork: Congruence cont.	Tracing paper or transparency or patty paper	Determining congruence through translations, corresponding parts		Define congruent.
9.1f Homework: Congruence cont.				
Section 9.2: Dilations and Similarity	Materials Needed	Key Ideas	Optional/Extra Activities	Noteworthy
9.2a Class Activity: Video Game Animation		Dilations using coordinate rules		What happens when a figure undergoes a dilation?
9.2b Classwork: Properties of Dilations	Ruler	Center of dilation, scale factor, coordinate rule		What is true of the center of dilation and corresponding vertices of dilated images?
9.2 b Homework: Properties of Dilations				

9.2 c Classwork: Expanding Our Number System	Ruler	Drawing dilations given center of dilation and scale factor		How does scale factor affect the result?
9.2d Classwork: Problem Solving with Dilations	Ruler	Using clues to create a dilation given information about image and pre-image points.		Dilations 1) Same shape, different size 2) Corresponding angles are congruent 3) The ratios of corresponding sides remains constant
9.2d Homework: Review of Dilations				
9.2e Classwork: Similarity	ruler	Incorporate translations into dilations		
9.2e Homework: Similarity				
9.2f Classwork: Similarity cont.	Transparency	Determine whether figures are congruent, similar or neither		
9.2f Homework: Similarity cont.				
Chapter 9 Test: Geometry: Transformations, Congruence, and Similarity				

8th Grade

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Chapter 10: Geometry II-Angles, Triangles, and Distance

UTAH CORE Standard(s)

- Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so. (8.G.5)
- Explain a proof of the Pythagorean Theorem and its converse. (8.G.6)
- Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. (8.G.7)
- Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. (8.G.8)

CHAPTER OVERVIEW:

This chapter focuses on several of the theorems related to angles and triangles. In the first section, students will study theorems about the angles in a triangle, the special angles formed when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. They will apply these theorems to solve problems. In Sections 2 and 3, students will study the Pythagorean Theorem and its converse and realize the usefulness of the Pythagorean Theorem in solving many real-world problems. In this chapter, we are referring to these theorems as a collection of facts. The focus in 8th grade is that students are able to observe these facts through examples, exploration, and concrete models. Students will construct mathematical arguments as to why the theorems are true, relying on knowledge acquired throughout the year, particularly the properties of rigid motion and dilations and the understanding of congruence and similarity. The arguments made by students will come in many different forms, including a bulleted list, a narrative paragraph, a diagram without words, and proof by example. The emphasis is on students starting to gain an understanding of what makes a good proof. They should be asking themselves questions such as: What information am I given? Would drawing a diagram be helpful? What does the geometric notation mean? What am I trying to show specifically? What do I already know that I can apply? What tools would be useful? Am I supporting my arguments with mathematical evidence? Am I communicating clearly? Can someone else follow my logic? These practices engaged in by students set the foundation for a more formal study of proof in Secondary II.

VOCABULARY:

Right triangle, right angle, congruent, leg, hypotenuse, Pythagorean Theorem, converse of Pythagorean Theorem, simplest radical form, Pythagorean triple, rectangular prism, cube, unit cube, distance formula, vertical angles, adjacent angles, straight angles, supplementary, congruent, parallel lines, ||, transversal, vertex, point of intersection, corresponding angles, alternate exterior angles, alternate interior angles, similar, angle-angle criteria for triangles

Chapter 10: Geometry-Angles, Triangles, and Distance	Materials Needed	Key Ideas	Optional/Extra Activities	Noteworthy
10.0 Anchor Problem: Construction		Writing linear equations, comparing linear equations		Review the parts of y = mx + b
10.1 Angles and Triangles				
10.1a Classwork: Straight and Vertical Angles		Straight and vertical angles and finding the measures of angles by creating equations and solving for x.		Draw and define straight and vertical angles.
10.1a Homework: Straight and Vertical Angles				
10.1b Classwork: Parallel Lines and Angles		Parallel lines, transversal, corresponding angles, alternate exterior angles, alternate interior angles; conditions for determining if two lines are parallel	Use lined notebook paper, ruler, and a protractor to create your own parallel lines, transversal and then measure each of the 8 angles formed to verify the relationships	Define and draw Parallel lines, transversal, corresponding angles, alternate exterior angles, alternate interior angles
10.1 b Homework: Parallel Lines and Angles				

10.1c Class Activity: Tesselating Triangles	Index card, scissors, white paper and 3 colored pencils per person *Be sure to save this drawing for the next section!	Observing special angle types in the tessellation, finding missing measures of triangles		How do you know the sum of the interior angles of a triangle is 180 degrees?
10.1c Homework: Finding Angle Measures in Triangles				
10.1d Classwork: Similar Triangles		Similar triangles have proportional sides and congruent angles.	You may want to consider instead of the "I" above the independent, etc., using two different colors of colored pencils to distinguish the two.	What variable is associated with the x value? The y value?
10.1 d Homework: Similar Triangles				
Section 10.2: The Pythagorean Theorem	Materials Needed	Key Ideas	Optional/Extra Activities	Noteworthy
10.2a Class Activity: A Proof of the Pythagorean Theorem	Scissors, copies of the lesson, tape	Discovering the Pythagorean Theorem		Tape your evidence of the Pythagorean Theorem in your notes
10.2a Homework: A Proof of the Pythagorean Theorem				
10.2 b Class Activity: The Pythagorean Theorem and Tilted Squares		Creating squares of certain criteria using non-vertical, horizontal triangles		
10.2 b Homework: The Pythagorean Theorem and Tilted				

Squares				
10.2 c Class Activity: The Pythagorean Theorem and Unknown Side Lengths			The Pythagorean Theorem Game	Give two examples of solving for unknown sides. One where you know both legs and one where you know a leg and hypotenuse.
10.2c Homework: The Pythagorean Theorem and Unknown Side Lengths				
10.2d Classwork: The Converse of the Pythagorean Theorem		If $a^2 + b^2 = c^2$, then the triangle must be a right triangle.		
10.2d Homework: The Converse of the Pythagorean Theorem				
10.2e Class Activity: Exploration with Pythagorean Triples		Patterns with Pythagorean Triples		List 5 Pythagorean Triples.
Section 10.3: Applications of the Pythagorean Theorem	Materials Needed	Key Ideas	Optional/Extra Activities	Noteworthy
10.3a Classwork: Applications of the Pythagorean Theorem		Story problems with the Pythagorean Theorem.		Create a story problem that can be solved using the Pythagorean Theorem.
10.3a Homework: Applications of the Pythagorean Theorem				
10.3b Classwork: Finding Distance Between Two Points	Centimeter ruler	Use Pythagorean Theorem to find the distance between points.		Given two points of your choice, explain how to find the distance. Include a graph to illustrate your work.
5.3b Homework: Finding Distance				

Between Two Points				
Chapter 10 Test: Geometry II: Angles, Triangles, and Distance				