Course 3 MATHia® Software
Table of Contents for Supplemental Implementations

CARNEGIE LEARNING

1	Linear Equations									
MATHia Unit	**MATHia Workspace**	**Overview**	**CCSS**	Problem Solving	Animation	Worked Examples	Classification Tools	Explore
Solving Linear Equations	Exploring Two-Step Equations	Students use a balance tool to explore two-step equations. They use a general strategy to solve any two-step equation.	8.EE.C.7.b					●
	Solving Multi-Step Equations	Students practice solving equations algebraically using a variety of strategies, including using a balance tool.	8.EE.C.7.b					●
Linear Models and the Distributive Property	Modeling with Integer Rates of Change	Students will determine linear expressions with integer coefficients that represent real-world contexts. They will use these expressions to solve problems.	8.F.B.4	●				
	Modeling with Fractional Rates of Change	Students will determine linear expressions with fraction or decimal coefficients that represent real-world contexts. They will use these expressions to solve problems.	8.F.B.4	●				
	Modeling using the Distributive Property over Division	Students will use the Distributive Property over Division to determine and represent expressions for real-world contexts. They will use these expressions to solve problems.	8.F.B.4	●				

*Indicates practice problems

2 Functions and Linear Models

MATHia Unit	MATHia Workspace	Overview	CCSS	Problem Solving	Animation	Worked Examples	Classification Tools	Explore
Relations and Functions	Exploring Functions	Students use an interactive function machine to explore mystery functions. Students use the function machine and a table to identify functions. They also use the machine along with sorting activities to identify the domain and range of different functions.	8.F.A.1					●
	Exploring Graphs of Functions	Students use an interactive function machine and a graph to identify and analyze function equations and graphs. Students identify intercepts of the graphs.	8.F.A.1					●
	Classifying Relations and Functions	Students watch an animation and follow worked examples as they learn how to classify relations as functions or non-functions.	8.F.A.1		●	●		
	Identifying Key Characteristics of Graphs of Functions	Students will identify key characteristics from the graph of a function, such as the intercepts, minimum and maximum x-values, minimum and maximum y-values, domain, and range.	8.F.B.5	●				
Linear Models	Graphing Given an Integer Slope and y-Intercept	Students will write the equations of lines given an integers lope and a y-intercept.	8.F.B.4	●				
	Graphing Given a Decimal Slope and y-Intercept	Students will write the equations of lines given a decimal-value slope and a y-intercept.	8.F.B.4	●				
	Modeling Linear Equations in Standard Form	Students follow worked examples and analyze linear equations in standard form. Students identify components of linear equations and their meaning in terms of problem situation.	8.F.B.4			●		
Graphs of Linear Equations in Two Variables	Graphing Linear Equations using a Given Method	Students graph relations given in standard form by applying an indicated method: the slope-intercept method, two-points method, or two-intercepts method.	8.F.B.4	●				
	Graphing Linear Equations using a Chosen Method	Students are given a relation and a choice as to which method to use to graph it. Students are then given information about the line appropriate to the chosen method.	8.F.B.4	●				
Writing Equations of a Line	Modeling Given Slope and a Point	Students graph relations given in standard form by applying an indicated method: the slope-intercept method, two-points method, or two-intercepts method.	8.F.B.4	●				
	Calculating Slopes	Students are given a relation and a choice as to which method to use to graph it. Students are then given information about the line appropriate to the chosen method.	8.F.B.4	●				
	Modeling Given Two Points	Students are given the ordered pairs for two points, either mathematically or in context and are asked to identify the equation of the line that connects the points.	8.F.B.4	●				
	Modeling Given an Initial Point	Students define variables and write expressions and relations to describe linear contexts.	8.F.B.4	●				
	Modeling Linear Functions using Multiple Representations	Students model problems using expressions, tables, and graphs. Students use number properties to evaluate and solve one-step and two-step equations.	8.F.B.4	●				

*Indicates practice problems

3	Right Triangles				Problem Solving	Animation	Worked Examples	Classification Tools	Explore
MATHia Unit	**MATHia Workspace**	**Overview**		**CCSS**					
Rational and Irrational Numbers	Introduction to Irrational Numbers	Students determine perfect squares and their square roots. They use rational approximations to determine decimal approximations of square roots of non-perfect squares. Students watch an animation about the real number system and classify real numbers as rational or irrational.		8.BS.A.1 8.NS.A.2 8.EE.A.2		●			
	Graphing Real Numbers on a Number Line	Students practice plotting various real numbers on a number line. Students approximate, if necessary, and plot decimals, percents, fractions, square roots, and pi.		8.NS.A.1 8.NS.A.2	●				
	Ordering Rational and Irrational Numbers	Students use a number line tool to plot approximate values of real numbers and then compare and order the numbers.		8.NS.A.1 8.NS.A.2					●
The Pythagorean Theorem	Exploring the Pythagorean Theorem	Students explore a variety of right triangles and answer questions about proofs of the Pythagorean Theorem and its converse.		8.G.B.6					●
	Applying the Pythagorean Theorem	Students increase their familiarity with using the Pythagorean Theorem by analyzing worked examples.		8.G.B.7 8.EE.A.2			●		
	Problem Solving using the Pythagorean Theorem*	Students solve for an unknown side length of a right triangle in real-world problems by using the Pythagorean Theorem.		8.G.B.7 8.EE.A.2					
	Calculating Distances on the Coordinate Plane	Students determine distances on the coordinate plane using the Pythagorean Theorem.		8.G.B.8 8.EE.A.2					●

*Indicates practice problems

4	Geometric Transformations			Problem Solving	Animation	Worked Examples	Classification Tools	Explore
MATHia Unit	**MATHia Workspace**	**Overview**	**CCSS**					
Transformations of Figures on the Coordinate Plane	Translating Plane Figures	Students will select translations that match a pre-image to a target image figure, given a reference point.	8.G.A.3	●				
	Rotating Plane Figures	Students will select rotations that match a pre-image to a target image figure, given a reference point.	8.G.A.3	●				
	Reflecting Plane Figures	Students will select reflections over lines that match a pre-image to target image figure, given a reference point.	8.G.A.3	●				
	Dilating Plane Figures	Students will select dilations that match a pre-image to target image figures, given a reference point.	8.G.A.3	●				
	Performing One Transformation	Students will select a translation, rotation, reflection, or dilation that matches a pre-image to a target image figure, given a reference point.	8.G.A.3	●				
	Performing Multiple Transformations	Students will Select multiple transformations from translation, rotation, reflection, and dilation to match a pre-image to a target image figure, given a reference point.	8.G.A.3	●				

*Indicates practice problems

5	Angle Relationships			Problem Solving	Animation	Worked Examples	Classification Tools	Explore
MATHia Unit	**MATHia Workspace**	**Overview**	**CCSS**					
Lines Cut by a Transversal	Classifying Angles Formed by Transversals	Students follow worked examples and complete sorting activities as they learn to identify angles and angle pairs formed by lines cut by a transversal.	8.G.A.5			●	●	
	Reasoning about Angles Formed by Transversals*	Students solve reasoning problems involving angle measures formed by lines cut by a transversal.	8.G.A.5					

*Indicates practice problems

6	Systems of Linear Equations				Problem Solving	Animation	Worked Examples	Classification Tools	Explore
MATHia Unit	**MATHia Workspace**	**Overview**		**CCSS**					
Linear Equations with Variables on Both Sides	Solving with Integers (No Type In)	Students will solve equations with variables on both sides of the equals sign.		8.EE.C.7.b	●				
	Solving with Integers (Type In)	Students will solve equations with variables on both sides of the equals sign.		8.EE.C.7.b	●				
	Solving Equations with One Solution, Infinite, and No Solutions	Students follow worked examples as they learn to identify equations with one solution, no solutions, and infinite solutions. Students also check the solutions to equations.		8.EE.C.7.a			●		
	Sorting Equations by Number of Solutions	Students complete sorting activities to practice identifying linear equations with one, no, and infinite solutions.		8.EE.C.7.a				●	
Systems of Linear Equations	Modeling Linear Systems Involving Integers	Students will write multiple expressions with integer coefficients and use equations to solve systems and determine break-even points in the context of real-world problems.		8.EE.C.8.a 8.EE.C.8.b 8.EE.C.8.c	●				
	Modeling Linear Systems Involving Decimals	Students will write multiple expressions with decimal coefficients and use equations to solve systems and determine break-even points in the context of real-world problems.		8.EE.C.8.a 8.EE.C.8.b 8.EE.C.8.c	●				
	Solving Linear Systems using Substitution	Students will solve systems of equations with one solution using substitution in mathematical contexts.		8.EE.C.8.b	●				

*Indicates practice problems

7	Exponents			Problem Solving	Animation	Worked Examples	Classification Tools	Explore
MATHia Unit	**MATHia Workspace**	**Overview**	**CCSS**					
Properties of Whole Number Exponents	Using the Product Rule and the Quotient Rule	Students will simplify mathematical expressions using the Product and quotient Rules.	8.EE.A.1	●				
	Using the Power to a Power Rule	Students will simplify mathematical expressions using the Power to a Power Rule.	8.EE.A.1	●				
	Using the Product to a Power Rule and the Quotient to a Power Rule	Students will simplify mathematical expressions using the Product to a Power and the Quotient to a Power Rules.	8.EE.A.1	●				
	Using Properties of Exponents with Whole Number Powers	Students will use a variety of strategies, including the Power to a Power Rule, the Product to a Power Rule, and the Quotient to a Power Rule to simplify mathematical expressions with exponents.	8.EE.A.1	●				
	Simplifying Expressions with Negative and Zero Exponents	Students will simplify mathematical expressions involving negative exponents and exponents of 0.	8.EE.A.1	●				
Scientific Notation	Using Scientific Notation	Students write numbers in standard form as numbers in scientific notation and write numbers in scientific notation as numbers in standard form.	8.EE.A.4	●				
	Comparing Numbers using Scientific Notation	Students follow worked examples as they learn how to compare numbers written in scientific notation.	8.EE.A.3			●		

*Indicates practice problems

8	Volume				Problem Solving	Animation	Worked Examples	Classification Tools	Explore
MATHia Unit	**MATHia Workspace**	**Overview**		**CCSS**					
Volume	Calculating Volume of Cylinders	Students will use mathematical and real-world objects to determine the volume of cylinders.		8.G.C.9	●				
	Using Volume of Cylinders	Students will apply the formula for the volume of a cylinder to solve a variety of different problems.		8.G.C.9	●				
	Calculating Volume of Cones	Students will use mathematical and real-world objects to determine the volume of cones.		8.G.C.9	●				
	Using Volume of Cones	Students will apply the formula for the volume of a cone to solve a variety of different problems.		8.G.C.9	●				
	Calculating Volume of Spheres	Students will apply the formula for the volume of a sphere to solve a variety of different problems.		8.G.C.9	●				
	Using Volume of Spheres	Students will apply the formula for the volume of a sphere to solve a variety of different problems.		8.G.C.9	●				

*Indicates practice problems

9	Bivariate Data			Problem Solving	Animation	Worked Examples	Classification Tools	Explore
MATHia Unit	**MATHia Workspace**	**Overview**	**CCSS**					
Lines of Best Fit	Estimating Lines of Best Fit	Students describe the patterns of association in scatter plots and select the most appropriate line of best fit for a scatter plot.	8.SP.A.1 8.SP.A.2				●	
	Using Lines of Best Fit*	Students practice interpreting the meaning of lines of best fit and using the lines to make predictions.	8.SP.A.2 8.SP.A.3					

*Indicates practice problems