

<div style="background-color: black; color: white; padding: 10px; font-size: 2em; font-weight: bold; display: inline-block;">1</div> <div style="background-color: #00a0e3; color: white; padding: 10px; font-size: 2em; font-weight: bold; display: inline-block;">Thinking Proportionally</div>						Strategies													
						Animations	Classifications	Explore Tools	Graphing Tools	Interactive Diagrams	Interactive Worksheets	Proof	Real-World Scenarios	Solvers	Worked Example				
MATHia Unit	MATHia Workspace	Overview	CCSS	Concept Builder	Mastery														

Circles and Ratio																			
<b>Circles</b>	Investigating Circles	Students identify parts of a circle, analyze the ratio of circumference to diameter of various circles, and then define pi. They informally derive the area of a circle by investigating the relationship between circumference and area. Students calculate the area of a circle given different measurements for a radius or diameter.	7.G.4	✓															
	Calculating Circumference and Area of Circles	Students determine the circumference and area of circles using diagrams and real-world objects. Students work strategically to identify measurements and use the formula for circumference and area to solve problems.	7.G.4		✓														

Fractional Rates																			
<b>Ratio and Rate Reasoning</b>	Fractional Rates	Students determine fractional unit rates and unit rates given complex ratios. They solve problems involving fractional rates by scaling up and down within ratio tables.	7.RP.1	✓															
	Determining and Comparing Unit Rates	Students develop fluency in determining and comparing unit rates.	7.RP.1		✓														
<b>Proportional Reasoning</b>	Proportional Relationships	Students review proportional relationships by recognizing proportions in ratios, tables, and graphs.	7.RP.2a	✓															
	Determining Characteristics of Graphs of Proportional Relationships	Given graphs, students determine if the graph represents a direct variation equation.	7.RP.2a	✓															
	Solving Proportions Using Equivalent Ratios	Students calculate unknown values in a given scenario using equivalent ratios.	7.RP.2c		✓														

1 Thinking Proportionally						Strategies									
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Proportional Reasoning (continued)	Rewriting Proportions as Products	Students notice patterns in proportions written in the form $a : b = c : d$ . They rewrite proportions as the product of the means equal to the product of the extremes. Students isolate the variable in proportions with an unknown quantity. They solve problems using proportions and the means and extremes method.	7.RP.2c	✓							•		•		•
	Solving Proportions Using Means and Extremes	Students calculate unknown values in a given scenario using the means and extremes method.	7.RP.2c		✓								•		

Proportionality															
Representing Proportional Relationships by Equations	Exploring Proportions	Given a scenario, students define the varying quantities, write proportions, and determine the common ratio between the two variables. They then use the proportions to write direct variation equations and solve problems.	7.RP.2a 7.RP.2b	✓										•	•
	Writing Proportional Relationships with Equations	Given a table, students determine a constant of proportionality, write an associated proportion, graph the points from the table, and write a direct variation equation for the table.	7.RP.2b 7.RP.2c		✓				•					•	
	Converting Between Forms of Proportional Relationships	Given a scenario, students define variables, determine a constant of proportionality, write a proportion, and write a specified direct variation equation.	7.RP.2b 7.RP.2c		✓									•	
	Modeling the Constant of Proportionality	Given a scenario, students complete a table of values, write a direct variation equation, plot values from the table, and draw the line representing the direct variation equation.	7.RP.2.b 7.RP.2.d		✓				•	•			•	•	

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Proportional Relationships																			
Percent Conversions	Fractional Percent Models	Students extend their understanding of percent models to models that include fractional percents and percents less than 1. Students watch an animation and answer questions to deepen their understanding of conversions.	7.RP.3	✓															
	Converting with Fractional Percents	Students practice converting between fractions, decimals, and percents.	7.RP.3	✓															
Proportional Reasoning and Percents	Using Proportions to Solve Percent Problems	Students examine partial worked examples to solve for the part, percent, or whole in percent problems using equivalent fractions and proportions.	7.RP.3	✓															
	Solving Simple Percent Problems	Students practice problems in which they solve for the part, the percent, or whole in percent problems using proportions.	7.RP.3	✓															
Problem Solving with Percents Using Proportional Relationships	Calculating Percent Change and Final Amounts	Students determine the percent increase or decrease or the final amount in a percent change problem using equivalent ratios or means and extremes.	7.RP.3		✓														
	Using Percents and Percent Change	Students will use proportions to solve a variety of percent equations from given scenarios.	7.RP.3		✓														
Calculating Sales Tax and Discounts	Calculating Sales Tax or Discounts	Students solve personal finance problems involving either sales tax or discounts.	7.RP.3		✓														
	Solving Problems with Both Sales Tax and Discounts	Students solve personal finance problems involving both sales tax and discounts.	7.RP.3		✓														
	Analyzing Different Forms of Expressions	Students follow worked examples that show that expressions can be rewritten to describe sales tax and discount situations in many ways. Students rewrite expressions describing situations and interpret the rewritten expressions to highlight the different ways the expressions reveal different aspects of the situations.	7.EE.2 7.RP.3	✓															

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Scale Drawings	Critical Attributes of Similar Figures	Students watch an animation which uses an eclipse as a context to explain similarity. Students learn that the corresponding angles of similar figures are congruent and the corresponding side lengths are proportional. They use these attributes--corresponding angles and proportional side lengths--to identify similar figures and to show that congruent figures are also similar.	7.GM.1	✓		•									
	Using Scale Drawings	Students analyze models to determine whether they are scale drawings of larger objects. They use scale factors and proportions to determine lengths and areas of scaled figures.	7.G.1	✓		•	•					•		•	
	Using Scale Factor	Students use scale factors to determine unknown measures in real-life scenarios.	7.G.1		✓							•			

2		Operating with Signed Numbers				Strategies											
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Adding and Subtracting Rational Numbers																	
Integer Operations	Understanding Opposites	Students watch an animation that introduces opposite values and describes how opposite values on a number line have the same absolute value. The animation explains why direction and the meaning of 0 are important when thinking about opposite quantities in situations. Students determine the opposites of numbers, show that the sum of a number and its opposite is 0, and use what they know about opposites to add positive and negative numbers in context.	7.NS.1a 7.NS.1b	✓			•										
	Adding and Subtracting Negative Integers	Students use an interactive number line to add and subtract negative numbers.	7.NS.1	✓				•									
	Using Number Lines to Add and Subtract Integers	Students practice adding and subtracting on number lines using a similar model to the one they used on the interactive number line.	7.NS.1		✓				•						•		
	Developing Algorithms for Adding or Subtracting Integers	Students connect number line models of sums of integers with the same sign to an algorithm for adding integers with the same sign. They do the same for the sums of integers with different signs. Students then notice that the models for subtracting integers are the same as the models for adding the opposite of the number. They rewrite subtraction expressions as addition expressions and use the rules for adding integers to determine the sum.	7.NS.1.b 7.NS.1.c	✓													

Multiplying and Dividing Rational Numbers																		
Integer Operations	Multiplying and Dividing Integers	Students model problems involving the multiplication of integers and use fact families to explore dividing integers.	7.NS.2b	✓			•											•
	Converting Rational Numbers to Decimals	Students divide fractions to determine if the resulting equivalent decimal is terminating or repeating.	7.NS.2d		✓				•									•

2		Operating with Signed Numbers				Strategies									
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Evaluating Numeric Expressions	Evaluating Simple Numeric Expressions with Integers	Students practice evaluating two-step numeric expressions that contain integer values.	7.NS.3		✓										
	Evaluating Numeric Expressions Involving Integers with Parentheses and Exponents	Students practice evaluating numeric expressions that contain integer values, parentheses, and exponents.	7.NS.3		✓										
	Evaluating Simple Numeric Expressions with Rational Numbers	Students practice evaluating a variety of simple numeric expressions that contain integer values.	7.NS.3		✓										
	Evaluating Complex Numeric Expressions with Rational Numbers	Students practice evaluating a variety of complex numeric expressions that contain integer values.	7.NS.3		✓										

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Algebraic Expressions																			
<b>Variable Expressions</b>	Factoring Linear Expressions	Students model the product of two factors and explore different factors of expressions through the use of an interactive tool. They use the Distributive Property in reverse to factor expressions.	7.EE.1	✓															
	Rewriting Simple Algebraic Expressions Involving Integer Coefficients	Students rewrite algebraic expressions that contain integer coefficients by combining like terms, using number properties, and applying the Order of Operations.	7.EE.1		✓														
	Rewriting Algebraic Expressions Involving Integer Coefficients with Four Operations	Students rewrite multi-step algebraic expressions that contain integer coefficients by combining like terms, using number properties, and applying the Order of Operations.	7.EE.1		✓														
	Rewriting Algebraic Expressions Involving Integer Coefficients with Parentheses and Exponents	Students rewrite algebraic expressions that contain integer coefficients, parentheses, and exponents by combining like terms, using number properties, and applying the Order of Operations.	7.EE.1		✓														
	Rewriting Complex Algebraic Expressions Involving Integer Coefficients	Students rewrite complex algebraic expressions that contain integer coefficients by combining like terms, using number properties, and applying the Order of Operations.	7.EE.1		✓														
	Rewriting Algebraic Expressions Involving Integer Coefficients	Students rewrite a variety of algebraic expressions that contain integer coefficients by combining like terms, using number properties, and applying the Order of Operations.	7.EE.1		✓														

Two-Step Equations and Inequalities																			
<b>Modeling Two-Step Expressions and Equations</b>	Using Picture Algebra with Equations	Students will create visual models for given scenarios, write two-step expressions and equations, and then use mental math to solve for unknown values.	7.EE.4	✓															

3 Reasoning Algebraically		Strategies													
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Modeling Two-Step Expressions and Equations (continued)	Identifying Attributes of Linear Relationships	Students identify attributes of linear relationships from a scenario and from a graph by determining whether the starting value is positive or negative and whether the rate of change is positive or negative. They interpret the model of a two-step linear equation.	7.EE.4	✓											
	Analyzing Models of Two-Step Linear Relationships	Students analyze scenarios of two-step linear relationships. They are given an equation that models the scenario. Students then match the different expressions in the equation to verbal descriptions of these quantities in the context of the scenario.	7.EE.4		✓										
	Modeling Two-Step Expressions	From given scenarios, students determine unknown values and enter values into tables to recognize patterns. Students express these patterns in two-step expressions.	7.EE.4		✓										
Solving Two-Step Equations	Checking Solutions to Linear Equations	Students substitute given values into two-step equations to determine the values are solutions to the equations.	7.EE.4a		✓										
	Solving with Multiplication (No Type In)	Students solve two-step equations involving multiplication using the solver.	7.EE.4a		✓										
	Solving with Multiplication (Type In)	Students solve two-step equations involving multiplication.	7.EE.4a		✓										
	Solving with Division (No Type In)	Students solve two-step equations involving division using the solver.	7.EE.4a		✓										
	Solving with Division (Type In)	Students solve two-step equations involving division using the solver.	7.EE.4a		✓										
	Solving Two-Step Equations	Students solve two-step equations involving all four operations.	7.EE.4a		✓										
Solving Two-Step Inequalities	Graphing Inequalities with Rational Numbers	Students graph simple inequalities involving rational numbers on a number line.	7.EE.4b		✓										
	Solving One-Step Linear Inequalities	Students solve one-step inequalities algebraically. The inequalities include all four operations but are restricted to positive integers.	7.EE.4b		✓										



3 Reasoning Algebraically		Strategies													
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<b>Solving Two-Step Inequalities (continued)</b>	Solving Two-Step Linear Inequalities	Students solve two-step linear inequalities.	7.EE.4b		✓				•					•	
<b>Problem Solving with Two-Step Equations and Inequalities</b>	Determining the Value of an Independent Variable	Students start with a scenario, a table, and a graph to determine the value of an independent variable given the value of the dependent variable.	7.EE.4a	✓						•			•		•
	Using Linear Equations and Inequalities	Students write equations and inequalities to represent problem situations. Students solve and interpret the solutions to the equations and inequalities in the context of the problem.	7.EE.3 7.EE.4		✓								•	•	
	Solving Problems with Integers	Students write algebraic expressions involving integers to represent problem scenarios and to determine output values. Students solve equations to determine input values.	7.EE.3 7.EE.4a		✓						•		•	•	
	Solving Problems with Decimals and Fractions	Students write algebraic expressions involving decimals and fractions to represent problem scenarios and to determine output values. Students solve equations to determine input values.	7.EE.3 7.EE.4a		✓						•		•	•	
<b>The Coordinate Plane and Two-Step Equations</b>	Graphs of Equations	Students model and analyze the graphs of linear equations. Students identify key characteristics of the graphs and use them to interpret problem situations.	7.EE.4a	✓									•	•	•
	Using Graphs to Solve Equations	Students watch an animation as they learn how to model the solution of a linear equation graphically. Students practice solving problems by modeling linear equations.	7.EE.4a	✓		•							•		

4 Analyzing Populations and Probabilities		Strategies													
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Introduction to Probability															
Introduction to Probability	Determining Probabilities	Students build probability models and determine probabilities of simple and disjoint events. They use proportions to make predictions based on samples and theoretical probabilities.	7.SP.C.5 7.SP.C.7a	✓											
	Comparing Experimental and Theoretical Probabilities	Students examine data from probability experiments and compare with theoretical probabilities. They use results of probability experiments to make conjectures about theoretical probabilities.	7.SP.C.6 7.SP.C.7b	✓											
	Simulating Simple Events	Students use simulations to model real-world scenarios.	7.SP.8c	✓											

Compound Probability															
Compound Probability	Introduction to Compound Events	Students will extend what they know about simple events to compound events in the context of the game “Rock, Paper, Scissors.”	7.SP.8a	✓											
	Calculating Compound Probabilities	Students use simulation, tree diagrams, organized lists, and tables to determine compound probabilities.	7.SP.C.8b	✓											
	Simulating Compound Events	Students will use random number tables to simulate compound events and make inferences about those events.	7.SP.8c	✓											

4 Analyzing Populations and Probabilities		Strategies												
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Drawing Inferences														
Numerical Data Displays Comparisons	Using Statistics to Draw Inferences About a Population	In this workspace, students will learn how to discriminate between scenarios that belong to a sample versus a population, understand that random sampling tends to produce valid inferences, develop an informal understanding of bias, and see how conclusions about a population are valid only if the sample is representative of that population.	7.SP.1 7.SP.2	✓										
	Comparing Characteristics of Data Displays	Students compare the characteristics of data displays, specifying which numerical characteristics can be determined from each display.	7.SP.3		✓									
	Comparing Populations using Data Displays	Students use data displays to compare populations by determining the visual overlap and describing the difference between the measures of centers in terms of measures of variability.	7.SP.3		✓									

5		Constructing and Measuring				Strategies											
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Angles and Triangles																	
Angle Properties	Calculating Angles	Students use an interactive circular protractor to measure angles and determine angle sums.	7.G.5	✓													
	Classifying Angles and Determining Unknown Measures	Students identify complementary, supplementary, and vertical angles. They write and solve equations to solve for unknown angle measures.	7.G.5	✓													

Three-Dimensional Figures																	
Three Dimensional Figures	Visualizing Cross Sections of Three-Dimensional Shapes	Students watch an animation showing two different intersections of a plane and a solid. They then describe cross-sections of different solids given the intersection of a plane. Finally, students identify the solid from a given cross-section.	7.G.3	✓													
Volume of Prisms and Pyramids	Understanding Volume Formulas for Right Prisms	Students relate the variables in the volume formula for a right prism to measurements shown in a diagram. of a triangular prism. They map the parts of a triangular prism to the variables in the volume formula for a right prism. They then reason about how to determine an unknown measurement of a triangular prism given its volume.	7.G.6	✓													
	Using Volume of Right Prisms	Students use the volume of right prisms to solve for unknown values.	7.G.6		✓												
	Calculating Volume of Pyramids	Students calculate the volume of pyramids in mathematical and real-world contexts using given measurements.	7.G.6		✓												
	Using Volume of Pyramids	Students apply their reasoning to determine volume of pyramids and solve volume problems.	7.G.6		✓												