

Eureka Math² Year at a Glance



7: Ratios and Proportionality

Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
Ratios and Proportional Relationships	Operations with Rational Numbers	Expressions, Equations, and Inequalities	Geometry	Percent and Applications of Percent	Probability and Populations
<p>Topic A: Understanding Proportional Relationships</p> <p>Lesson 1: An Experiment with Ratios and Rates</p> <ul style="list-style-type: none"> Compare different relationships in situations by using ratio and rate reasoning. <p>7.RP.A.1, 7.RP.A.2.a, MP8, 7.Mod1.AD1, 7.Mod1.AD2</p> <p>Lesson 2: Exploring Tables of Proportional Relationships</p> <ul style="list-style-type: none"> Identify proportional relationships represented in tables by calculating constant unit rates. <p>7.RP.A.1, 7.RP.A.2.a, 7.RP.A.2.c, MP2, 7.Mod1.AD1, 7.Mod1.AD2, 7.Mod1.AD4</p> <p>Lesson 3: Identifying Proportional Relationships in Tables</p> <ul style="list-style-type: none"> Analyze tables to identify proportional relationships. Determine the unit rate associated with a ratio of fractions by evaluating a complex fraction. 	<p>Topic A: Adding Rational Numbers</p> <p>Lesson 1: Combining Opposites</p> <ul style="list-style-type: none"> Represent positive and negative numbers on a number line. Recognize that opposite integers sum to zero. <p>7.NS.A.1.a, 7.NS.A.1.b, MP8, 7.Mod2.AD2, 7.Mod2.AD4</p> <p>Lesson 2: Adding Integers</p> <ul style="list-style-type: none"> Write addition expressions involving integers. Add integers by using a model. <p>7.NS.A.1.b, MP8, 7.Mod2.AD3</p> <p>Lesson 3: Adding Integers Efficiently</p> <ul style="list-style-type: none"> Describe a number and its opposite as additive inverses because they sum to zero. Evaluate addition expressions with two or more addends. <p>7.NS.A.1.b, MP8, 7.Mod2.AD3, 7.Mod2.AD4, 7.Mod2.AD5</p> <p>Lesson 4: KAKOOMA®</p>	<p>Topic A: Equivalent Expressions</p> <p>Lesson 1: Equivalent Expressions</p> <ul style="list-style-type: none"> Generate equivalent expressions by using properties of operations. <p>7.EE.A.1, MP3, 7.Mod3.AD1</p> <p>Lesson 2: The Distributive Property and the Tabular Model</p> <ul style="list-style-type: none"> Generate equivalent expressions containing rational numbers by using the tabular model to represent the distributive property. <p>7.EE.A.1, 7.EE.A.2, MP3, 7.Mod3.AD1, 7.Mod3.AD2</p> <p>Lesson 3: The Distributive Property and Combining Like Terms</p> <ul style="list-style-type: none"> Generate equivalent expressions by applying the distributive property to combine like terms. <p>7.EE.A.1, MP6, 7.Mod3.AD1</p> <p>Lesson 4: Adding and Subtracting Expressions</p>	<p>Topic A: Constructing Geometric Figures</p> <p>Lesson 1: Sketching, Drawing, and Constructing Geometric Figures</p> <ul style="list-style-type: none"> Construct geometric figures with given conditions. Construct geometric figures by using technology. <p>7.G.A.2, MP5, 7.Mod4.AD1</p> <p>Lesson 2: Constructing Parallelograms and Other Quadrilaterals</p> <ul style="list-style-type: none"> Construct parallelograms and other quadrilaterals, given conditions. <p>7.G.A.2, MP6, 7.Mod4.AD1</p> <p>Lesson 3: Side Lengths of a Triangle</p> <ul style="list-style-type: none"> Determine whether a triangle with three given side lengths exists. Determine the relationship between the sum of two side lengths of a triangle and its third side length. <p>7.G.A.2, MP2, 7.Mod4.AD1, 7.Mod4.AD2</p>	<p>Topic A: Proportion and Percent</p> <p>Lesson 1: Proportionality and Scale Factor</p> <ul style="list-style-type: none"> Identify the scale factor of cross sections. <p>7.G.A.1, 7.RP.A.2.c, MP8, 7.Mod5.AD2, 7.Mod5.AD7</p> <p>Lesson 2: Racing of Percents</p> <ul style="list-style-type: none"> Identify proportional relationships and write the constant of proportionality as a percent. Identify percent as a rate per 100. <p>7.RP, 7.RP.A.3, MP7, 7.Mod5.AD1, 7.Mod5.AD3</p> <p>Lesson 3: Percent as a Rate per 100</p> <ul style="list-style-type: none"> Interpret percent as a rate per 100 when solving percent problems. <p>7.RP.A.3, MP5, 7.Mod5.AD3</p> <p>Lesson 4: Proportion and Percent</p> <ul style="list-style-type: none"> Solve percent problems by using equations in the forms $y = kx$ and $\frac{a}{b} = \frac{c}{d}$. <p>7.RP.A.2.c, 7.RP.A.3, MP3, 7.Mod5.AD2, 7.Mod5.AD3</p>	<p>Topic A: Calculating and Interpreting Probabilities</p> <p>Lesson 1: What Is Probability?</p> <ul style="list-style-type: none"> Find a number between 0 and 1 that represents the likelihood that an event will occur. <p>7.SP.C.5, MP2, 7.Mod6.AD5</p> <p>Lesson 2: Empirical Probability</p> <ul style="list-style-type: none"> Calculate empirical probabilities by collecting data from a chance experiment. <p>7.SP.C.6, MP6, 7.Mod6.AD6</p> <p>Lesson 3: Outcomes of Chance Experiments</p> <ul style="list-style-type: none"> Determine the sample space for chance experiments. Given a description of a chance experiment and an event, determine for which outcomes in the sample space the event will occur. <p>7.SP.C.6, MP2, 7.Mod6.AD6</p> <p>Lesson 4: Theoretical Probability</p> <ul style="list-style-type: none"> Calculate theoretical probabilities of events for chance experiments that have equally likely outcomes. <p>7.SP.C.7.a, MP6, 7.Mod6.AD8</p>

<p>7.RP.A.1, 7.RP.A.2.a, 7.RP.A.2.c, MP8, 7.Mod1.AD1, 7.Mod1.AD2, 7.Mod1.AD4</p> <p>Lesson 4: Exploring Graphs of Proportional Relationships</p> <ul style="list-style-type: none"> Identify proportional relationships represented as graphs. Interpret and makes sense of the point $(0, 0)$ in context. <p>7.RP.A.2.a, 7.RP.A.2.b, 7.RP.A.2.d, MP8, 7.Mod1.AD2, 7.Mod1.AD3, 7.Mod1.AD5</p> <p>Lesson 5: Analyzing Graphs of Proportional Relationships</p> <ul style="list-style-type: none"> Analyze graphs or sets of ratios to determine whether they represent proportional relationships. Identify the point on a graph that best shows the constant of proportionality k and explain the meaning of the point in context. <p>7.RP.A.2.a, 7.RP.A.2.b, 7.RP.A.2.d, MP2, 7.Mod1.AD2, 7.Mod1.AD3, 7.Mod1.AD5</p> <p>Lesson 6: Identifying Proportional Relationships in Written Descriptions</p> <ul style="list-style-type: none"> Determine whether a written description represents a proportional relationship. <p>7.RP.A.2.a, 7.RP.A.2.b, MP2, 7.Mod1.AD2, 7.Mod1.AD3</p> <hr/> <p>Topic B: Working with Proportional Relationships</p> <p>Lesson 7: Handstand Sprint</p>	<ul style="list-style-type: none"> Add integers to solve and create puzzles. <p>7.NS.A.1.d, MP1, 7.Mod2.AD8</p> <p>Lesson 5: Decomposing Rational Numbers to Make Addition More Efficient</p> <ul style="list-style-type: none"> Add rational numbers by decomposing them. <p>7.NS.A.1.b, 7.NS.A.1.d, MP3, 7.Mod2.AD3, 7.Mod2.AD8</p> <p>Lesson 6: Adding Rational Numbers</p> <ul style="list-style-type: none"> Fluently add rational numbers. <p>7.NS.A.1.b, 7.NS.A.1.d, MP5, 7.Mod2.AD3, 7.Mod2.AD8</p> <hr/> <p>Topic B: Subtracting Rational Numbers</p> <p>Lesson 7: What Subtraction Means</p> <ul style="list-style-type: none"> Show that the distance between two integers on the number line is the absolute value of their difference. Evaluate integer subtraction expressions by finding the unknown addends. <p>7.NS.A.1.c, MP7, 7.Mod2.AD7</p> <p>Lesson 8: Subtracting Integers, Part 1</p> <ul style="list-style-type: none"> Use expressions, number lines, and patterns to model contextual problems involving subtraction. Write subtraction expressions as equivalent addition expressions. <p>7.NS.A.1.b, 7.NS.A.1.c, MP2, 7.Mod2.AD5, 7.Mod2.AD6</p> <p>Lesson 9: Subtracting Integers, Part 2</p> <ul style="list-style-type: none"> Express subtraction of a number as addition of its opposite. 	<ul style="list-style-type: none"> Generate equivalent expressions by using properties of operations to add and subtract expressions. <p>7.EE.A.1, 7.EE.A.2, MP7, 7.Mod3.AD1, 7.Mod3.AD2</p> <p>Lesson 5: Factoring Expressions</p> <ul style="list-style-type: none"> Generate equivalent expressions by using the distributive property to factor. <p>7.EE.A.1, 7.EE.A.2, MP2, 7.Mod3.AD1, 7.Mod3.AD2</p> <p>Lesson 6: Comparing Expressions</p> <ul style="list-style-type: none"> Use properties of operations to determine whether expressions are equivalent. <p>7.EE.A.1, 7.EE.A.2, MP7, 7.Mod3.AD1, 7.Mod3.AD2</p> <hr/> <p>Topic B: Unknown Angle Measurements</p> <p>Lesson 7: Angle Relationships and Unknown Angle Measures</p> <ul style="list-style-type: none"> Identify and describe angle relationships given in diagrams. Write and solve equations that use angle relationships to find unknown angle measures. <p>7.G.B.5, 7.EE.B.4.a, MP5, 7.Mod3.AD8, 7.Mod3.AD12</p> <p>Lesson 8: Strategies to Determine Unknown Angle Measures</p> <ul style="list-style-type: none"> Identify and describe angle relationships given in diagrams. Write and solve two-step equations that use angle relationships to find unknown angle measures. <p>7.G.B.5, 7.EE.B.4.a, MP6, 7.Mod3.AD8, 7.Mod3.AD12</p>	<p>Lesson 4: Angles of a Triangle</p> <ul style="list-style-type: none"> Determine whether a triangle can be formed with two given angle measures. <p>7.G.A.2, MP3, 7.Mod4.AD1, 7.Mod4.AD2</p> <p>Lesson 5: Constructing Quadrilaterals and Triangles</p> <ul style="list-style-type: none"> Construct quadrilaterals given four side lengths and determine whether a unique quadrilateral is formed. Construct triangles given three side lengths and determine whether a unique triangle is formed. <p>7.G.A.2, MP8, 7.Mod4.AD1, 7.Mod4.AD2</p> <hr/> <p>Topic B: Constructing Triangles</p> <p>Lesson 6: Unique Triangles</p> <ul style="list-style-type: none"> Determine that at least three conditions are needed to guarantee a unique triangle. Determine that three angle measures alone do not guarantee a unique triangle. <p>7.G.A.2, MP3, 7.Mod4.AD1, 7.Mod4.AD2</p> <p>Lesson 7: Two Angles and One Side</p> <ul style="list-style-type: none"> Determine whether two angle measures and an included side length guarantee a unique triangle. Determine whether two angle measures and a non-included side length guarantee a unique triangle. <p>7.G.A.2, MP3, 7.Mod4.AD1, 7.Mod4.AD2</p>	<p>Lesson 5: Common Denominators or Common Numerators</p> <ul style="list-style-type: none"> Solve percent problems by using strategies that involve finding common denominators or common numerators to solve proportions. <p>7.RP.A.2.c, 7.RP.A.3, MP5, 7.Mod5.AD2, 7.Mod5.AD3</p> <hr/> <p>Topic B: Part of 100</p> <p>Lesson 6: Finding Commission</p> <ul style="list-style-type: none"> Apply percents in the real-world context of commission. <p>7.RP.A.3, MP1, 7.Mod5.AD3, 7.Mod5.AD4</p> <p>Lesson 7: Finding Discounts</p> <ul style="list-style-type: none"> Apply percents in the real-world context of discounts. <p>7.RP, 7.RP.A.3, MP1, 7.Mod5.AD1, 7.Mod5.AD3, 7.Mod5.AD4</p> <p>Lesson 8: Determining Fees</p> <ul style="list-style-type: none"> Apply percents in the real-world context of fees. <p>7.RP.A.3, MP3, 7.Mod5.AD3, 7.Mod5.AD4</p> <p>Lesson 9: Tax as a Fee</p> <ul style="list-style-type: none"> Apply percents in the real-world context of taxes. <p>7.RP.A.3, MP1, 7.Mod5.AD3, 7.Mod5.AD4</p> <hr/> <p>Topic C: More or Less Than 100%</p> <p>Lesson 10: Percent Increase</p>	<p>Lesson 5: Multistage Experiments</p> <ul style="list-style-type: none"> Use tree diagrams to organize and represent the outcomes in the sample space of a multistage experiment. <p>7.SP.C.8.a, 7.SP.C.8.b, MP7, 7.Mod6.AD10</p> <p>Lesson 6: Outcomes That Are Not Equally Likely</p> <ul style="list-style-type: none"> Calculate probabilities of events for chance experiments that do not have equally likely outcomes. <p>7.SP.C.6, MP7, 7.Mod6.AD6</p> <hr/> <p>Topic B: Estimating Probabilities</p> <p>Lesson 7: The Law of Large Numbers</p> <ul style="list-style-type: none"> Use empirical probability to estimate theoretical probability. Compare probabilities from a theoretical model to observed relative frequencies. <p>7.SP.C.7, 7.SP.C.7.a, 7.SP.C.7.b, MP8, 7.Mod6.AD7, 7.Mod6.AD8, 7.Mod6.AD9</p> <p>Lesson 8: Picking Blue</p> <ul style="list-style-type: none"> Use empirical probabilities to create a probability model. <p>7.SP.C.6, 7.SP.C.7.b, MP2, 7.Mod6.AD6, 7.Mod6.AD9</p> <p>Lesson 9: Probability Simulations</p> <ul style="list-style-type: none"> Use a simulation to generate empirical probabilities for events. <p>7.SP.C.8.c, MP1, 7.Mod6.AD11</p> <p>Lesson 10: Simulations with Random Number Tables</p> <ul style="list-style-type: none"> Conduct simulations with a random number table.
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<ul style="list-style-type: none"> Model a situation by using a proportional relationship to solve a problem. <p>7.RP.A.3, MP4, MP5, 7.Mod1.AD6</p> <p>Lesson 8: Relating Representations of Proportional Relationships</p> <ul style="list-style-type: none"> Relate information among tables, graphs, equations, and situations to display a proportional relationship. Identify the constant of proportionality in different representations of a proportional relationship. <p>7.RP.A.2.b, 7.RP.A.2.c, MP7, 7.Mod1.AD3, 7.Mod1.AD4</p> <p>Lesson 9: Comparing Proportional Relationships</p> <ul style="list-style-type: none"> Explain how to use the point $(1, r)$ to find the unit rate of a proportional relationship. Relate the unit rate to the steepness of the line representing the proportional relationship by using the unit rate triangle with vertices $(0, 0)$, $(1, 0)$, and $(1, r)$. <p>7.RP.A.2.b, 7.RP.A.2.d, MP7, 7.Mod1.AD3, 7.Mod1.AD5</p> <p>Lesson 10: Applying Proportional Reasoning</p> <ul style="list-style-type: none"> Represent proportional relationships as equations. Solve problems by applying proportional reasoning. <p>7.RP.A.2.c, 7.RP.A.3, MP2, 7.Mod1.AD4, 7.Mod1.AD6</p> <p>Lesson 11: Constant Rates</p> <ul style="list-style-type: none"> Represent rate problems as proportional relationships with equations. Solve rate problems. 	<ul style="list-style-type: none"> Subtract integers by using equivalent addition expressions. <p>7.NS.A.1.c, 7.NS.A.1.d, MP8, 7.Mod2.AD6, 7.Mod2.AD8</p> <p>Lesson 10: Subtracting Rational Numbers, Part 1</p> <ul style="list-style-type: none"> Evaluate expressions involving subtraction of rational numbers. Use properties of operations to make a simpler expression. <p>7.NS.A.1.c, 7.NS.A.1.d, MP7, 7.Mod2.AD6, 7.Mod2.AD8</p> <p>Lesson 11: Subtracting Rational Numbers, Part 2</p> <ul style="list-style-type: none"> Subtract rational numbers by writing equivalent addition expressions and evaluating them. Use properties of operations to make a simpler expression. <p>7.NS.A.1.c, 7.NS.A.1.d, MP1, 7.Mod2.AD6, 7.Mod2.AD8</p> <p>Lesson 12: The Integer Game</p> <ul style="list-style-type: none"> Apply strategies of integer addition and subtraction. Recognize when opposites combine to make zero. <p>7.NS.A.1.a, 7.NS.A.1.d, MP6, 7.Mod2.AD2, 7.Mod2.AD8</p> <p>Topic C: Multiplying Rational Numbers</p> <p>Lesson 13: Understanding Multiples of Negative Numbers</p> <ul style="list-style-type: none"> Interpret multiplication as repeated addition by using the distributive property. Informally verify that multiplying two numbers with opposite signs results in a negative product. 	<p>Lesson 9: Solving Equations to Determine Unknown Angle Measures</p> <ul style="list-style-type: none"> Identify and describe angle relationships given in diagrams. Write and solve two-step equations that use angle relationships to find unknown angle measures. <p>7.EE.A.2, 7.EE.B.3, MP7, 7.Mod3.AD2, 7.Mod3.AD3</p> <p>Lesson 10: Problem Solving with Unknown Angle Measures</p> <ul style="list-style-type: none"> Solve multi-step problems to determine unknown angle measures by using all known angle relationships. <p>7.EE.B.3, 7.G.B.5, MP1, 7.Mod3.AD3, 7.Mod3.AD12</p> <p>Topic C: Solving Equations</p> <p>Lesson 11: Dominoes and Dominoes</p> <ul style="list-style-type: none"> Compare different ways of solving a problem. Use equations as mathematical models to estimate the number of dominoes in a tower. <p>7.EE.B.3, 7.EE.B.4, MP1, MP4, 7.Mod3.AD3, 7.Mod3.AD4, 7.Mod3.AD5</p> <p>Lesson 12: Solving Problem Algebraically and Arithmetically</p> <ul style="list-style-type: none"> Use if–then moves to solve word problems leading to equations of the forms $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. 	<p>Lesson 8: Two Sides and One Angle</p> <ul style="list-style-type: none"> Determine whether two side lengths and an included angle measure guarantee a unique triangle. Determine whether two side lengths and a non-included angle measure guarantee a unique triangle. <p>7.G.A.2, MP8, 7.Mod4.AD1, 7.Mod4.AD2</p> <p>Topic C: Circumference and Area of Circles</p> <p>Lesson 9: Constructing a Circle</p> <ul style="list-style-type: none"> Define and construct circles given a radius or a diameter. <p>7.G.A.2, MP6, 7.Mod4.AD1</p> <p>Lesson 10: The Outside of a Circle</p> <ul style="list-style-type: none"> Describe the relationship between the circumference and diameter of any circle as a proportional relationship. Find the approximate circumference of a circle by using the value 3.1 as the constant of proportionality. <p>7.G.B.4, MP8, 7.Mod4.AD4</p> <p>Lesson 11: The Inside of a Circle</p> <ul style="list-style-type: none"> Estimate the area of a circle. <p>7.G.B.4, MP7, 7.Mod4.AD4</p> <p>Lesson 12: Exploring the Area and Circumference of a Circle</p> <ul style="list-style-type: none"> Model and describe the relationship between the circumference and the area of a circle. <p>7.G.B.4, MP7, 7.Mod4.AD4, 7.Mod4.AD5</p>	<ul style="list-style-type: none"> Solve percent problems in a real-world context that involves percent increase. <p>7.RP.A.3, 7.EE.A.2, MP2, 7.Mod5.AD4, 7.Mod5.AD5, 7.Mod5.AD6</p> <p>Lesson 11: Percent Decrease</p> <ul style="list-style-type: none"> Solve percent problems in a real-world context that involves percent decrease. <p>7.RP.A.3, 7.EE.A.2, MP2, 7.Mod5.AD4, 7.Mod5.AD5, 7.Mod5.AD6</p> <p>Lesson 12: More Discounts</p> <ul style="list-style-type: none"> Use equations to solve percent problems that involve the real-world context of discounts. <p>7.RP.A.3, 7.EE.A.2, MP6, 7.Mod5.AD4, 7.Mod5.AD5, 7.Mod5.AD6</p> <p>Lesson 13: What Is the Best Deal?</p> <ul style="list-style-type: none"> Use equations to calculate multiple discounts and discounted prices. <p>7.RP.A.3, MP1, MP2, 7.Mod5.AD4</p> <p>Lesson 14: Scale Factor—Percent Increase and Decrease</p> <ul style="list-style-type: none"> Apply scale factor expressed as a percent, a percent decrease, or a percent increase. Construct a scale drawing by using a scale factor given as a percent, a percent decrease, or a percent increase. <p>7.RP, 7.EE.A.2, 7.G.A.1, MP1, 7.Mod5.AD1, 7.Mod5.AD6, 7.Mod5.AD7</p> <p>Topic D: Applications of Percent</p>	<p>7.SP.C.8.c, MP5, 7.Mod6.AD11</p> <p>Topic C: Random Sampling</p> <p>Lesson 11: Populations and Samples</p> <ul style="list-style-type: none"> Distinguish populations and their characteristics from samples and their statistics. <p>7.SP.A.1, MP6, 7.Mod6.AD1</p> <p>Lesson 12: Selecting a Sample</p> <ul style="list-style-type: none"> Take a random sample from a population. Describe the importance of a random sample in drawing conclusions about a population. <p>7.SP.A.1, MP2, 7.Mod6.AD1</p> <p>Lesson 13: Variability Between Samples</p> <ul style="list-style-type: none"> Observe the variability between different random samples taken from the same population. <p>7.SP.A.1, 7.SP.A.2, MP6, 7.Mod6.AD1, 7.Mod6.AD2</p> <p>Lesson 14: Sampling Variability When Estimating a Population Mean</p> <ul style="list-style-type: none"> Describe sampling variability in the context of estimating a population mean. Use data from a random sample to estimate a population mean. <p>7.SP.A.1, 7.SP.A.2, MP2, 7.Mod6.AD1, 7.Mod6.AD2</p> <p>Lesson 15: Sampling Variability and the Effect of Sample Size</p> <ul style="list-style-type: none"> Observe that increasing the sample size decreases the sampling variability of the sample mean. <p>7.SP.A.2, MP1, 7.Mod6.AD2</p>
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<p>7.RP.A.2.b, 7.RP.A.2.c, 7.RP.A.3, MP1, 7.Mod1.AD3, 7.Mod1.AD4, 7.Mod1.AD6</p> <p>Lesson 12: Multi-Step Ratio Problems, Part 1</p> <ul style="list-style-type: none"> Solve multi-step ratio problems by using proportional reasoning. <p>7.RP.A.2.b, 7.RP.A.2.c, 7.RP.A.3, MP7, 7.Mod1.AD3, 7.Mod1.AD4, 7.Mod1.AD6</p> <p>Lesson 13: Multi-Step Ratio Problems, Part 2</p> <ul style="list-style-type: none"> Solve multi-step ratio problems by using proportional reasoning. <p>7.RP.A.2.b, 7.RP.A.2.c, 7.RP.A.3, MP5, 7.Mod1.AD3, 7.Mod1.AD4, 7.Mod1.AD6</p> <hr/> <p>Topic C: Scale Drawings and Proportional Relationships</p> <p>Lesson 14: Extreme Bicycles</p> <ul style="list-style-type: none"> Compare objects of different sizes by using proportional reasoning. <p>7.RP.A.2.a, MP1, MP5, 7.Mod1.AD2</p> <p>Lesson 15: Scale Drawings</p> <ul style="list-style-type: none"> Determine one-to-one correspondence of points in related figures. Recognize that corresponding lengths in scale drawings are in a proportional relationship with a constant of proportionality called a scale factor. <p>7.GA.1, MP7, 7.Mod1.AD7</p> <p>Lesson 16: Using a Scale Factor</p> <ul style="list-style-type: none"> Determine whether a scale factor produces an enlargement or a reduction. 	<p>7.NS.A.2.a, 7.NS.A.2.c, MP2, 7.Mod2.AD9, 7.Mod2.AD12</p> <p>Lesson 14: Understanding the Product of Two Negative Numbers</p> <ul style="list-style-type: none"> Informally verify that multiplying two numbers with the same sign results in a positive product. Predict the sign of a product with multiple factors. <p>7.NS.A.2.a, 7.NS.A.2.c, MP3, 7.Mod2.AD9, 7.Mod2.AD11, 7.Mod2.AD12</p> <p>Lesson 15: Multiplying Rational Numbers</p> <ul style="list-style-type: none"> Extend knowledge of multiplying integers to multiply rational numbers. <p>7.NS.A.2.a, 7.NS.A.2.c, MP7, 7.Mod2.AD9, 7.Mod2.AD12</p> <p>Lesson 16: Exponential Expressions with Rational Numbers</p> <ul style="list-style-type: none"> Extend knowledge of multiplying integers to multiply rational numbers in all forms. Evaluate exponential expressions containing rational bases. <p>7.NS.A.2.a, 7.NS.A.2.c, MP6, 7.Mod2.AD9, 7.Mod2.AD12</p> <hr/> <p>Topic D: Dividing Rational Numbers</p> <p>Lesson 17: Understanding Negative Dividends</p> <ul style="list-style-type: none"> Model division and recognize limitations of the models when dividing integers. <p>7.NS.A.2.c, MP7, 7.Mod2.AD12</p>	<p>7.EE.B.4, 7.EE.B.4.a, MP2, 7.Mod3.AD5, 7.Mod3.AD7, 7.Mod3.AD8</p> <p>Lesson 13: Solving Equations—Puzzles</p> <ul style="list-style-type: none"> Use if–then moves to solve equations of the forms $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. <p>7.EE.B.4, 7.EE.B.4.a, MP7, 7.Mod3.AD5, 7.Mod3.AD7</p> <p>Lesson 14: Solving Equations—Scavenger Hunt</p> <ul style="list-style-type: none"> Solve equations of the forms $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. <p>7.EE.B.4.a, MP7, 7.Mod3.AD7</p> <p>Lesson 15: Solving Equations Fluently</p> <ul style="list-style-type: none"> Fluently solve equations of the forms $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. <p>7.EE.B.4.a, MP1, 7.Mod3.AD7</p> <p>Lesson 16: Using Equations to Solve Rate Problems</p> <ul style="list-style-type: none"> Create and solve word problems containing rates by using equations of the forms $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. <p>7.EE.B.3, 7.EE.B.4, 7.EE.B.4.a, MP2, 7.Mod3.AD3, 7.Mod3.AD5, 7.Mod3.AD8</p> <p>Lesson 17: Using Equations to Solve Problems</p> <ul style="list-style-type: none"> Write and solve equations in the form $\frac{a}{b} = \frac{c}{d}$, where either a, b, c, or d is 	<p>Lesson 13: Finding Areas of Circular Regions</p> <ul style="list-style-type: none"> Solve problems by using the formula for the area of a circle. Model and describe the relationship between the areas of circles and the areas of semicircular and quarter-circular regions. <p>7.G.B.4, MP7, 7.Mod4.AD4, 7.Mod4.AD5</p> <p>Lesson 14: Composite Figures with Circular Regions</p> <ul style="list-style-type: none"> Solve problems involving area and perimeter of composite figures. <p>7.G.B.4, 7.G.B.6, MP7, 7.Mod4.AD4, 7.Mod4.AD6</p> <p>Lesson 15: Watering a Lawn</p> <ul style="list-style-type: none"> Model a situation by using rectangular, circular, semicircular, and quarter-circular regions and calculate area to solve problems. <p>7.G.B.4, MP1, MP4, 7.Mod4.AD4</p> <hr/> <p>Topic D: Area and Surface Area</p> <p>Lesson 16: Solving Area Problems by Composition and Decomposition</p> <ul style="list-style-type: none"> Calculate the area of composite figures in real-world and mathematical problems by using composition and decomposition. <p>7.G.B.6, MP1, 7.Mod4.AD6</p> <p>Lesson 17: Surface Area of Right Rectangular and Right Triangular Prisms</p> <ul style="list-style-type: none"> Calculate the surface area of right rectangular and right triangular prisms. 	<p>Lesson 15: Tips and Taxes</p> <ul style="list-style-type: none"> Calculate percent increases such as tax and tip. Calculate the total from the subtotal, tax, and tip. <p>7.RP.A.3, 7.EE.A.2, MP7, 7.Mod5.AD4, 7.Mod5.AD5, 7.Mod5.AD6</p> <p>Lesson 16: Markups and Discounts</p> <ul style="list-style-type: none"> Determine retail prices by using markups. Determine discounted prices by using discounts. <p>7.RP.A.3, 7.EE.A.2, MP7, 7.Mod5.AD4, 7.Mod5.AD5, 7.Mod5.AD6</p> <p>Lesson 17: Simple Interest and Proportionality</p> <ul style="list-style-type: none"> Calculate simple interest given principal, time, and interest rate. <p>7.RP.A.3, MP7, 7.Mod5.AD4</p> <p>Lesson 18: Simple Interest—Solving for Unknown Values</p> <ul style="list-style-type: none"> Calculate simple interest, principal, time, and interest rate. <p>7.RP.A.3, MP8, 7.Mod5.AD4</p> <p>Lesson 19: Applying Percent Error</p> <ul style="list-style-type: none"> Use absolute error to define percent error. Apply percent error to real-world contexts. <p>7.RP.A.3, MP2, 7.Mod5.AD4</p> <hr/> <p>Topic E: Problems Involving Percent</p> <p>Lesson 20: Making Money, Day 1</p>	<p>Lesson 16: Sampling Variability When Estimating a Population Proportion</p> <ul style="list-style-type: none"> Observe that increasing the sample size decreases the sampling variability of the sample proportion. <p>7.SP.A.2, MP6, 7.Mod6.AD2</p> <hr/> <p>Topic D: Comparing Populations</p> <p>Lesson 17: Comparing Sample Means</p> <ul style="list-style-type: none"> Determine whether there is convincing evidence to conclude that two population means differ based on sample estimates. <p>7.SP.B.3, 7.SP.B.4, MP3, 7.Mod6.AD3, 7.Mod6.AD4</p> <p>Lesson 18: Comparing Population Means</p> <ul style="list-style-type: none"> Express the difference in sample means as a multiple of a measure of variability. <p>7.SP.B.3, 7.SP.B.4, MP7, 7.Mod6.AD3, 7.Mod6.AD4</p> <p>Lesson 19: Memory Games</p> <ul style="list-style-type: none"> Make conclusions about a difference in population means by using sample means and mean absolute deviations. <p>7.SP.B.3, 7.SP.B.4, MP4, 7.Mod6.AD3, 7.Mod6.AD4</p>
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<ul style="list-style-type: none"> • Create a scale drawing by using the proportional relationship that exists between corresponding distances. 7.G.A.1, 7.RP.A.2.a, 7.RP.A.2.b, MP3, 7.Mod1.AD3, 7.Mod1.AD7, 7.Mod1.AD8 <p>Lesson 17: Finding Actual Distances from a Scale Drawing</p> <ul style="list-style-type: none"> • Find measurements of a figure when given a scale factor and either the scale drawing or the original figure. 7.G.A.1, MP6, 7.Mod1.AD8 <p>Lesson 18: Relating Areas of Scale Drawings</p> <ul style="list-style-type: none"> • Describe the area of a scale drawing with scale factor r as r^2 times the area of the original figure. 7.G.A.1, 7.RP.A.2.b, MP8, 7.Mod1.AD3, 7.Mod1.AD8 <p>Lesson 19: Scale and Scale Factors</p> <ul style="list-style-type: none"> • Describe the difference between a scale and a scale factor. • Find unknown measurements in scale drawings through the appropriate use of scales and scale factors. 7.G.A.1, MP4, 7.Mod1.AD7, 7.Mod1.AD8 <p>Lesson 20: Creating Multiple Scale Drawings</p> <ul style="list-style-type: none"> • Draw a scale drawing of another scale drawing by using a new scale factor. • Write an equation for the proportional relationship relating scale drawings that have different scale factors and use the equation to find unknown distances. 7.G.A.1, MP3, 7.Mod1.AD7, 7.Mod1.AD8 	<p>Lesson 18: Understanding Negative Divisors</p> <ul style="list-style-type: none"> • Write division expressions as unknown factor equations to determine the value of the quotient. • Write rational numbers as quotients of integers. 7.NS.A.2.b, 7.NS.A.2.c, MP7, 7.Mod2.AD10, 7.Mod2.AD12 <p>Lesson 19: Rational Numbers as Decimals, Part 1</p> <ul style="list-style-type: none"> • Calculate quotients of integers where the divisor is a product of 2's and/or 5's and express them as terminating decimals. 7.NS.A.2.d, MP8, 7.Mod2.AD13 <p>Lesson 20: Rational Numbers as Decimals, Part 2</p> <ul style="list-style-type: none"> • Calculate quotients where the divisor contains factors other than 2 and 5 and express those quotients as repeating decimals. • Write rational numbers as either terminating decimals or repeating decimals. 7.NS.A.2.d, MP8, 7.Mod2.AD13, 7.Mod2.AD14 <p>Lesson 21: Comparing and Ordering Rational Numbers</p> <ul style="list-style-type: none"> • Compare and order rational numbers, including those written as repeating decimals. 7.NS.A.2.b, 7.NS.A.2.d, MP5, 7.Mod2.AD11, 7.Mod2.AD13, 7.Mod2.AD14 <p>Lesson 22: Multiplication and Division Expressions</p> <ul style="list-style-type: none"> • Calculate quotients of rational numbers, including non-integer rational numbers. 	<p>unknown and the other three are specific rational numbers. 7.EE.B.3, 7.EE.B.4, MP7, 7.Mod3.AD3, 7.Mod3.AD4, 7.Mod3.AD5</p> <hr/> <p>Topic D: Inequalities</p> <p>Lesson 18: Understanding Inequalities and Their Solutions</p> <ul style="list-style-type: none"> • Find solutions to inequalities by testing numbers and graphing them on a number line. 7.EE.B.4, 7.EE.B.4.b, MP6, 7.Mod3.AD6, 7.Mod3.AD10, 7.Mod3.AD11 <p>Lesson 19: Using Equations to Solve Inequalities</p> <ul style="list-style-type: none"> • Solve inequalities and graph their solution sets on number lines. • Describe similarities and differences between inequalities and equations. 7.EE.B.4, 7.EE.B.4.b, MP7, 7.Mod3.AD9, 7.Mod3.AD10, 7.Mod3.AD11 <p>Lesson 20: Preserving and Reversing</p> <ul style="list-style-type: none"> • Solve one-step inequalities and graph their solution sets on number lines. • Identify when to reverse the inequality symbol in an inequality to produce an equivalent inequality. 7.EE.B.4.b, MP8, 7.Mod3.AD9, 7.Mod3.AD10, <p>Lesson 21: Solving Two-Step Inequalities</p> <ul style="list-style-type: none"> • Write and solve inequalities to represent context problems and 	<p>7.G.B.6, MP6, 7.Mod4.AD7</p> <p>Lesson 18: Surface Area of Right Prisms</p> <ul style="list-style-type: none"> • Calculate the surface area of right prisms by determining an efficient strategy for finding the sum of the areas of the lateral faces and bases. 7.G.B.6, MP7, 7.Mod4.AD7 <p>Lesson 19: Surface Area of Cylinders (Optional)</p> <ul style="list-style-type: none"> • Calculate the surface area of right circular cylinders. MP8 <p>Lesson 20: Surface Area of Right Pyramids</p> <ul style="list-style-type: none"> • Calculate the surface area of right pyramids. 7.G.B.6, MP6, 7.Mod4.AD7 <p>Lesson 21: Surface Area of Other Solids</p> <ul style="list-style-type: none"> • Calculate the surface area of solids composed of right prisms and right pyramids. 7.G.B.6, MP6, 7.Mod4.AD7 <hr/> <p>Topic E: Cross Sections and Volume</p> <p>Lesson 22: Understanding Planes and Cross Sections</p> <ul style="list-style-type: none"> • Sketch cross sections of right prisms and right pyramids cut by a plane parallel or perpendicular to the base. 7.G.A.3, MP7, 7.Mod4.AD3 <p>Lesson 23: Cross Section Scavenger Hunt</p>	<ul style="list-style-type: none"> • Model and solve a real-world problem involving percent. 7.RP.A.3, MP4, 7.Mod5.AD4 <p>Lesson 21: Making Money, Day 2</p> <ul style="list-style-type: none"> • Model and solve a real-world problem involving percent. 7.RP.A.3, MP1, 7.Mod5.AD4 <p>Lesson 22: Making Mixtures</p> <ul style="list-style-type: none"> • Develop and compare mixtures made from percents of two or more liquids. 7.RP.A.3, MP7, 7.Mod5.AD4 <p>Lesson 23: Percents of Percents</p> <ul style="list-style-type: none"> • Solve context problems involving percents related to a percent of the whole or unknown. 7.RP.A.3, 7.EE.A.2, MP2, 7.Mod5.AD4, 7.Mod5.AD6 <p>Lesson 24: Counting Problems</p> <ul style="list-style-type: none"> • Solve counting problems related to computing percent. 7.RP, MP6, 7.Mod5.AD1 	
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	<ul style="list-style-type: none"> Write expressions with division as equivalent expressions with multiplication by using multiplicative inverses. <p>7.NS.A.2.c, MP7, 7.Mod2.AD12</p> <hr/> <p>Topic E: Numerical Expressions with Rational Numbers</p> <p>Lesson 23: Properties of Operations with Rational Numbers</p> <ul style="list-style-type: none"> Evaluate expressions involving rational numbers by applying properties of operations. <p>7.NS.A, MP7, 7.Mod2.AD1</p> <p>Lesson 24: Order of Operations with Rational Numbers</p> <ul style="list-style-type: none"> Evaluate expressions containing exponents. Use the order of operations to evaluate numerical expressions containing rational numbers. <p>7.NS.A, 7.NS.A.2.c, MP6, 7.Mod2.AD1, 7.Mod2.AD12</p> <p>Lesson 25: Writing and Evaluating Expressions with Rational Numbers, Part 1</p> <ul style="list-style-type: none"> Write numerical expressions given mathematical and real-world contexts. Evaluate expressions and interpret their value in context. <p>7.NS.A.3, 7.EE.B.3, MP2, 7.Mod2.AD15</p> <p>Lesson 26: Writing and Evaluating Expressions with Rational Numbers, Part 2</p>	<p>identify restrictions to their solution sets.</p> <p>7.EE.B.4, 7.EE.B.4.b, MP2, 7.Mod3.AD6, 7.Mod3.AD9, 7.Mod3.AD11</p> <p>Lesson 22: Solving Problems Involving Inequalities</p> <ul style="list-style-type: none"> Write and solve inequalities comparing $px + q$ and r, where p, q, and r are specific rational numbers, and graph the solution sets. Write and solve inequalities to represent context problems and identify restrictions to their solution sets. <p>7.EE.B.4, 7.EE.B.4.b, MP6, 7.Mod3.AD6, 7.Mod3.AD9, 7.Mod3.AD11</p> <p>Lesson 23: Inequalities vs. Equations</p> <ul style="list-style-type: none"> Determine whether a situation should be modeled with an equation or with an inequality. Write a context that can be modeled by a given inequality. <p>7.EE.B.4, 7.EE.B.4.b, MP2, 7.Mod3.AD5, 7.Mod3.AD6, 7.Mod3.AD11</p> <p>■</p>	<ul style="list-style-type: none"> Explore cross sections formed when a right prism or a right pyramid is cut by a plane at an angle other than 90° to the base. <p>7.G.A.3 MP7, 7.Mod4.AD3</p> <p>Lesson 24: Volume of Prisms</p> <ul style="list-style-type: none"> Determine a formula for finding the volume of any right prism. Find the volume of a right prism. <p>7.G.B.6, MP7, 7.Mod4.AD7</p> <p>Lesson 25: Volume of Composite Solids</p> <ul style="list-style-type: none"> Find the volume of composite solids. <p>7.G.B.6, MP7, 7.Mod4.AD7</p> <p>Lesson 26: Designing a Fish Tank</p> <ul style="list-style-type: none"> Model real-world problems involving surface area and volume. <p>7.G.B.6, MP4, 7.Mod4.AD7</p> <p>■</p>		
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Module 1

Module 2

Module 3

Module 4

Module 5

Module

	<ul style="list-style-type: none">• Write and evaluate numerical expressions and interpret their value in context. <p>7.NS.A.3, 7.EE.B.3, MP4, 7.Mod2.AD15</p> <p>■</p>				
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Eureka Math² Year at a Glance

8: Ratios and Linearity

Module 1 Scientific Notation, Exponents, and Irrational Numbers	Module 2 Rigid Motions and Congruent Figures	Module 3 Dilations and Similar Figures	Module 4 Linear Equations in One and Two Variables	Module 5 Systems of Linear Equations	Module 6 Functions and Bivariate Statistics
<p>Topic A: Introduction to Scientific Notation</p> <p>Lesson 1: Large and Small Positive Numbers</p> <ul style="list-style-type: none"> Write very large and very small numbers in a form that uses exponents to prepare students for scientific notation. Approximate very large and very small quantities. <p>8.EE.A.3, MP2, 8.Mod1.AD8</p> <p>Lesson 2: Comparing Large Numbers</p> <ul style="list-style-type: none"> Write numbers as a single digit times a power of 10 in exponential form to approximate quantities. Compare large and small positive numbers by using <i>times as much as</i> language. <p>8.EE.A.3, 8.EE.A.4, MP7, 8.Mod1.AD9, 8.Mod1.AD11, 8.Mod1.AD12</p> <p>Lesson 3: Time to Be More Precise—Scientific Notation</p> <ul style="list-style-type: none"> Write numbers given in standard form in scientific notation. <p>8.EE.A.3, MP3, 8.Mod1.AD8</p>	<p>Topic A: Rigid Motions and Their Properties</p> <p>Lesson 1: Motions of the Plane</p> <ul style="list-style-type: none"> Informally describe how to map a figure to its image. Demonstrate that the distance between two points stays the same under rigid motions. <p>8.G.A.1, 8.G.A.1.a, 8.G.A.1.b, 8.G.A.1.c, MP5, 8.Mod2.AD1</p> <p>Lesson 2: Translations</p> <ul style="list-style-type: none"> Apply translations to the plane. Identify the basic properties of translations. <p>8.G.A.1, 8.G.A.1.a, 8.G.A.1.b, 8.G.A.1.c, MP6, 8.Mod2.AD1</p> <p>Lesson 3: Reflections</p> <ul style="list-style-type: none"> Apply reflections to the plane. Identify the basic properties of reflections. <p>8.G.A.1, 8.G.A.1.a, 8.G.A.1.b, 8.G.A.1.c, MP8, 8.Mod2.AD1</p> <p>Lesson 4: Translations and Reflections on the Coordinate Plane</p>	<p>Topic A: Dilations</p> <p>Lesson 1: Exploring Dilations</p> <ul style="list-style-type: none"> Informally describe the effects of dilations. Classify a dilation as a transformation that is not a rigid motion. <p>8.G.A.3, MP8, 8.Mod3.AD2</p> <p>Lesson 2: Enlargements</p> <ul style="list-style-type: none"> Apply a dilation with a whole-number scale factor greater than 1. Describe the effects of a dilation with a whole-number scale factor greater than 1. <p>8.G.A.3, MP6, 8.Mod3.AD2</p> <p>Lesson 3: Reductions and More Enlargements</p> <ul style="list-style-type: none"> Apply a dilation with a scale factor greater than 0. Describe the effects of a dilation with a scale factor greater than 0. <p>8.G.A.3, MP8, 8.Mod3.AD2</p> <hr/> <p>Topic B: Properties of Dilations</p>	<p>Topic A: Linear Equations in One Variable</p> <p>Lesson 1: Equations</p> <ul style="list-style-type: none"> Analyze an equation to make sense of how to solve it. Identify whether an equation is a linear equation. <p>8.EE.C.7.b, MP7, 8.Mod4.AD11</p> <p>Lesson 2: Solving Linear Equations</p> <ul style="list-style-type: none"> Identify the properties of equality. Solve multi-step linear equations in one variable with variables on both sides of the equations. <p>8.EE.C.7, 8.EE.C.7.b, MP6, 8.Mod4.AD9, 8.Mod4.AD11</p> <p>Lesson 3: Solving Linear Equations with Rational Coefficients</p> <ul style="list-style-type: none"> Solve multi-step linear equations in one variable with rational coefficients. <p>8.EE.C.7, 8.EE.C.7.b, MP7, 8.Mod4.AD9, 8.Mod4.AD11</p> <p>Lesson 4: Using Linear Equations to Solve Problems</p> <ul style="list-style-type: none"> Define variables and write equations that represent a given situation. 	<p>Topic A: Solving Systems of Linear Equations Graphically</p> <p>Lesson 1: Solving Problems with Equations and Their Graphs</p> <ul style="list-style-type: none"> Formulate a problem from a context. Apply different mathematical tools to model, analyze, and answer a real-world question. <p>8.EE.C.8.a, 8.EE.C.8.b, 8.EE.C.8.c, MP4, 8.Mod5.AD1, 8.Mod5.AD3, 8.Mod5.AD5</p> <p>Lesson 2: Introduction to Systems of Linear Equations</p> <ul style="list-style-type: none"> Graph a system of linear equations to identify the solution. Recognize that the ordered pair representing the intersection point of the lines is the solution to the system of linear equations. <p>8.EE.C.8.a, MP6, 8.Mod5.AD1</p> <p>Lesson 3: Identifying Solutions</p> <ul style="list-style-type: none"> Recognize that a system of linear equations that represents parallel lines has no solution. Analyze a system of linear equations to determine whether a solution exists. 	<p>Topic A: Functions</p> <p>Lesson 1: Motion and Speed</p> <ul style="list-style-type: none"> Calculate the average speed of linear and nonlinear motion. Understand that a function is a special type of rule. <p>8.F.A.1, MP8, 8.Mod6.AD1</p> <p>Lesson 2: Definition of a Function</p> <ul style="list-style-type: none"> Determine that a function is a rule that assigns to each input one and only one output. Identify functions that can be represented by an equation and those that cannot. <p>8.F.A.1, MP2, 8.Mod6.AD1</p> <p>Lesson 3: Linear Functions and Proportionality</p> <ul style="list-style-type: none"> Write equations that represent linear functions. Determine what inputs make sense in the context of a linear function. <p>8.F.A.3, MP2, 8.Mod6.AD3</p> <p>Lesson 4: More Examples of Functions</p> <ul style="list-style-type: none"> Determine that not all functions have numerical inputs and outputs.