



**DRAFT New Louisiana
Standards for 2016-2017
Correlation to *Eureka Math***

Grade 7
April 2016
Draft

**EUREKA
MATH™**

Grade 7 Mathematics

The majority of the Grade 7 Louisiana Standards for Mathematics are fully covered by the Grade 7 *Eureka Math* curriculum. The primary areas where the Grade 7 Louisiana Standards for Mathematics and *Eureka Math* do not align are in the domains of Expressions and Equations and Statistics and Probability. Standards from these domains will require use of *Eureka Math* content from other grade levels, along with supplemental material on braces used as grouping symbols. A detailed analysis of alignment is provided in the table below. With strategic placement of supplemental materials, *Eureka Math* can ensure students are successful in achieving the proficiencies of the Louisiana Standards for Mathematics while benefiting from the coherence and rigor of *Eureka Math*.

Indicators

-  Green indicates that the Louisiana standard is fully addressed in *Eureka Math*.
-  Yellow indicates that the Louisiana standard may not be completely addressed in *Eureka Math*.
-  Red indicates that the Louisiana standard is not addressed in *Eureka Math*.
-  Blue indicates there is a discrepancy between the grade level at which this standard is addressed in the Louisiana standards and in *Eureka Math*.

Standards for Mathematical Practice

Aligned Components of *Eureka Math*

1. Make sense of problems and persevere in solving them.

In grade 7, students solve problems involving ratios and rates and discuss how they solved them. Students solve real world problems through the application of algebraic and geometric concepts. Students seek the meaning of a problem and look for efficient ways to represent and solve it. They may check their thinking by asking themselves, “What is the most efficient way to solve the problem?”, “Does this make sense?”, and “Can I solve the problem in a different way?”

Lessons in every module engage students in making sense of problems and persevering in solving them as required by this standard. This standard is analogous to the CCSSM Standard for Mathematical Practice 1, which is specifically addressed in the following modules:

- G7 M1: Ratios and Proportional Relationships
- G7 M2: Rational Numbers
- G7 M4: Percent and Proportional Relationships
- G7 M6: Geometry

2. Reason abstractly and quantitatively.

In grade 7, students represent a wide variety of real world contexts through the use of real numbers and variables in mathematical expressions, equations, and inequalities. Students contextualize to understand the meaning of the number or variable as related to the problem and decontextualize to manipulate symbolic representations by applying properties of operations.

Lessons in every module engage students in reasoning abstractly and quantitatively as required by this standard. This standard is analogous to the CCSSM Standard for Mathematical Practice 2, which is specifically addressed in the following modules:

- G7 M1: Ratios and Proportional Relationships
- G7 M2: Rational Numbers
- G7 M3: Expressions and Equations
- G7 M4: Percent and Proportional Relationships
- G7 M5: Statistics and Probability

3. Construct viable arguments and critique the reasoning of others.

In grade 7, students construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models, and graphs, tables, and other data displays (i.e. box plots, dot plots, histograms, etc.). They further refine their mathematical communication skills through mathematical discussions in which they critically evaluate their own thinking and the thinking of other students. They pose questions like “How did you get that?”, “Why is that true?” “Does that always work?”. They explain their thinking to others and respond to others’ thinking.

Lessons in every module engage students in constructing viable arguments and critiquing the reasoning of others as required by this standard. This standard is analogous to the CCSSM Standard for Mathematical Practice 3, which is specifically addressed in the following modules:

- G7 M5: Statistics and Probability
- G7 M6: Geometry

Standards for Mathematical Practice

Aligned Components of *Eureka Math*

4. Model with mathematics.

In grade 7, students model problem situations symbolically, graphically, tabularly, and contextually. Students form expressions, equations, or inequalities from real world contexts and connect symbolic and graphical representations. Students explore covariance and represent two quantities simultaneously. They use measures of center and variability and data displays (i.e. box plots and histograms) to draw inferences, make comparisons and formulate predictions. Students use experiments or simulations to generate data sets and create probability models. Students need many opportunities to connect and explain the connections between the different representations. They should be able to use all of these representations as appropriate to a problem context.

Lessons in every module engage students in modeling with mathematics as required by this standard. This standard is analogous to the CCSSM Standard for Mathematical Practice 4, which is specifically addressed in the following modules:

- G7 M2: Rational Numbers
- G7 M3: Expressions and Equations
- G7 M5: Statistics and Probability

5. Use appropriate tools strategically.

Students consider available tools (including estimation and technology) when solving a mathematical problem and decide when certain tools might be helpful. For instance, students in grade 7 may decide to represent similar data sets using dot plots with the same scale to visually compare the center and variability of the data. Students might use physical objects or applets to generate probability data and use graphing calculators or spreadsheets to manage and represent data in different forms.

Lessons in every module engage students in using appropriate tools strategically as required by this standard. This standard is analogous to the CCSSM Standard for Mathematical Practice 5, which is specifically addressed in the following modules:

- G7 M4: Percent and Proportional Relationships
- G7 M5: Statistics and Probability
- G7 M6: Geometry

6. Attend to precision.

In grade 7, students continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning. Students define variables, specify units of measure, and label axes accurately. Students use appropriate terminology when referring to rates, ratios, probability models, geometric figures, data displays, and components of expressions, equations or inequalities.

Lessons in every module engage students in attending to precision as required by this standard. This standard is analogous to the CCSSM Standard for Mathematical Practice 6, which is specifically addressed in the following modules:

- G7 M2: Rational Numbers
- G7 M3: Expressions and Equations
- G7 M4: Percent and Proportional Relationships
- G7 M5: Statistics and Probability

Standards for Mathematical Practice

Aligned Components of *Eureka Math*

7. Look for and make use of structure.

Students routinely seek patterns or structures to model and solve problems. For instance, students recognize patterns that exist in ratio tables making connections between the constant of proportionality in a table with the slope of a graph. Students apply properties to generate equivalent expressions (i.e. $6 + 2x = 3(2 + x)$ by distributive property) and solve equations (i.e. $2c + 3 = 15$, $2c = 12$ by subtraction property of equality), $c = 6$ by division property of equality). Students compose and decompose two- and three-dimensional figures to solve real world problems involving scale drawings, surface area, and volume. Students examine tree diagrams or systematic lists to determine the sample space for compound events and verify that they have listed all possibilities.

Lessons in every module engage students in looking for and making use of structure as required by this standard. This standard is analogous to the CCSSM Standard for Mathematical Practice 7, which is specifically addressed in the following modules:

- G7 M2: Rational Numbers
- G7 M3: Expressions and Equations
- G7 M4: Percent and Proportional Relationships
- G7 M6: Geometry

8. Look for and express regularity in repeated reasoning.

In grade 7, students use repeated reasoning to understand algorithms and make generalizations about patterns. During multiple opportunities to solve and model problems, they may notice that $a/b \div c/d = ad/bc$ and construct other examples and models that confirm their generalization. They extend their thinking to include complex fractions and rational numbers. Students formally begin to make connections between covariance, rates, and representations showing the relationships between quantities. They create, explain, evaluate, and modify probability models to describe simple and compound events.

Lessons in every module engage students in looking for and expressing regularity in repeated reasoning as required by this standard. This standard is analogous to the CCSSM Standard for Mathematical Practice 8, which is specifically addressed in the following modules:

- G7 M3: Expressions and Equations

Domain

Standards

Aligned Components of *Eureka Math*

Domain	Standards	Aligned Components of <i>Eureka Math</i>
Ratios and Proportional Relationships	Cluster A: Analyze proportional relationships and use them to solve real-world and mathematical problems	
	7.RP.A.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{\frac{1}{2}}{\frac{1}{4}}$ miles per hour, equivalently 2 miles per hour.	G7 M1 Lessons 11–12: Ratios of Fractions and Their Unit Rates
	7.RP.A.2 Recognize and represent proportional relationships between quantities	
	a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.	G7 M1 Topic A: Proportional Relationships
	b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	G7 M1 Topic B: Unit Rate and the Constant of Proportionality
c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p , the relationship between the total cost and the number of items can be expressed as $t = pn$.	G7 M1 Lessons 8–9: Representing Proportional Relationships with Equations	

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	<p>d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0,0)$ and $(1, r)$ where r is the unit rate.</p>	<p>G7 M1 Lesson 10: Interpreting Graphs of Proportional Relationships</p>
	<p>7.RP.A.3 Use proportional relationships to solve multi-step ratio and percent problems of simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, and percent error.</p>	<p>G7 M1 Lesson 14: Multi-Step Ratio Problems G7 M4: Percent and Proportional Relationships</p>
<p>The Number System</p>	<p>Cluster A: Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.</p>	
	<p>7.NS.A.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.</p>	
	<p>a. Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.</p>	<p>G7 M2 Lesson 1: Opposite Quantities Combine to Make Zero</p>
	<p>b. Understand $p + q$ as the number located a distance q from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.</p>	<p>G7 M2 Lesson 2: Using the Number Line to Model the Addition of Integers G7 M2 Lesson 3: Understanding Addition of Integers</p>

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	<p>c. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.</p>	<p>G7 M2 Lesson 5: Understanding Subtraction of Integers and Other Rational Numbers</p> <p>G7 M2 Lesson 6: The Distance Between Two Rational Numbers</p>
	<p>d. Apply properties of operations as strategies to add and subtract rational numbers.</p>	<p>G7 M2 Lessons 8–9: Applying the Properties of Operations to Add and Subtract Rational Numbers</p>
	<p>7.NS.A.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p>	
	<p>a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</p>	<p>G7 M2 Lesson 10: Understanding Multiplication of Integers</p> <p>G7 M2 Lesson 11: Develop Rules for Multiplying Signed Numbers</p>
	<p>b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.</p>	<p>G7 M2 Lesson 12: Division of Integers</p>

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	<p>c. Apply properties of operations as strategies to multiply and divide rational numbers.</p>	<p>G7 M2 Lesson 15: Multiplication and Division of Rational Numbers</p> <p>G7 M2 Lesson 16: Applying the Properties of Operations to Multiply and Divide Rational Numbers</p>
	<p>d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.</p>	<p>G7 M2 Lesson 13: Converting Between Fractions and Decimals Using Equivalent Fractions</p> <p>G7 M2 Lesson 14: Converting Rational Numbers to Decimals Using Long Division</p>
	<p>7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p>G7 M2: Rational Numbers</p>
Expressions and Equations	<p>Cluster A: Use properties of operations to generate equivalent expressions.</p>	
	<p>7.EE.A.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients to include multiple grouping symbols (e.g., parentheses, brackets, and braces).</p>	<p>G7 M3 Topic A: Use Properties of Operations to Generate Equivalent Expressions</p> <p>Note: The only grouping symbols used in Grade 7 Module 3 are parentheses. Students use brackets in Algebra I Module 1 Lesson 13 when solving multi-step equations. However, supplemental material will be needed to provide students with the experience of using braces.</p>

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	<p>7.EE.A.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. <i>For example, $a + 0.05a = 1.05a$ means that “increase by 5%” is the same as “multiply by 1.05.”</i></p>	<p>G7 M2 Lessons 18–19: Writing, Evaluating, and Finding Equivalent Expressions with Rational Numbers</p> <p>G7 M3 Topic A: Use Properties of Operations to Generate Equivalent Expressions</p>
	<p>Cluster B: Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</p>	
	<p>7.EE.B.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. <i>For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.</i></p>	<p>G7 M2 Topic C: Applying Operations with Rational Numbers to Expressions and Equations</p> <p>G7 M3 Topic B: Solve Problems Using Expressions, Equations, and Inequalities</p> <p>G7 M4 Topic B: Percent Problems Including More Than One Whole</p>

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	<p>7.EE.B.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.</p>	
	<p>a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. <i>For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</i></p>	<p>G7 M2 Lesson 17: Comparing Tape Diagram Solutions to Algebraic Solutions</p> <p>G7 M2 Lessons 22–23: Solving Equations Using Algebra</p> <p>G7 M3 Lessons 8–9: Using If-Then Moves in Solving Equations</p> <p>G7 M3 Lessons 10–11: Angle Problems and Solving Equations</p>
	<p>b. Solve word problems leading to inequalities of the form $px + q > r$, $px + q \geq r$, $px + q < r$ or $px + q \leq r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. <i>For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.</i></p>	<p>G7 M3 Lesson 13: Inequalities</p> <p>G7 M3 Lesson 14: Solving Inequalities</p> <p>G7 M3 Lesson 15: Graphing Solutions to Inequalities</p>
<p>Geometry</p>	<p>Cluster A: Draw, construct, and describe geometrical figures and describe the relationships between them.</p>	
	<p>7.G.A.1 Solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.</p>	<p>G7 M1 Topic D: Ratios of Scale Drawings</p> <p>G7 M4 Topic C: Scale Drawings</p>

Domain	Standards	Aligned Components of <i>Eureka Math</i>
	<p>7.G.A.2 Draw (freehand, with ruler and protractor, or with technology) geometric shapes with given conditions. (Focus is on triangles from three measures of angles or sides, noticing when the conditions determine one and only one triangle, more than one triangle, or no triangle.)</p>	G7 M6 Topic B: Constructing Triangles
	<p>7.G.A.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.</p>	G7 M6 Topic C: Slicing Solids
	<p>Cluster B: Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</p>	
	<p>7.G.B.4 Know the formulas for the area and circumference of a circle and solve problems; give an informal derivation of the relationship between the circumference and area of a circle.</p>	<p>G7 M3 Lesson 16: The Most Famous Ratio of All</p> <p>G7 M3 Lesson 17: The Area of a Circle</p> <p>G7 M3 Lesson 18: More Problems on Area and Circumference</p> <p>G7 M3 Lesson 20: Composite Area Problems</p>
	<p>7.G.B.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and use them to solve simple equations for an unknown angle in a figure.</p>	<p>G7 M3 Lessons 10–11: Angle Problems and Solving Equations</p> <p>G7 M6 Topic A: Unknown Angles</p>

Domain	Standards	Aligned Components of <i>Eureka Math</i>
	<p>7.G.A.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. (Pyramids limited to surface area only.)</p>	<p>G7 M3 Topic C: Use Equations and Inequalities to Solve Geometry Problems</p> <p>G7 M6 Topic D: Problems Involving Area and Surface Area</p> <p>G7 M6 Topic E: Problems Involving Volume</p>
<p>Statistics and Probability</p>	<p>Cluster A: Use random sampling to draw inferences about a population.</p>	
	<p>7.SP.A.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.</p>	<p>G7 M5 Lesson 13: Populations, Samples, and Generalizing from a Sample to a Population</p> <p>G7 M5 Lesson 14: Selecting a Sample</p> <p>G7 M5 Lesson 15: Random Sampling</p> <p>G7 M5 Lesson 16: Methods for Selecting a Random Sample</p>
	<p>7.SP.A.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. <i>For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.</i></p>	<p>G7 M5 Lesson 17: Sampling Variability</p> <p>G7 M5 Lesson 18: Sampling Variability and the Effect of Sample Size</p> <p>G7 M5 Lesson 19: Understanding Variability When Estimating a Population Proportion</p> <p>G7 M5 Lesson 20: Estimating a Population Proportion</p>

Domain	Standards	Aligned Components of <i>Eureka Math</i>
	Cluster B: Draw informal comparative inferences about two populations.	
	<p>7.SP.B.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities using quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.</p>	<p>G6 M6 Topic B: Summarizing a Distribution That Is Approximately Symmetric Using the Mean and Mean Absolute Deviation</p> <p>G6 M6 Topic C: Summarizing a Distribution That Is Skewed Using the Median and the Interquartile Range</p> <p>G7 M5 Topic D: Comparing Populations</p>
	<p>7.SP.B.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. <i>For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.</i></p>	<p>G7 M5 Topic D: Comparing Populations</p>
	Cluster C: Investigate chance processes and develop, use, and evaluate probability models.	
	<p>7.SP.C.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.</p>	<p>G7 M5 Lesson 1: Chance Experiments</p>

Domain	Standards	Aligned Components of <i>Eureka Math</i>
	<p>7.SP.C.6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. <i>For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.</i></p>	<p>G7 M5 Topic A: Calculating and Interpreting Probabilities</p> <p>G7 M5 Lesson 8: The Difference Between Theoretical Probabilities and Estimated Probabilities</p> <p>G7 M5 Lesson 9: Comparing Estimated Probabilities to Probabilities Predicted by a Model</p>
	<p>7.SP.C.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.</p> <p>a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. <i>For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.</i></p> <p>b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?</p>	<p>G7 M5 Lesson 2: Estimating Probabilities by Collecting Data</p> <p>G7 M5 Lesson 8: The Difference Between Theoretical Probabilities and Estimated Probabilities</p> <p>G7 M5 Lesson 9: Comparing Estimated Probabilities to Probabilities Predicted by a Model</p>

Domain	Standards	Aligned Components of <i>Eureka Math</i>
	<p>7.SP.C.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.</p>	
	<p>a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.</p>	<p>G7 M5 Lesson 6: Using Tree Diagrams to Represent a Sample Space and to Calculate Probabilities G7 M5 Lesson 7: Calculating Probability of Compound Events</p>
	<p>b. Represent sample spaces for compound events using methods such as organized lists, tables, and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space that compose the event.</p>	<p>G7 M5 Lesson 6: Using Tree Diagrams to Represent a Sample Space and to Calculate Probabilities G7 M5 Lesson 7: Calculating Probabilities of Compound Events</p>
	<p>c. Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?</p>	<p>G7 M5 Lessons 10–11: Conducting a Simulation to Estimate the Probability of an Event</p>