

# Grade 6 | Tennessee Academic Standards for Mathematics Correlation to Eureka Math®

#### About Eureka Math

Created by Great Minds<sup>®</sup>, a mission-driven Public Benefit Corporation, *Eureka Math*<sup>®</sup> helps teachers deliver unparalleled math instruction that provides students with a deep understanding and fluency in math. Crafted by teachers and math scholars, the curriculum carefully sequences the mathematical progressions to maximize coherence from Prekindergarten through Precalculus–a principle tested and proven to be essential in students' mastery of math.

Teachers and students using *Eureka Math* find the trademark "Aha!" moments in *Eureka Math* to be a source of joy and inspiration, lesson after lesson, year after year.

#### Aligned

Great Minds offers detailed analyses that demonstrate how each grade of *Eureka Math* aligns with specific state standards. Access these free alignment studies at <u>greatminds.org/state-studies</u>.

#### Data

Schools and districts nationwide are experiencing student growth and impressive test scores after using *Eureka Math*. See their stories and data at greatminds.org/data.

#### **Full Suite of Resources**

Great Minds offers the *Eureka Math* curriculum as PDF downloads for free, noncommercial use. Access the free PDFs at <u>greatminds.org/</u><u>math/curriculum</u>.

The teacher-writers who created the curriculum have also developed essential resources, available only from Great Minds, including the following:

- Printed material in English and Spanish
- Digital resources
- Professional development
- Classroom tools and manipulatives
- Teacher support materials
- Parent resources

Standards for Mathematical Practice	Aligned Components of Eureka Math
<b>MP.1</b> Make sense of problems and persevere in solving them.	Lessons in every module engage students in mathematical practices These are designated in the Module Overview and labeled in lessons For example:
MP.2 Reason abstractly and quantitatively.	A STORY OF RATIOS Lesson 11 6•3
<b>MP.3</b> Construct viable arguments and critique the reasoning of others.	Lesson 11: Absolute Value—Magnitude and Distance
MP.4 Model with mathematics.	<ul> <li>Student Outcomes</li> <li>Students understand the absolute value of a number as its distance from zero on the number line.</li> <li>Students use absolute value to find the magnitude of a positive or negative quantity in a real-world situation.</li> </ul>
<b>MP.5</b> Use appropriate tools strategically.	Classwork Opening Exercise (4 minutes) For this warm-up exercise, students work individually to record two different rational numbers that are the same distance from zero. Students find as many examples as possible and reach a conclusion about what must be true for every pair of numbers that lie that same distance from zero.
MP.6 Attend to precision.	Opening Exercise         <
<b>MP.7</b> Look for and make use of structure.	<ul> <li>MP.8 After two minutes:</li> <li>What are some examples you found (pairs of numbers that are the same distance from zero)?</li> <li> <ul> <li>-1/2 and 1/2, 8.01 and -8.01, -7 and 7.</li> <li>What is the relationship between each pair of numbers?</li> </ul> </li> </ul>
<b>MP.8</b> Look for and express regularity in repeated reasoning.	<ul> <li>They are opposites.</li> <li>How does each pair of numbers relate to zero?</li> <li>Both numbers in each pair are the same distance from zero.</li> </ul>

## **Ratios and Proportional Relationships**

6.RP.A Understand ratio concepts and use ratio reasoning to solve problems.

#### Tennessee Academic Standards for Mathematics

<b>6.RP.A.1</b> Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. Make a distinction between ratios and fractions.	G6 M1 Topic A: Representing and Reasoning About Ratios G6 M1 Topic B: Collections of Equivalent Ratios G6 M1 Topic C: Unit Rates G6 M1 Lesson 24: Percent and Rates per 100 G6 M1 Lesson 25: A Fraction as a Percent
<b>6.RP.A.2</b> Understand the concept of a unit rate $\frac{a}{b}$ associated with a ratio $a:b$ with $b \neq 0$ . Use rate language in the context of a ratio relationship.	G6 M1 Topic C: Unit Rates
6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems (e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations).	<ul> <li>G6 M1 Lesson 3: Equivalent Ratios</li> <li>G6 M1 Lesson 4: Equivalent Ratios</li> <li>G6 M1 Lesson 5: Solving Problems by Finding Equivalent Ratios</li> <li>G6 M1 Lesson 6: Solving Problems by Finding Equivalent Ratios</li> <li>G6 M1 Lesson 7: Associated Ratios and the Value of a Ratio</li> <li>G6 M1 Lesson 8: Equivalent Ratios Defined Through the Value of a Ratio</li> <li>G6 M1 Topic B: Collections of Equivalent Ratios</li> <li>G6 M1 Lesson 16: From Ratios to Rates</li> <li>G6 M1 Lesson 17: From Rates to Ratios</li> <li>G6 M1 Lesson 18: Finding a Rate by Dividing Two Quantities</li> <li>G6 M1 Lesson 19: Comparison Shopping—Unit Price and Related Measurement Conversions</li> <li>G6 M1 Lesson 20: Comparison Shopping—Unit Price and Related Measurement Conversions</li> </ul>

for Mathematics	Aligned Components of Eureka Math
6.RP.A.3a	G6 M1 Lesson 3: Equivalent Ratios
Make tables of equivalent ratios	G6 M1 Lesson 4: Equivalent Ratios
relating quantities with whole number measurements, find missing values	G6 M1 Lesson 5: Solving Problems by Finding Equivalent Ratios
in the tables, and plot the pairs of values	G6 M1 Lesson 6: Solving Problems by Finding Equivalent Ratios
on the coordinate plane. Use tables to compare ratios.	G6 M1 Topic B: Collections of Equivalent Ratios
6.RP.A.3b	G6 M1 Lesson 21: Getting the Job Done–Speed, Work, and Measurement Units
Solve unit rate problems including	G6 M1 Lesson 22: Getting the Job Done–Speed, Work, and Measurement Units
those involving unit pricing and constant speed.	G6 M1 Lesson 23: Problem-Solving Using Rates, Unit Rates, and Conversions
6.RP.A.3c	G6 M1 Topic D: Percent
Find a percent of a quantity as a rate per 100 (e.g., $30\%$ of a quantity means $\frac{30}{100}$ times the quantity); solve problems involving finding the whole, given a part and the percent.	
6.RP.A.3d	G6 M1 Lesson 21: Getting the Job Done–Speed, Work, and Measurement Units
Use ratio reasoning to convert customary	G6 M1 Lesson 22: Getting the Job Done–Speed, Work, and Measurement Units
and metric measurement units (within the same system); manipulate and transform units appropriately when multiplying or dividing quantities.	G6 M1 Lesson 23: Problem-Solving Using Rates, Unit Rates, and Conversions

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### The Number System

6.NS.A Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

Tennessee Academic Standards for Mathematics	Aligned Components of Eureka Math
6.NS.A.1	G6 M2 Topic A: Arithmetic Operations Including Dividing by a Fraction
Interpret and compute quotients of fractions, and solve real-world and mathematical problems involving division of fractions by fractions (e.g., connecting visual fraction models and equations to represent the problem is suggested).	

### The Number System

6.NS.B Compute fluently with multi-digit numbers and find common factors and multiples.

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<b>6.NS.B.2</b> Fluently divide multi-digit numbers using a standard algorithm.	G6 M2 Topic C: Dividing Whole Numbers and Decimals
<b>6.NS.B.3</b> Fluently add, subtract, multiply, and divide multi-digit decimals using a standard algorithm and making connections to previous conceptual work with each operation.	G6 M2 Topic B: Multi-Digit Decimal Operations—Adding, Subtracting, and Multiplying G6 M2 Lesson 14: The Division Algorithm—Converting Decimal Division into Whole Number Division Using Fractions G6 M2 Lesson 15: The Division Algorithm—Converting Decimal Division to Whole Number Division Using Mental Math

for Mathematics	Aligned Components of Eureka Math
6.NS.B.4	G6 M2 Lesson 17: Divisibility Tests for 3 and 9
Find the greatest common factor of two	G6 M2 Lesson 18: Least Common Multiple and Greatest Common Factor
whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor.	G6 M2 Lesson 19: The Euclidean Algorithm as an Application of the Long Division Algorithm

# Tennessee Academic Standards

#### **The Number System**

6.NS.C Apply and extend previous understandings of numbers to the system of rational numbers.

#### **Tennessee Academic Standards** for Mathematics

6.NS.C.5	G6 M3 Lesson 2: Real-World Positive and Negative Numbers and Zero
Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation as well as describing situations in which opposite quantities can combine to make 0.	G6 M3 Lesson 3: Real-World Positive and Negative Numbers and Zero G6 M3 Lesson 4: The Opposite of a Number G6 M3 Lesson 5: The Opposite of a Number's Opposite G6 M3 Lesson 6: Rational Numbers on the Number Line G6 M3 Lesson 13: Statements of Order in the Real World G7 M2 Lesson 1: Opposite Quantities Combine to Make Zero

6.NS.C.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.	This standard is fully addressed by the lessons aligned to its subsections.
<b>6.NS.C.6a</b> Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself.	G6 M3 Topic A: Understanding Positive and Negative Numbers on the Number Line
<b>6.NS.C.6b</b> Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.	G6 M3 Topic C: Rational Numbers and the Coordinate Plane
<b>6.NS.C.6c</b> Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.	G6 M3 Lesson 7: Ordering Integers and Other Rational Numbers G6 M3 Lesson 9: Comparing Integers and Other Rational Numbers G6 M3 Lesson 10: Writing and Interpreting Inequality Statements Involving Rational Numbers G6 M3 Lesson 11: Absolute Value–Magnitude and Distance

for Mathematics	Aligned Components of Eureka Math
6.NS.C.7	G6 M3 Lesson 8: Ordering Integers and Other Rational Numbers
Understand ordering and absolute value	G6 M3 Lesson 11: Absolute Value–Magnitude and Distance
of rational numbers.	G6 M3 Lesson 12: The Relationship Between Absolute Value and Order
	G6 M3 Lesson 13: Statements of Order in the Real World
6.NS.C.7a	G6 M3 Lesson 7: Ordering Integers and Other Rational Numbers
Interpret statements of inequality	G6 M3 Lesson 9: Comparing Integers and Other Rational Numbers
as statements about the relative position of two numbers on a number line diagram.	G6 M3 Lesson 10: Writing and Interpreting Inequality Statements Involving Rational Numbers
6.NS.C.7b	G6 M3 Lesson 7: Ordering Integers and Other Rational Numbers
Write, interpret, and explain statements	G6 M3 Lesson 9: Comparing Integers and Other Rational Numbers
of order for rational numbers in real-world contexts.	G6 M3 Lesson 10: Writing and Interpreting Inequality Statements Involving Rational Numbers
6.NS.C.7c	G6 M3 Lesson 18: Distance on the Coordinate Plane
Understand the absolute value of a rational number as its distance from 0 on the number line and distinguish comparisons of absolute value from statements about order in a real-world context.	G6 M3 Lesson 19: Problem Solving and the Coordinate Plane

# **Tennessee Academic Standards**

Aligned Components of Eureka Math

6.NS.C.8	G6 M3 Topic C: Rational Numbers and the Coordinate Plane
Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	

### **Expressions and Equations**

6.EE.A Apply and extend previous understandings of arithmetic to algebraic expressions.

#### Tennessee Academic Standards for Mathematics

<b>6.EE.A.1</b> Write and evaluate numerical expressions involving whole-number exponents.	G6 M4 Topic B: Special Notations of Operations G6 M4 Lesson 16: Write Expressions in Which Letters Stand for Numbers
<b>6.EE.A.2</b> Write, read, and evaluate expressions in which variables stand for numbers.	G6 M4 Topic C: Replacing Letters and Numbers G6 M4 Topic D: Expanding, Factoring, and Distributing Expressions G6 M4 Topic E: Expressing Operations in Algebraic Form G6 M4 Topic F: Writing and Evaluating Expressions and Formulas
<b>6.EE.A.2a</b> Write expressions that record operations with numbers and with variables.	G6 M4 Topic D: Expanding, Factoring, and Distributing Expressions G6 M4 Topic E: Expressing Operations in Algebraic Form

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<b>6.EE.A.2b</b> Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity.	G6 M4 Topic D: Expanding, Factoring, and Distributing Expressions G6 M4 Topic E: Expressing Operations in Algebraic Form
<b>6.EE.A.2c</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).	G6 M4 Lesson 6: The Order of Operations
<b>6.EE.A.3</b> Apply the properties of operations (including, but not limited to, commutative, associative, and distributive properties) to generate equivalent expressions.	G6 M4 Topic A: Relationships of the Operations G6 M4 Lesson 9: Writing Addition and Subtraction Expressions G6 M4 Lesson 11: Factoring Expressions G6 M4 Lesson 12: Distributing Expressions

#### Aligned Components of Eureka Math

6.EE.A.4	G6 M4 Lesson 8: Replacing Numbers with Letters
Identify when expressions are equivalent	G6 M4 Lesson 9: Writing Addition and Subtraction Expressions
(i.e., when the expressions name the same number regardless of which value	G6 M4 Lesson 10: Writing and Expanding Multiplication Expressions
is substituted into them).	G6 M4 Lesson 11: Factoring Expressions
	G6 M4 Lesson 12: Distributing Expressions
	G6 M4 Lesson 13: Writing Division Expressions

#### **Expressions and Equations**

6.EE.B Reason about and solve one-variable equations and inequalities.

#### Tennessee Academic Standards for Mathematics

<b>6.EE.B.5</b> Understand that a solution to an equation or inequality is the value(s) that makes that statement true. Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	G6 M4 Topic G: Solving Equations G6 M4 Topic H: Applications of Equations
<b>6.EE.B.6</b> Use variables to represent numbers and write expressions when solving real-world and mathematical problems; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	G6 M4 Topic F: Writing and Evaluating Expressions and Formulas G6 M4 Topic G: Solving Equations G6 M4 Topic H: Applications of Equations

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6.EE.B.7	G6 M4 Lesson 26: One-Step Equations–Addition and Subtraction
Solve real-world and mathematical problems by writing and solving one-step equations of the form $x + p = q$ , $px = q$ , $x - p = q$ , and $\frac{x}{p} = q$ for cases in which p, $q$ , and $x$ are all nonnegative rational numbers and $p \neq 0$ .	<ul> <li>G6 M4 Lesson 27: One-Step Equations—Multiplication and Division</li> <li>G6 M4 Lesson 28: Two-Step Problems—All Operations</li> <li>G6 M4 Lesson 29: Multi-Step Problems—All Operations</li> <li>G6 M4 Lesson 30: One-Step Problems in the Real World</li> <li>G6 M4 Lesson 31: Problems in Mathematical Terms</li> <li>G6 M4 Lesson 32: Multi-Step Problems in the Real World</li> </ul>
<b>6.EE.B.8</b> Interpret and write an inequality of the form $x > c, x < c, x \le c$ , or $x \ge c$ which represents a condition or constraint in a real-world or mathematical problem. Recognize that inequalities have infinitely many solutions; represent solutions of inequalities on number line diagrams.	G6 M4 Lesson 33: From Equations to Inequalities G6 M4 Lesson 34: Writing and Graphing Inequalities in Real-World Problems

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# **Expressions and Equations**

6.EE.C Represent and analyze quantitative relationships between dependent and independent variables.

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6.EE.C.9	This standard is fully addressed by the lessons aligned to its subsections.
Use variables to represent two quantities in a real-world problem that change in relationship to one another.	
6.EE.C.9a	G6 M4 Lesson 31: Problems in Mathematical Terms
Write an equation in the form of $y = px$ where $y$ , $p$ , and $x$ are all non-negative and $p \neq 0$ , to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable.	G6 M4 Lesson 32: Multi-Step Problems in the Real World
6.EE.C.9b	G6 M4 Lesson 31: Problems in Mathematical Terms
Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.	G6 M4 Lesson 32: Multi-Step Problems in the Real World

#### Geometry

6.G.A Solve real-world and mathematical problems involving area, surface area, and volume.

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<b>6.G.A.1</b> Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; know and apply these techniques in the context of solving real-world and mathematical problems.	G6 M5 Topic A: Area of Triangles, Quadrilaterals, and Polygons G6 M5 Lesson 8: Drawing Polygons in the Coordinate Plane G6 M5 Lesson 9: Determining Perimeter and Area of Polygons on the Coordinate Plane
<b>6.G.A.2</b> Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = Bh$ where <i>B</i> is the area of the base to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	G6 M5 Topic C: Volume of Right Rectangular Prisms G6 M5 Lesson 19: Surface Area and Volume in the Real World G6 M5 Lesson 20: Addendum Lesson for Modeling–Applying Surface Area and Volume to Aquariums

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6.G.A.3	G6 M5 Topic B: Polygons on the Coordinate Plane
Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side that joins two vertices (vertical or horizontal segments only). Apply these techniques in the context of solving real-world and mathematical problems.	
6.G.A.4	G6 M5 Topic D: Nets and Surface Area
Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.	

#### **Statistics and Probability**

6.SP.A Develop understanding of statistical variability.

#### Tennessee Academic Standards for Mathematics

6.SP.A.1	G6 M6 Lesson 1: Posing Statistical Questions
Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.	

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G6 M6 Lesson 2: Displaying a Data Distribution
G6 M6 Lesson 3: Creating a Dot Plot
G6 M6 Lesson 4: Creating a Histogram
G6 M6 Lesson 5: Describing a Distribution Displayed in a Histogram
G6 M6 Topic B: Summarizing a Distribution that Is Approximately Symmetric Using the Mean and Mean Absolute Deviation
G6 M6 Topic C: Summarizing a Distribution that is Skewed Using the Median and the Interquartile Range
G6 M6 Topic D: Summarizing and Describing Distributions
G6 M6 Lesson 7: The Mean as a Balance Point
G6 M6 Lesson 8: Variability in a Data Distribution
G6 M6 Lesson 9: The Mean Absolute Deviation (MAD)
G6 M6 Lesson 10: Describing Distributions Using the Mean and MAD
G6 M6 Lesson 11: Describing Distributions Using the Mean and MAD
G6 M6 Topic C: Summarizing a Distribution that is Skewed Using the Median and the Interquartile Range
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## **Statistics and Probability**

6.SP.B Summarize and describe distributions.

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6.SP.B.4	G6 M6 Lesson 2: Displaying a Data Distribution
Display a single set of numerical data using dot plots (line plots), box plots, pie charts and stem plots.	G6 M6 Lesson 3: Creating a Dot Plot
	G6 M6 Lesson 4: Creating a Histogram
	G6 M6 Lesson 5: Describing a Distribution Displayed in a Histogram
	G6 M6 Lesson 6: Describing the Center of a Distribution Using the Mean
	G6 M6 Lesson 7: The Mean as a Balance Point
	G6 M6 Lesson 8: Variability in a Data Distribution
	G6 M6 Lesson 10: Describing Distributions Using the Mean and MAD
	G6 M6 Lesson 11: Describing Distributions Using the Mean and MAD
	G6 M6 Lesson 14: Summarizing a Distribution Using a Box Plot
	G6 M6 Lesson 15: More Practice with Box Plots
	G6 M6 Lesson 16: Understanding Box Plots
	G6 M6 Lesson 17: Developing a Statistical Project
	G6 M6 Lesson 18: Connecting Graphical Representations and Numerical Summaries
	G6 M6 Lesson 20: Describing Center, Variability, and Shape of a Data Distribution from a Graphic Representation
	G6 M6 Lesson 21: Summarizing a Data Distribution by Describing Center, Variability, and Shape
	G6 M6 Lesson 22: Presenting a Summary of a Statistical Project
6.SP.B.5	This standard is fully addressed by the lessons aligned to its subsections.
Summarize numerical data sets in relation to their context.	

for Mathematics	Aligned Components of Eureka Math
6.SP.B.5a	6 M6 Topic A: Understanding Distributions
Report the number of observations.	6 M6 Topic B: Summarizing a Distribution That Is Approximately Symmetric Using the Mean and Mean Absolute Deviation
	6 M6 Topic C: Summarizing a Distribution That Is Skewed Using the Median and the Interquartile Range
	6 M6 Topic D: Summarizing and Describing Distributions
6.SP.B.5b	6 M6 Topic A: Understanding Distributions
Describe the nature of the attribute under investigation, including how it was measured and its units of measurement.	6 M6 Topic B: Summarizing a Distribution That Is Approximately Symmetric Using the Mean and Mean Absolute Deviation
	6 M6 Topic C: Summarizing a Distribution That Is Skewed Using the Median and the Interquartile Range
	6 M6 Topic D: Summarizing and Describing Distributions
6.SP.B.5c	G6 M6 Lesson 21: Summarizing a Data Distribution by Describing Center, Variability, and Shape
Give quantitative measures of center (median and/or mean) and variability (range) as well as describing any overall pattern with reference to the context in which the data were gathered.	G6 M6 Lesson 22: Presenting a Summary of a Statistical Project
6.SP.B.5d	G6 M6 Lesson 21: Summarizing a Data Distribution by Describing Center, Variability, and Shape
Relate the choice of measures of center to the shape of the data distribution and the context in which the data were gathered.	G6 M6 Lesson 22: Presenting a Summary of a Statistical Project