IXL Skill Plan

Alabama Course of Study (Common Core): Grade 6

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6.RP | Ratios and Proportional Relationships

Understand ratio concepts and use ratio reasoning to solve problems.

6.RP.1: Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

1. Write a ratio 83K
2. Write a ratio: word problems SBQ
3. Which model represents the ratio? 66V

6.RP.2: Understand the concept of a unit rate a/b associated with a ratio a:b with b is not equal to 0, and use rate language in the context of a ratio relationship.

1. Unit rates JSZ

6.RP.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.

6.RP.3.a: Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

Equivalent ratios
1. Identify equivalent ratios 2LM
2. Write an equivalent ratio NEA
3. Equivalent ratios: word problems RLZ

Ratio tables
4. Ratio tables PPF

Plot on the coordinate plane
5. Ratios and rates: complete a table and make a graph 6Z2

6.RP.3.b: Solve unit rate problems including those involving unit pricing and constant speed.

Unit rates
1. Compare rates: word problems NAF
2. Ratios and rates: word problems ZB9

Unit pricing
3. Unit prices UKD

6.RP.3.c: Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times

Represent percentages
1. What percentage is illustrated? RHG

the quantity); solve problems involving finding the whole, given a part and the percent.

2. Understanding percents: strip models 5JV

Convert between fractions, percents, and decimals

Percents of numbers

3. Convert fractions to percents using grid models ZDZ

4. Convert between percents, fractions, and decimals ZAV

5. Convert between percents, fractions, and decimals: word problems 7CZ

Solve percent problems with models

Find the whole

6. Solve percent problems using grid models YX6

7. Solve percent problems using strip models MEA

Find a percent of a number

Real-world problems

8. Percents of numbers and money amounts 8N4

9. Percents of numbers: word problems BBY

10. Percents of numbers: fractional and decimal percents CD5

Find what percent one number is of another

11. Find what percent one number is of another PE7

12. Find what percent one number is of another: word problems 49B

Find the whole

13. Find the total given a part and a percent D6L

Solve percent problems

14. Solve percent problems ELY

15. Solve percent word problems YWB

6.RP.3.d: Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

1. Convert and compare customary units 9TJ

2. Convert, compare, add, and subtract mixed customary units 97L

3. Customary unit conversions involving fractions and mixed numbers UHE

4. **Convert and compare metric units** FDH

5. **Convert between customary and metric systems** 5CF

6.NS | The Number System

> **Apply and extend previous understandings of multiplication and division to divide fractions by fractions.**

6.NS.4: Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.

Divide fractions
1. Reciprocals 5BT
2. Divide fractions DS2
3. Divide fractions and mixed numbers N2B

Word problems
4. Divide fractions by whole numbers in recipes ENK
5. Divide fractions and mixed numbers: word problems WAH

> **Compute fluently with multi-digit numbers and find common factors and multiples.**

6.NS.5: Fluently divide multi-digit numbers using the standard algorithm.

1. Division patterns with zeroes CEZ
2. Divide numbers ending in zeroes: word problems 95H
3. Divide whole numbers - 2-digit divisors FL2
4. Divide whole numbers - 3-digit divisors STW

6.NS.6: Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Add and subtract
1. Add and subtract decimal numbers 79J
2. Add and subtract decimals: word problems 97T
3. Complete the decimal addition or subtraction sentence QRH
4. Maps with decimal distances J7D

Multiply and divide
5. Multiply decimals 2WT
6. Divide decimals by whole numbers NLL
7. Divide decimals by whole numbers: word problems TWZ
8. Multiply and divide decimals by powers of ten KNH
9. Division with decimal quotients BFR

Mixed operations

10. Add, subtract, multiply, or divide two decimals   P6W

11. Add, subtract, multiply, or divide two decimals: word problems   8HT

6.NS.7: Find the greatest common factor of two 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.

1. Identify factors   BGJ
2. Find all the factor pairs of a number   VTM
3. Greatest common factor   AMB
4. Least common multiple   NGA
5. GCF and LCM: word problems   ZB8

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

6.NS.8: 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.

1. Understanding integers   8EP

6.NS.9: 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.

6.NS.9.a: 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, e.g., -(-3) = 3, and that 0 is its own opposite.

1. Understanding opposite integers   X8L
2. Opposites of rational numbers   E8R
3. Rational numbers: find the sign   V2E

6.NS.9.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

1. Quadrants   F5T
2. Reflect a point over an axis   32S

both axes.

6.NS.9.c: 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.

Number lines
1. Decimal number lines AXN
2. Integers on number lines K6J
3. Graph integers on horizontal and vertical number lines 36C
4. Rational numbers on number lines DJE

Coordinate plane
5. Objects on a coordinate plane GFN
6. Graph points on a coordinate plane VHQ

6.NS.10: Understand ordering and absolute value of rational numbers.

6.NS.10.a: Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.

1. Compare integers 4G6

6.NS.10.b: Write, interpret, and explain statements of order for rational numbers in real-world contexts.

1. Compare and order rational numbers using number lines FMS
2. Compare rational numbers KS2
3. Put rational numbers in order 5AX
4. Compare and order rational numbers: word problems ETK
5. Compare temperatures above and below zero UVD

6.NS.10.c: Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.

1. Understanding absolute value TLR
2. Absolute value 2YZ
3. Absolute value and integers: word problems 9CW
4. Absolute value of rational numbers KGX

6.NS.10.d: Distinguish comparisons of absolute value from statements about order.

1. Integer inequalities with absolute values 4A8
2. Put rational numbers in order 5AX
3. Absolute value of rational numbers KGX

6.NS.11: 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.

1. Coordinate planes as maps N96
2. Distance between two points A7P
3. Follow directions on a coordinate plane XDQ

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6.EE | Expressions and Equations

Apply and extend previous understandings of arithmetic to algebraic expressions.

6.EE.12: Write and evaluate numerical expressions involving whole-number exponents.

Write expressions
1. Write multiplication expressions using exponents TY5
2. Write powers of ten with exponents DLL

Evaluate expressions
3. Evaluate exponents XDA
4. Find the missing exponent or base HC5
5. Exponents with decimal bases D5D
6. Exponents with fractional bases GEQ

6.EE.13: Write, read, and evaluate expressions in which letters stand for numbers.

6.EE.13.a: Write expressions that record operations with numbers and with letters standing for numbers.

1. Write variable expressions: one operation F5B
2. Write variable expressions: two operations CX9

6.EE.13.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.

1. Identify terms and coefficients 9KE
2. Sort factors of variable expressions QXS

6.EE.13.c: 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).

Order of operations
1. Evaluate numerical expressions one step at a time XCQ
2. Evaluate numerical expressions involving whole numbers MLU
3. Identify mistakes involving the order of operations V46
4. Evaluate numerical expressions involving decimals YEE
5. Evaluate numerical expressions involving fractions WNE

Evaluate variable expressions

6. Evaluate variable expressions with whole numbers Q8Z

7. Evaluate multi-variable expressions HC9

8. Evaluate variable expressions with decimals, fractions, and mixed numbers 49T

9. Evaluate variable expressions: word problems 7XA

Real-world formulas

10. Convert between Celsius and Fahrenheit UJK

6.EE.14: Apply the properties of operations to generate equivalent expressions.

1. Multiply using the distributive property: area models 7XM

2. Multiply using the distributive property 2HH

3. Factor using the distributive property PGZ

4. Write equivalent expressions using properties R8H

6.EE.15: Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).

1. Identify equivalent expressions using strip models W5U

2. Identify equivalent expressions I KFG

3. Identify equivalent expressions II HTG

Reason about and solve one-variable equations and inequalities.

6.EE.16: Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

1. Does x satisfy an equation? VMB

2. Which x satisfies an equation? VG8

3. Solutions to inequalities P9N

6.EE.17: Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

1. Write variable expressions: word problems 6LQ

6.EE.18: Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and

Solve equations

1. Model and solve equations using algebra tiles G6Z

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x are all nonnegative rational numbers.

2. Write and solve equations that represent diagrams FSQ

3. Solve one-step addition and subtraction equations with whole numbers JXM

4. Solve one-step multiplication and division equations with whole numbers JUA

5. Solve one-step equations with whole numbers WLR

6. Solve one-step addition and subtraction equations with decimals and fractions 5D2

7. Solve one-step multiplication and division equations with decimals and fractions T53

Real-world problems

8. Solve one-step addition and subtraction equations: word problems 35Q

9. Solve one-step multiplication and division equations: word problems GMV

10. Write a one-step equation: word problems YVX

11. Solve one-step equations: word problems BXY

6.EE.19: Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x > c or x < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

Graph inequalities

1. Graph inequalities on number lines CXX

Write inequalities

2. Write inequalities from number lines N99

Word problems

3. Write and graph inequalities: word problems AGB

Represent and analyze quantitative relationships between dependent and independent variables.

6.EE.20: Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.

Independent and dependent variables

1. Identify independent and dependent variables in tables and graphs YFW

2. Identify independent and dependent variables: word problems 9UJ

Find values

3. Find a value using two-variable equations 46Q

4. Find a value using two-variable equations: word problems XRJ

5. Complete a table for a two-variable relationship TZB

Make and interpret graphs

6. Identify the graph of an equation WN7

7. Complete a table and graph a two-variable equation EY5

8. Graph a two-variable equation TJA

9. Interpret a graph: word problems KZD

Write equations

10. Write an equation from a graph using a table BCM

11. Solve word problems by finding two-variable equations UJQ

12. Write a two-variable equation from a table ZTL

13. Write a two-variable equation 2RE

6.G | **Geometry**

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

6.G.21: Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

Triangles
1. Understanding area of a triangle PLL
2. Area of triangles C8S

Quadrilaterals
3. Understanding area of a parallelogram QMU
4. Area of parallelograms Y8K
5. Understanding area of a trapezoid 42R
6. Area of trapezoids PKW
7. Area of rhombuses 2QG
8. Area of quadrilaterals 27F

Compound figures
9. Area of compound figures 76U
10. Area of compound figures with triangles 5V2

6.G.22: 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 = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

1. Volume of cubes and rectangular prisms XHF
2. Volume of cubes and rectangular prisms with fractional side lengths BQK
3. Volume of cubes and rectangular prisms: word problems BBM

6.G.23: Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

1. Area and perimeter of squares and rectangles on the coordinate plane UCD
2. Graph triangles and quadrilaterals E55

6.G.24: 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.

1. Nets of three-dimensional figures 8KP
2. Surface area of cubes and rectangular prisms RMG
3. Surface area of triangular prisms UGR
4. Surface area of pyramids 5XW

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6.SP | Statistics and Probability

Develop understanding of statistical variability.

6.SP.25: Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.

1. Identify statistical questions   PT7

6.SP.26: Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.

Line plots
1. Create line plots   5HD
2. Describe distributions in line plots   RZL

Stem-and-leaf plots
3. Interpret stem-and-leaf plots   2E8
4. Create stem-and-leaf plots   7VE

Box-and-whisker plots
5. Box plots   E9F
6. Calculate quartiles and interquartile range   MNV

6.SP.27: Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.

1. Mean, median, mode, and range: find the missing number   77K

Summarize and describe distributions.

6.SP.28: Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

1. Create line plots   5HD
2. Create histograms   7NG
3. Box plots   E9F

6.SP.29: Summarize numerical data sets in relation to their context, such as by:

6.SP.29.a: Reporting the number of observations.

1. Interpret line plots   M5Y
2. Interpret histograms   CBF

6.SP.29.b: Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

1. Identify representative, random, and biased samples   ZQZ

6.SP.29.c: Giving 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.

Measures of center and variability

1. Calculate mean, median, mode, and range ZZK
2. Interpret charts and graphs to find mean, median, mode, and range 2WK
3. Calculate mean absolute deviation JUV
4. Calculate quartiles and interquartile range MNV
5. Describe distributions in line plots RZL

Outliers

6. Identify an outlier and describe the effect of removing it 8Q5

6.SP.29.d: Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.