Grade 6

Week 1: Ratios & Proportional Relationships (4 Days)

➢ Day 1

Objective

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

  o Example: "The ratio of wings to beaks in the birdhouse at the zoo was 2:1, because for every 2 wings there was 1 beak."

Understand the concept of a unit rate a/b associated with a ratio a: b with b ≠ 0 (b not equal to zero), and use rate language in the context of a ratio relationship.

  o Example: "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."

- Introductions
  - Meet and Greet
  - Who we are
  - What we do
  - Importance of program to scholars
  - Rules and Regulations
- Ice Breaker
- Pre Assessment Exam

❖ Lecture

  o Scholars will recognize a ratio in various forms. Describe a relationship using ratios. Express unit rate as a ratio of part-to-one.

Activity

➢ Day 2
Objective

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.

Solve unit rate problems including those involving unit pricing and constant speed.
- o Example: If it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?

- ❖ Lecture

- o Scholars will use tables to compare ratios. Use concepts of unit rate to solve problems. Recognize when to use unit rate and ratios to solve problems.

- ➢ Day 3
  Objective
  Find a percent of a quantity as a rate per 100 (e.g. 30% of a quantity means 30/100 times the quantity). given a percent, solve problems involving finding the whole given a part and the part given the whole.

  Given a conversion factor, use ratio reasoning to convert measurement units within one system of measurement and between two systems of measurements (customary and metric); manipulate and transform units appropriately when multiplying or dividing quantities. For example, given 1 in. = 2.54 cm, how many centimeters are in 6 inches?

  - ❖ Lecture

  - o Given a percent, solve problems involving finding the whole given a part and the part given the whole.

- ➢ Day 4
  Objective
  Review the topics covered throughout the week and take weekly quiz.

  - ❖ Lecture

  - o Review topics covered throughout the week and answer any questions. Thoroughly demonstrate how to solve challenging problems.
  - o Ratios & Proportional Relationships

Week 2: The Number System (4 Days)

➤ Day 1
  Objective
  Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, including reasoning strategies such as using visual fraction models and equations to represent the problem.
  - ○ Examples:
    - ○ Create a story context for $(2/3)\div(3/4)$ and use a visual fraction model to show the quotient;
    - ○ Use the relationship between multiplication and division to explain that $(2/3)\div(3/4)=8/9$ because 3/4 of 8/9 is 2/3. (In general, $(a/b)\div(c/d)=ad/bc$.)
    - ○ How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally?
    - ○ How many 3/4-cup servings are in 2/3 of a cup of yogurt?
    - ○ How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?

  - ❖ Lecture
    - ○ Apply and extend understandings of multiplication and division to divide fractions by fractions.

➤ Day 2
  Objective

  Find the common multiples of two whole numbers less than or equal to 12 and the common factors of two whole numbers less than or equal to 100.

  Find the greatest common factor of 2 whole numbers and 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 factors. (GCF)

  - ○ Example:
    - ○ $36 + 8 = 4(9 + 2)$ b. Apply the least common multiple of two whole numbers less than or equal to 12 to solve real-world problems.

  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, debits/credits, positive/negative electric charge); use positive and

negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

❖ Lecture

  o Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
  o Apply and extend previous understandings of numbers to the system of rational numbers.

➢ Day 3
  Objective
  Understand a rational number as a point on the number line.
  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.

  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.

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

➢ Day 4
  Objective

  Review the topics covered throughout the week and take weekly quiz.

  ❖ Lecture

    o Review topics covered throughout the week and answer any questions. Thoroughly demonstrate how to solve challenging problems.
    o Number System
    o Expressions & Equations

Week 3: Expressions & Equations (4 days)

➢ Day 1
  Objective

  Understand ordering and absolute value of rational numbers.
  Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.

  - o Example: /interpret -3 > -7 as a statement that -3 is located to the right of -7 on a number line oriented from left to right.

  Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write –3°C > –7°C to express the fact that –3°C is warmer than –7°C.

  - ❖ Lecture
    - o Apply and extend previous understandings of numbers to the system of rational numbers.

➢ Day 2
  Objective

  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.
  - o Example: For an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars

  - ❖ Lecture

    - o Distinguish comparisons of absolute value from statements about order.
    - o Apply and extend previous understandings of numbers to the system of rational numbers.

➢ Day 3
  Objective

  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.

- ❖ Lecture

  - o Understanding Cartesian Coordinate System

- ➢ Day 4
  Objective

  Review the topics covered throughout the week and take weekly quiz.

  - ❖ Lecture
    - o Review topics covered throughout the week and answer any questions. Thoroughly demonstrate how to solve challenging problems.
    - o Expressions & Equations

Week 4: Solving one variable equations (4 Days)

Day 1

Objective

Write and evaluate numerical expressions involving whole-number exponents**;** Write, read, and evaluate expressions in which letters stand for numbers.

- ❖ Lecture:
  - ➢ PowerPoint on ways of solving one variable expressions

Day 2

Objective

Apply the properties of operations to generate equivalent expressions.
- ❖ Lecture:
  - ➢ Which Property PowerPoint
  - ➢ Properties Drill

Day 3

Objective

Represent and analyze quantitative relationships between dependent and independent variables

- ❖ Lecture: Use variables to represent two quantities in a real-world problem that change in relationship to one another

Week 5: Geometry (4 days)

Day 1

Objective

 Identify different triangles

❖ Lecture:
  ➢ PowerPoint
    ▪ Identifying different types of triangles
    ▪ How to determine which triangle is which
    ▪ Angle measurements of triangles

Day 2

Objective

Find area of right triangles

❖ Lecture:
  ➢ PowerPoint outlining steps to finding the area of triangles
  ➢ Area of trapezoids PowerPoint

Day 3

Objective

 Finding area of various shapes

❖ Lecture: Finding area of parallelograms
  ➢ PowerPoint
  ➢ Kahoots Game

Day 4

Objective

Review the topics covered throughout the week and take weekly quiz.

❖ Lecture
  ➢ Review topics covered throughout the week and answer any questions. Thoroughly demonstrate how to solve difficult problems
  ➢ Geometry

Week 6: Geometry (4 days)

Day 1

Objective

Creating and finding triangles from other shapes

❖ Lecture:
  ➢ Hands-on Activity
      ▪ Creating triangles in squares and rectangles.
      ▪ Use triangles to make various shapes and calculate area

Day 2

Objective

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 (1/2 u), and show that the volume is the same as would be found by multiplying the edge lengths of the prism.**.**

❖ Lecture: Volume of Prisms PowerPoint

Day 3

Objective

Apply the formulas V = (length) x (width) x (height) and V= (area of base) x (height) to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

❖ Lecture: Lego Volume Activity
  ➢ Calculate area of Legos and use that to find both area of classroom and the volume capacity of classroom
      ▪ Facilitator must provide dimensions of classroom

Day 4

Objective

Review

❖ Lecture: Review all Geometric Topics

Week 7: Statistics and Probability (2 days) (2 Olympics)

Day 1

<u>Objective</u>

Probability – Finding Mean, Median, & Mode

- ❖ Lecture: PowerPoint
  - ➢ Distinguishing between Mean, Median, Mode and Range
  - ➢ Understand that data sets collected to answer a statistical question have a distribution which can be described by its center, spread, and overall shape.
  - ➢ 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.

Day 2

<u>Objective</u>

Analyzing Data

- ❖ Lecture: PowerPoint outlining how to:

  - ➢ Report the number of observations.
  - ➢ Describe the nature of the attribute under investigation, including how it was measured and its units of measurement.
  - ➢ Give quantitative measures of center (median and/or mean) and variability (interquartile range).
  - ➢ Relate the choice of measures of center and variability to the shape of the data distribution and the context in which the data was gathered.

Day 3

<u>Objective</u>

Review camp curriculum

Exam

- ❖ Lecture: Post Assessment Knowledge Test
  - ➢ Test on all covered materials
  - ➢ Math Olympics Scavenger Hunt

Day 4

- ❖ Lecture:
  - ➢ Math Olympics Scavenger Hunt
  - ➢ Honors Ceremony

All curriculum content in this document was derived from the Georgia Department of Education Standards for 4th, 5th, and 6th grade.