Marietta City Schools

2023–2024 District Unit Planner

Honors Grade 6 Mathematics

Unit title	Unit 3: Investigating Rate, Ratio and Proportional Reasoning	**MYP year**	*1*	**Unit duration (hrs)**	*20 hours*

Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): ***What will students learn?***

GA DoE Standards

Standards

6.NR.4: Solve a variety of contextual problems involving ratios, unit rates, equivalent ratios, percentages, and conversions within measurement systems using proportional reasoning.

6.MP: Display perseverance and patience in problem-solving. Demonstrate skills and strategies needed to succeed in mathematics, including critical thinking, reasoning, and effective collaboration and expression. Seek help and apply feedback. Set and monitor goals.
MCS.Gifted.S3C Use a variety of strategies for solving authentic, complex, real world problems through evaluative thinking and the engineering design processes.
MCS.Gifted.S4B Recognize and examine the value of others strengths, thoughts, ideas, and feelings during collaboration.
MCS.Gifted.S4D Respectfully collaborate and effectively communicate exchanges of constructive/critical feedback.
MCS.Gifted.S6 Students will become self-directed, independent learners.

Expectations		Evidence of Student Learning (not all inclusive; see Grade Level Overview for more details)			
6.NR.4.1	Explain the concept of a ratio, represent ratios, and use ratio language to describe a relationship between two quantities.	***Strategies and Methods*** • Students should be able to solve problems involving ratios found in everyday situations. • Students should be given the opportunity to represent and explain the concept of a ratio and the relationship between two quantities using concrete materials, drawings, tape diagrams (bar models), double number line diagrams, equations, and standard fractional notation.	***Fundamentals*** • Students should be able to explain the concept of a ratio, such as using part-to-part or part-to-whole. • Students should be able to fluently use ratio language to describe a ratio relationship between two quantities. • Students should be able to identify standard fractional notation to compare.	***Example*** • The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak. • For every vote candidate A received, candidate C received nearly three votes.	
6.NR.4.2	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.	***Strategies and Methods*** • Students should be able to solve problems involving ratios found in realistic situations.			
6.NR.4.3	Solve problems involving proportions using a variety of student-selected strategies.	***Strategies and Methods*** • Students should be given opportunities to utilize student-selected strategies to solve applicable, mathematical problems involving proportions. • Students should be given the opportunity to use concrete materials, drawings, tables of equivalent ratios, tape diagrams (bar models), double number line diagrams, and equations when solving problems. • Students can choose a strategy from a variety of strategies developed to solve a specific problem depending on the situation presented in the problem.			
6.NR.4.4	Describe the concept of rates and unit rate in the context of a ratio relationship.	***Strategies and Methods*** • Students should create a table of values displaying the ratio relationships to graph ordered pairs of distances and times. • Students should write equations to represent	***Fundamentals*** • When asked practical, mathematical questions, students should demonstrate an understanding of	***Terminology*** • Students should understand a unit rate as a relationship of a:b where b = 1 ($\frac{a}{b}$ associated	***Examples*** • We paid $75 for 15 hamburgers, which is a rate of $5 per one hamburger? • In a problem involving motion at a constant speed, list and graph

		• the relationship between distance and time where the unit rate is the simple multiplicative relationship. • Students should be able to determine the independent and dependent relationship of rate relationships within authentic, mathematical situations.	simple multiplicative relationships involving unit rates.	with a ratio a: b with b ≠ 0 (b not equal to zero), and use rate language).	ordered pairs of distances and times, and write an equation such as d = 65t to represent the relationship between distance and time. In this example, 65 is the unit rate or simple multiplicative relationship.
6.NR.4.5	Solve unit rate problems including those involving unit pricing and constant speed.	***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?			
6.NR.4.6	Calculate a percent of a quantity as a rate per 100 and solve everyday problems given a percent.	***Strategies and Methods*** • Students should be able to calculate the percentage of a number using proportional reasoning developed through working with ratios and rates. • Students should be able to solve contextual problems involving finding the whole given a part and the part given the whole. • Students should determine what percent one number is of another number to solve authentic, mathematical problems.		***Fundamentals*** • Students should have opportunities to explore the concept of percentage and recognize the connection between fractions, decimal numbers, and percentages, such as, 25% of a quantity means $\frac{25}{100}$ or .25 times the quantity. • Students should be able to convert fractions with denominators of 2, 4, 5 and 10 to the decimal notation.	
6.NR.4.7	Use ratios to convert within measurement systems (customary and metric) to solve authentic problems that exist in everyday life.	***Strategies and Methods*** • Students should be able to use flexible, strategic thinking to manipulate and transform units appropriately when multiplying or dividing quantities to solve practical, mathematical problems. • Students should be able to convert measurement units when given a conversion factor within one system of measurement and between two systems of measurement (customary and metric) using proportional reasoning developed through working with ratios and rates.		***Example*** • Given 1 in. = 2.54 cm, how many centimeters are in 6 inches?	

Vocabulary: K-12 Mathematics Glossary

Percent	Ratio	Proportion	Rational Number	Quantity	Rate
Unit Rate					

Key concept	Related concept(s)	Global context
Relationships	Pattern Model System	Personal and Cultural Expression

Statement of inquiry

By examining relationships and patterns, we can make predictions in real world situations.

Inquiry questions

Factual—What information do ratios tell us about two quantities? What is a ratio? What is a rate? What is the difference between a rate and a unit rate? What kind of problems can I solve with ratios? What are percentages? What is meant by a proportional relationship?

Conceptual—

How are unit rates used to solve problems? How can we communicate proportional relationships using graphs, tables, and equations? How are percentages used in the real world?

Debatable—

What is the best way to understand ratio relationships? What would be the most useful method for communicating proportional reasoning in a real world situation?

MYP Objectives	**Assessment Tasks**	
*What specific MYP **objectives** will be addressed during this unit?*	***Relationship** between summative assessment task(s) and statement of inquiry:*	*List of common formative and summative assessments.*
MYP Criterion C: Communication	Assessments will involve students in solving real-world style problems based on the relationships found in a situation.	**Formative Assessment(s):** Unit 3 Mid-Topic **Summative Assessment(s):** MYP C: Ticket Booth Trouble Unit 3 Summative Test

Approaches to learning (ATL)
Category: Thinking **Cluster:** Critical Thinking, Creative Thinking and Transfer **Skill Indicator:** Use models and simulations to explore complex systems and issues **Category:** Social **Cluster:** Collaboration Skills **Skill Indicator:** Give and receive meaningful feedback.

Learning Experiences Add additional rows below as needed.		
Objective or Content	**Learning Experiences**	**Personalized Learning and Differentiation**
6.NR.4.1 Explain the concept of a ratio, represent ratios, and use ratio language to describe a relationship between two quantities. **6.NR.4.3** Solve problems involving proportions using a variety of students' selected strategies. **6.NR.4.4** Describe the concept of rates and unit rate in the context of a ratio relationship. **6.NR.4.5** Solve unit rate problems including those involving unit pricing and constant speed.	**Arcade Basketball Insanity** In this learning plan, students will use proportional reasoning to predict the number of basketball shots that will be made in a given amount of time. The learning goals are: 1. I can use proportional reasoning to solve problems. 2. I can determine the missing values within a proportion.	To support learning, encourage students to use a table as a model while working to determine a solution. To extend learning, students can create a similar scenario and predict what would happen in a minute using proportional reasoning.
Content Resources		
Georgia Standards Lessons and Resources website Savvas Realize online textbook Topic 5: Understanding and Use Ratio and Rate		