Marietta City Schools

District Unit Planner

Everything on the unit planner must be included on the unit curriculum approval statement.

Grade 7 Advanced Studies Mathematics

Unit title	*Unit 3- Ratios and Proportional Relationships*	**MYP year**	*2*	**Unit duration (hrs)**	*22.5 Hours*

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

GSE Standards

Standards

Analyze proportional relationships and use them to solve real-world and mathematical problems.

MGSE7.RP.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 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction (1/2)/(1/4) miles per hour, equivalently 2 miles per hour.

MGSE7.RP.2 Recognize and represent proportional relationships between quantities.

MGSE7.RP.2a 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.

MGSE7.RP.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

MGSE7.RP.2c 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.

MGSE7.RP.2d 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.

MGSE7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, and fees.

MGSE7.G.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

Concepts/Skills to be Mastered by Students

- Fractions, decimals, and percents can be used interchangeably.

- Ratios and rates use multiplication/division to represent relationships between two quantities.
- The constant of proportionality is also considered to be the unit rate.

Vocabulary

- Constant of Proportionality- In a proportional relationship, one quantity *y* is a constant multiple of the other quantity *x*. The constant multiple is called the constant of proportionality. The constant of proportionality is equal to the ratio $\frac{y}{x}$.
- Equivalent Fractions- Equivalent fractions are fractions that name the same number.
- Fraction- A fraction is a number that can be written in the form $\frac{a}{b}$, where *a* is a whole number and *b* is a positive whole number. A fraction $\frac{a}{b}$ is formed by *a* parts of size $\frac{1}{b}$.
- Multiplicative inverse- What you multiply by a number to get 1.
- Percent rate of change- The ratio of the difference in the quantity to its initial value multiplied by 100.
- Proportion- A proportion is an equation stating that two ratios are equal.
- Ratio- A ratio is a relationship in which for every *x* units of one quantity there are *y* units of another quantity.
- Unit Rate- The rate for one unit of a given quantity is called the unit rate.
- Scale factor - The scale factor is the ratio of a length in the image to the corresponding length in the original figure.

Key concept	Related concept(s)	Global context
Relationships The connections and associations between properties, objects, people and ideas.	Equivalence, Simplification	Globalization and Sustainability

Statement of inquiry

Identifying proportional relationships can help simplify decision-making.

Inquiry questions

Factual— What strategies can be used to compare ratios? What information do I get when I compare two numbers using a ratio? What conditions help to recognize and represent proportional relationships between quantities?

Conceptual— How do I interpret a unit rate (using words and mathematically)? What kinds of problems can I solve by using ratios? How is the unit rate represented in tables, graphs, equations, and diagrams? How is unit rate computed in real world problems? How are ratios and their relationships used to solve real world problems? How are proportional relationships used to solve multi-step ratio and percent problems? How do equations represent proportional relationships?

Debatable— What is the best way to represent a quantity in the real world?

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.*
Criteria A (Knowing and Understanding), Criteria B (Investigating Patterns), Criteria C (Communication), Criteria D (Applying Math to real-world context)	Students will be expected to develop proportional relationships through the analysis of graphs, tables, equations, and diagrams. Students will be expected to develop to gain a deeper understanding of scale drawing.	**Formative Assessment(s):** Unit CFA - MGSE7.RP.1 MGSE7.RP.2 MGSE7.RP.2a MGSE7.RP.2b MGSE7.RP.2c MGSE7.RP.2d **Summative Assessment(s):** Unit Assessment - MGSE7.RP.1 MGSE7.RP.2 MGSE7.RP.2a MGSE7.RP.2b MGSE7.RP.2c MGSE7.RP.2d MGSE7.RP.3, MGSE7.G.1 MYP- Scale Drawing- MGSE7.G.1
Approaches to learning (ATL)		
Category: Social **Cluster:** Collaboration Skills **Skill Indicator:** Give and receive meaningful feedback. **Category:** Thinking **Cluster:** Critical Thinking, Creative Thinking & Transfer **Skill Indicator**: Draw reasonable conclusions and generalizations		

Learning Experiences Add additional rows below as needed.		
Objective or Content	**Learning Experiences**	**Personalized Learning and Differentiation**
MGSE7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers.	Bake Sale Fundraiser This task requires students to show an understanding of operations with rational numbers. Students will determine how many cupcakes were sold and how much money is left over in their quest to develop their mathematical understanding of operations with rational numbers. Students perform operations with fractions, decimals and percents as it relates to consumer applications. This activity would fall in the Assimilation quadrant on the Rigor and Relevance Framework.	Students who are struggling will be prompted to use manipulatives and create concrete representations of the problem. Students needing extension will be prompted to confirm their answers and provide further explanation of their reasoning.
MGSE7.RP.2 Recognize and represent proportional relationships between quantities.	**Track Practice** *Illustrative Mathematics* The purpose of this task is for students to demonstrate understanding of unit rates and proportionality.	Students who are struggling will be prompted to use manipulatives and create concrete representations of the problem. Students needing extension will be prompted to confirm their answers and provide further explanation of their reasoning.
MGSE7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, and fees.	**Gotham City Taxis** *Illustrative Mathematics* The purpose of this task is to give students an opportunity to solve a multi-step ratio problem that can be approached in many ways.	Students who are struggling will be prompted to create concrete representations of the problem. Students needing extension will be prompted to confirm their answers and provide further explanation of their reasoning.
Content Resources		
Illustrative Mathematics Savvas- Topic 2 and Topic 8		