HPISD Fifth Grade TAG

UNIT NAME	ESTIMATED DURATION	9 WEEKS			
UNIT 3: PROPORTIONALITY RATIOS, RATES AND PERCENTS	**20 DAYS**	1	**2**	3	4

Unit Overview

The student applies mathematical process standards to develop an understanding of proportional relationships in problem situations.
The student applies mathematical process standards to solve problems involving proportional relationships.

Enduring Understandings

The student will understand that:	• Additive and multiplicative relationships can be expressed verbally, numerically, graphically, and symbolically in two forms. • Proportional reasoning involves both a qualitative and quantitative process. • Ratios, rates, and unit rates compare quantities represented in the real world. • Ratios can be represented with concrete models, fractions, and decimals. • Units within measurement systems can be converted using proportions and unit rates. • Constant rates of change can be determined and represented in mathematical and real-world problems. • Part of a whole is found using ratios, proportions and concrete models. • Equivalence is used to represent relationships between fractions, decimals, and percent.

Concepts

Ratio	A comparison of two quantities by division
Rate	A ratio that compares two quantities measured in different units
Unit Rate	The distance of a number from zero on a number line.
Equivalence	Any number, measure, numerical expression, algebraic expression, or equation can be represented in an infinite number of ways that have the same value.
Proportion	An equation that states that two ratios are equivalent.
Scale	The ratio between two sets of measurements
Rate of Change	A ratio that compares the difference between two output values to the difference between the corresponding input values
Metric System	A system of weights and measures that is used universally in science and commonly throughout the world
Customary System	The measurement system often used in the United States

Percent	A ratio comparing a number to 100

Guiding/Essential Questions

- How do you use ratios and rates to compare two quantities?
- How can you use ratios and rates to make comparisons and predictions?
- How do you represent, describe, and compare additive and multiplicative relationships?
- How can you use rates and proportionality to solve real-world problems?
- How can you represent real world problems involving ratios and rates with tables and graphs?
- How can you solve problems with proportions?
- How can you identify and represent proportional relationships?
- How can you use graphs to represent and analyze proportional relationships?
- How can you use ratios and proportions to convert measurements?
- How do you use percent to solve problems?
- How can you write equivalent percents, fractions, and decimals?

Learning Targets & Progressions

- **Students will develop an understanding of ratios, rates, unit rates, and proportions.**
  - Calculate unit rates from rates
  - Make predictions involving ratios and rates
  - Understand that ratios and rates compare two quantities
  - Differentiate between additive and multiplicative relationships
  - Equivalent ratios
  - Cross multiplication
  - Represent ratios with concrete models and fractions
- **Students will use ratios, rates, and unit rates to compare quantities.**
  - Understanding Inequalities
  - Equivalency/Simplification
- **Students will apply qualitative and quantitative reasoning to solve prediction and comparison of real-world problems involving ratios, rates, and proportions.**
  - Represent constant rates of change in real-world problems
  - Represent real world problems involving ratios and rates with tables and graphs
- **Students will convert units within measurement systems.**
  - Metric and customary system of measurement
  - Powers of 10
- **Students will relate fractions, decimals, and percent and generate equivalent forms to solve real-world problems involving percent.**
  - Solve problems to find the whole or part of the whole
  - Find percent of a number
  - Benchmark fractions of 1%, 10%, 25%, 33 1/3%, and multiples of these values
  - Express fractions, decimals, and percent using multiple representations
  - Generate equivalent forms of fractions, decimals, and percent

Formative Assessments	Summative Assessments

TEKS: Readiness Standards	TEKS: Supporting Standards
6.4B apply qualitative and quantitative reasoning to solve prediction and comparison of real-world problems involving ratios and rates **6.4G** generate equivalent forms of fractions, decimals, and percent using real-world problems, including problems that involve money **6.4H** convert units within a measurement system, including the use of proportions and unit rates **6.5B** solve real-world problems to find the whole given a part and the percent, to find the part given the whole and the percent, and to find the part given the part and the whole, including the use of concrete and pictorial models	**5.7A** solve problems by calculating conversions within a measurement system, customary or metric **6.4A** compare two rules verbally, numerically, graphically, and symbolically in the form of $y=ax$ or $y=x+a$ in order to differentiate between additive and multiplicative relationships **6.4C** give examples of ratios as multiplicative comparisons of two quantities describing the same attributes **6.4D** give examples of rates as the comparison by division of two quantities having different attributes, including rates as quotients **6.4E** represent ratios and percent with concrete models, fractions, and decimals **6.4F** represent benchmark fractions and percent such as 1%, 10%, 25%, 33 1/3%, and multiples of these values using 10 by 10 grids, strip diagrams, number lines, and numbers **6.5A** represent mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions **6.5C** use equivalent fractions, decimals, and percent to show equal parts of the same whole

TEKS Process Standards

5.1A/6.1A apply mathematics to problems arising in everyday life, society, and the workplace
5.1B/6.1B use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution
5.1C/6.1C select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems
5.1D/6.1D communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate
5.1E/6.1E create and use representations to organize, record and communicate mathematical ideas
5.1F/6.1F analyze mathematical relationships to connect and communicate mathematical ideas
5.1G/6.1G display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication

Processes and Skills: What students should be able to DO	Facts: What students should KNOW
• Compare two rules in a variety of methods in the form of $y=ax$ or $y=x+a$ to differentiate between additive and multiplicative relationships • Make predictions involving ratios and rates • Express fractions, decimals, and percent using multiple representations	• Ratios and rates compare two quantities • Metric and customary system of measurement • Benchmark fractions of 1%, 10%, 25%, 33 1/3%, and multiples of these values

• Generate equivalent forms of fractions, decimals, and percent • Convert within systems of measurement • Represent constant rates of change in real-world problems • Calculate unit rates from rates	
Topics	
Constant Rate of Change Measurement Conversions Proportions Percent	Rates Ratios Unit Rates
Language of Instruction	
(all units of length, mass, and capacity) (all units of length, mass, and capacity) Customary System Decimal Equivalent Ratios Fraction Metric System Percent	Proportion Proportionality Rates Ratios Relationships Unit Rates Total of 100
State Assessment Connections	**National Assessment Connections**
Resources	
HMH, Texas Go Math! Unit 3 Page 175-262	