Ratios and Rates Family Letter

Dear Family,

In this module, ***Ratios and Rates***, students will use their prior knowledge of fractions and fraction equivalence to develop understanding of ratios and rates. Ratio and proportional reasoning is a foundational topic for middle school mathematics, with applications in algebra, geometry, probability, statistics, and everyday life!

What Did Students Learn Previously?

In elementary grades, students developed the concept of a fraction representing part of a whole, and understood fraction equivalence.

For example, the fraction $\frac{3}{4}$ represents *three parts* out of a whole of *four parts*.

The fraction $\frac{3}{4}$ is equivalent to many other fractions, including $\frac{6}{8}$, $\frac{9}{12}$, and $\frac{12}{16}$.

What Will Students Learn in This Module?

Ratios and Equivalent Ratios

- Students will apply and extend their understanding of fractions to develop foundational understanding of **ratios** and ratio reasoning.
- In the bar diagram, the ratio of the shaded part of the diagram is 3 to 4 (3 parts shaded to 4 total parts).

3 : 4

- There are multiple ways to express both part-to-whole and part-to-part ratios, including models, words, and ratio notation (3 : 4).
- Students will use their understanding of fraction equivalence to find ratio equivalence, and find **equivalent ratios**. The bar diagrams show that 6 : 8 and 3 : 4 are equivalent ratios, similar to how $\frac{3}{4}$ and $\frac{6}{8}$ are equivalent fractions.

6 : 8

- There are multiple ways, such as **bar diagrams**, **double number lines**, **ratio tables**, and **graphs** to find and represent equivalent ratios.
- Ratio reasoning can be used to solve problems that arise in everyday life, including converting measurements, such as inches to yards.

Rates and Unit Rates

- A **rate** is a special kind of ratio that compares quantities with different units, such as 240 miles in 6 hours.

- A **unit rate** compares one quantity (miles) to 1 unit of the second quantity (hours), such as 40 miles per hour.
- Unit rates, including **unit prices**, can be used to solve problems in everyday life.

What Vocabulary Terms Will Students Use?

Term	Definition
ratio	A comparison between two quantities, in which for every *a* units of one quantity, there are *b* units of another quantity.
part-to-whole ratio	A ratio that compares one part of a group to the whole group.
part-to-part ratio	A ratio that compares one part of a group to another part of the same group.
equivalent ratios	Ratios that express the same ratio relationship between the two quantities.
ratio table	A collection of equivalent ratios that are organized in a table.
scaling	The process of multiplying each quantity in a ratio by the same number to obtain an equivalent ratio.
double number line	Two number lines, in which the coordinated quantities are equivalent ratios.
unit ratio	A ratio in which the first quantity is compared to 1 unit of the second quantity.
rate	A special kind of ratio in which the units are different.
unit rate	A rate in which the first quantity is compared to 1 unit of the second quantity.
unit price	The cost per 1 unit of an item.

How You Can Provide Support

1. Support your child's understanding of ratios and rates by asking them to explain how they can use ratio reasoning to solve problems in everyday life.
   - *Recipes:* Find the quantities of ingredients needed for a recipe if you need to make 2 batches, or half a batch.
   - *Unit rates:* Find the average unit rate, in miles per hour, for an upcoming road trip if you give them the total distance and time traveled.
   - *Unit price:* Compare the unit prices of two items, such as the cost per ounce of two different boxes of cereal. Ask which is the better buy.
2. Encourage your child to have a positive, growth-oriented attitude towards mathematics and their learning.
   - Encourage them to ask questions – both at home and in class. Sometimes, an answer to a question will generate more questions. That's how you know they are learning!
   - Encourage your child to embrace challenges and remind them that every challenge is an opportunity to learn something new.
   - Celebrate successes – both small and large.
3. Contact me to arrange a time to discuss the specifics of your child's performance and how we can work together to help them succeed in this module.

Sincerely,

_____ _____

(Teacher's Name) (Email/Phone)