***Proportional Relationships*  Family Letter**

**Dear Family,**

In this module, ***Proportional Relationships***, students will use their prior knowledge of ratios and rates to develop understanding of proportional relationships. 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 a previous grade, students used rate and ratio reasoning to solve real-world and mathematical problems.

For example, a basketball player made 3 out of every 5 free throws during a game. By using ratio reasoning, such as bar diagrams, double number lines, or tables, students determined that the basketball player made 21 out of 35 free throws, because *3 out of 5* and *21 out of 35* are equivalent ratios.

**What Will Students Learn in This Module?**

**Proportional Relationships**

* Students will apply and extend their understanding of ratios and rates to develop foundational understanding of **proportional relationships**.
* In the bar diagram, four pounds cost a total of $16. This means that each pound costs $4. The unit rate is $4 per pound.
* In order for a relationship to be in a **proportional relationship**, the second unit rate must also be $4 per pound.
* In this second bar diagram, eight pounds cost a total of $32. This means that each two-pound section costs $8. By using rate reasoning, this means that each pound costs $4. Because the ratios were maintained, this is a proportional relationship.
* Proportional relationships can be shown in tables, graphs, and equations. In each representation, the constant ratio (or **constant of proportionality**) must be maintained.

**Proportions**

* A proportion is an equation stating that two ratios are equivalent, for example  . Because each ratio is equivalent to , or 4 to 1, this is a proportion.
* Students will solve problems involving proportional relationships using words, ratio tables, graphs, or equations.

**What Vocabulary Terms Will Students Use?**

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| **Term** | **Definition** |
| **constant of proportionality** | The constant ratio in a proportional relationship. It has the same value as the unit rate. |
| **nonproportional** | Two quantities are nonproportional if the ratios comparing them are not equivalent. |
| **proportion** | An equation stating that two ratios are equivalent. |
| **proportional** | Two quantities are proportional if the ratios comparing them are equivalent. |
| **proportional relationship** | Two quantities that vary and have a constant ratio between them. |
| **unit rate** | A comparison of a first quantity per every 1 unit of a second quantity. |

**How You Can Provide Support**

1. Support your child’s understanding of proportional relationships by asking them to explain how they can use proportions to solve problems in everyday life.
	* *Shopping:* Find the total cost of a certain number of items, such as oranges, based on the cost of two of the items.
	* *Driving:* Find the distance traveled in 3 hours if the speed you traveled was constant.
	* *Home Improvement:* Find the number of gallons of paint needed to cover the four walls of a room given the number of square feet one gallon of paint covers.
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,

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(Teacher’s Name) (Email/Phone)