Dear Family,

Next, in your child's mathematics class is *Comparing and Scaling: Developing Proportional Reasoning in the Context of Number (Quantities).* Students work within many different problem situations to make comparisons using ratios, rates, and percents. Students explore these concepts by making sense of surveys, scaling recipes for different numbers of people, analyzing prices for better deals, and calculating tax.

UNIT GOALS
The goal is for students to: **Understand how to use proportionality to solve problems**.

This Unit has two broad goals. One is to help students develop the ability to compare quantitative information by using ratios, rates, unit rates, and percents. Another is to encourage students to use those comparisons to scale rates and ratios up and down to find equivalent ratios.

Additionally, in this Unit students will learn different ways of reasoning in proportional situations, as well as how to recognize when such reasoning is appropriate. Students will connect how unit rate, or the constant of proportionality, is represented algebraically in graphs, tables, and equations.

HOMEWORK and HAVING CONVERSATIONS ABOUT THE MATHEMATICS
You can help with homework and encourage sound mathematical habits during this Unit by asking questions such as:
- *What is a ratio or rate?*
- *How can you scale a ratio up or down?*
- *How can you use proportions to solve problems?*

You can help your child with his or her work for this Unit in several ways:

- Ratios, proportions, and percents are everywhere. When you see one of these concepts in a newspaper or magazine, point it out to your child. Discuss with your child what information the numbers give about the situation.

- If you keep track of your car mileage, you may want to share this with your child. If you use other modes of transportation, such as a bus or subway, you may want to discuss the cost of the transportation per week, per month, and per year.

- Ask your child to pick a question in the Unit that was interesting to him or her. Discuss the question together.

In your child's notebook, you can find completed examples, notes taken in class on the mathematics of the Unit, and descriptions of the vocabulary words.

COMMON CORE STATE STANDARDS
Students develop and use all of the Standards of Mathematical Practice throughout the curriculum. In *Comparing and Scaling*, students spend significant time reasoning abstractly and quantitatively. *Comparing and Scaling* focuses largely on reasoning with ratios, rates, equivalence, and percents.

A few important mathematical ideas that your child will learn in *Comparing and Scaling* are on the next page. As always, if you have any questions or concerns about this Unit or your child's progress in the class, please feel free to call.

Sincerely,

Important Concepts	Examples
Ratio A comparison of two quantities. A ratio is a multiplicative comparison. Ratios can be written in fraction form, but they do not represent fractions.	For every 6 cups of flour you use 2 cups of sugar. Ratios are written in several forms. Some common ways are 6 flour to 2 sugar, 6 to 2, 6:2, or $^6/_2$.
Two Types of Ratios Ratios can be *part-to-part* or *part-to-whole* comparisons.	Suppose a survey finds that 50 students prefer sandwiches and 100 prefer pizza for lunch. A part to part comparison might be: For every 50 students who want sandwiches there are 100 who want pizza. A part to whole comparison might be: There are 100 students out of 150 who prefer pizza for lunch.
Rate A rate is a special kind of ratio. All the ways of working with ratios also apply to rates. *A rate is a comparison of two different units* e.g miles per hour, or dollars per gallon etc.	Examples include; miles per gallon, sandwiches per person, dollars for each hour, calories to ounces, kilometers to hours.
Unit Rate or Constant of Proportionality Unit rate is a special ratio, where one of the quantities is 1. There are two unit rates for every ratio.	With a recipe that calls for 2 cups sugar for every 5 cups of flour. Unit Rate: 1 cup of sugar needs 2.5 cups of flour Unit Rate: 1 cup of flour needs 0.4 cup of sugar
Percents A part-to-whole comparison that uses 100 as the whole. A percent tells you the rate of some quantity for every 100. Percent problems are examples of proportional situations since every percent is a ratio P:100.	Sara got 45 points correct out 50 point on a test. Students might scale the ratio: 45 out of 50 is like, 90 points correct out 100 points, or 90% OR Students might think visually: 0 points 45 points 50 points 0 % 95% 100 %
Proportions A proportion is a statement of equality between two ratios.	Kendra takes 70 steps on the treadmill to run 0.1 mile. When her workout is done, she has run 3 miles. How many steps has she taken? Proportion: $\dfrac{70 \text{ steps}}{0.1 \text{ mile}} = \dfrac{x \text{ steps}}{3 \text{ miles}}$ $\dfrac{70 \text{ steps} \times 30}{0.1 \text{ miles} \times 30} = \dfrac{21{,}00 \text{ steps}}{3 \text{ miles}}$ Solution of the proportion
Scaling Ratios (and Rates and Percents) Using factor and multiple relationships to find equivalent ratios.	×42 $\dfrac{1}{5} = \dfrac{x}{210}$ Number of Batches / Number of Servings ×42 ÷5 ×100 $\dfrac{5 \text{ total cups}}{2 \text{ concentrate cups}} = \dfrac{1}{0.4} = \dfrac{100 \text{ total}}{40 \text{ concentrate}}$ or 40% ÷5 ×100 Unit Rate Unit Rate scaled to find a ratio with a quantity of 100