Dear Family,

The Grade 7 students are beginning to study *Unit 3: Rational Number Operations*. Here is a little information about what your student will be learning in this unit.

**What is the Focus of this Unit?**

This unit builds upon background knowledge in basic operations to include all rational numbers. Rational numbers will include integers, decimals, and fractions. At the end of this unit, students will be able to:

* Interpret products of rational numbers by describing real-world contexts.
* Identify situations when integers can and cannot be divided.
* Use words and real-world contexts to explain why the quotient of two integers is a rational number.
* Identify and apply properties used when multiplying and dividing rational numbers.
* Convert a rational number to a decimal using long division.
* Identify terminating or repeating decimal representations of rational numbers.
* Solve real-world and mathematical problems involving the four operations with rational numbers.

**What are the mathematical practice expectations for my student?**

* **Make sense of problems and persevere in solving them.** Students explain and demonstrate rational number operations by using symbols, visuals, words, and real life contexts. Students demonstrate perseverance while using a variety of strategies (number lines, manipulatives, drawings, etc.).
* **Reason abstractly and quantitatively.** Students demonstrate quantitative reasoning by representing and solving real-world situations using visuals, numbers, and symbols. They demonstrate abstract reasoning by translating numerical sentences into real world situations.
* **Construct viable arguments and critique the reasoning of others.** Students will discuss rules for operations with rational numbers using appropriate terminology and tools/visuals. Students apply properties to support their arguments and constructively critique the reasoning of others while supporting their own position.

**How does this look different than what may have been taught in the past before the transition to the New Illinois Learning Standards for Mathematics?**

Students have previously worked with ratio concepts and reasoning. This unit will build upon their experience to include proportional relationships and problem solving. Students will use tape diagrams, double line graphs, tables, graphs, and other models to explore and understand these concepts in real world contexts.

Students will be expected to work independently as well as in small groups throughout this unit. The ideas within this unit will focus on making sense of problems and persevering in solving them, justifying answers through conversations and reasoning, critiquing the work of others, modeling in mathematics, and attending to precise mathematical language.

Here are two examples of the types of problems your student will be studying:

* Use a number line to write an addition/subtraction expression that describes this situation. Then, find the answer and explain its meaning. A hot air balloon rises 220 feet into the air, and then it descends 105 feet.
* Use words and visuals to explain and solve the expression: (-5) • (+3)
* Carol wants to paint the hallway. The hallway measures 70 x 15 feet. If each gallon of paint covers 200 square feet and costs $24, how much money will she spend on paint?

**How will my student apply what he/she learns in the future?**

Students will apply these concepts of proportional relationships between quantities to situations involving multi-step ratio and percent problems as well as scale drawings in real world contexts.

**How can I help my student at home?**

One of the most important things you can do at home is to ask your student to explain the models he/she is creating or interpreting. By explaining the models, students share their understanding of the mathematics abd their ability to communicate their knowledge to others.

For example, ask them to describe the change in temperature using the terms positive, negative, gain, and loss. Ask them to compute the balance in a bank account.

**What are some vocabulary terms that will be addressed?**

Commutative Property – Changing the order of the numbers in the problem does not change the resulting answer. For example 2 + 3 = 5 and 3 + 2 = 5

Distributive Property – Distribute the factor that is outside the parentheses through the numbers inside the parentheses. For example 2(3 + 4) = 2x3 + 2x4

Integers - The set of whole numbers and their opposites. Whole numbers greater than zero are called positive integers. Whole numbers less than zero are called negative integers. The integer zero is neither positive nor negative, and has no sign.

Negative Numbers – A real number that is less than zero.

Opposites – A number is the number that is on the opposite side of zero. For example, the opposite of 6 is -6.

Positive Numbers – A real number that is greater than zero.

Income/Profit – An amount that is gained.