MATHEMATICAL IDEAS & CONCEPTS:

- Continue to understand place value system
- Continue to perform operations with multi-digit whole numbers and with decimals to hundredths
- Continue to develop strategies to add and subtract fractions
- Fluently multiply multi-digit whole numbers using base-ten strategies
- *Analyze patterns and relationships* by graphing points on a coordinate plane *(new this quarter)*
- Continue to represent and interpret data using line plots

ESSENTIAL QUESTIONS:

1. *How is my strategy related to the numbers within the problem?*
2. *How can I extend my strategies of whole number operations to decimal operations?*
3. *How can I be strategic and accurate when adding and subtracting fractions?*

STANDARDS:

Aligned to Essential Questions; Big Idea/Concept Standard (★) with supporting standards (➔) connected below

Notes in gray font are from the AR Mathematics standards; RPS instructional pacing notes are in red font

EQ 1: How is my strategy related to the numbers within the problem?

★ **5.NBT.B.6**

- Find whole-number *quotients* of *whole numbers* with up to four-digit *dividends* and two-digit *divisors*, using strategies based on:
  - *Place value*
  - The properties of operations
  - Divisibility rules; and
  - The relationship between multiplication and division
- Illustrate and explain calculations by using *equations*, *rectangular arrays*, and area models

Note: Focus on being strategic (choosing appropriate strategies based on number sets)

➔ **5.NBT.B.5** Fluently (efficiently, accurately and with some degree of flexibility) multiply multi-digit *whole numbers* using a standard *algorithm.*

This standard is connected to promote the relationship between multiplication and division and to help students identify similarities in strategies through operations.

Q4 Expectation: Fluency with algorithms based on place value/base-ten.

Notes 5.NBT.B.5:

- *A standard algorithm can be viewed as, but should not be limited to, the traditional recording system.*
- *A standard algorithm denotes any valid base-ten strategy.*

EQ 2: How can I extend my strategies of whole number operations to decimal operations?

★ **5.NBT.B.7** *Q4 focus: use of variety of strategies to operate with decimals (models and drawings are still appropriate)*
Perform basic operations on decimals to the hundredths place:

- Add and subtract decimals to hundredths using concrete models or drawings and strategies based on *place value*, properties of operations, and the relationship between addition and subtraction
- Multiply and divide decimals to hundredths using concrete models or drawings and strategies based on *place value*, properties of operations, and the relationship between multiplication and division

★ **5.NBT.A.2** Understand why multiplying or dividing by a power of 10 shifts the *value* of the digits of a whole number or decimal:

- Explain patterns in the number of zeros of the *product* when multiplying a whole number by powers of 10
- Explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10
- Use whole-number *exponents* to denote powers of 10

Q4 Focus: Continue to focus on applying the multiplicative pattern to multiply and divide

EQ 3: How can I be strategic and accurate when adding and subtracting fractions?

When performing operations with fractions at this grade level, the use of visual models to represent fractions is considered a proficient practice.
End of year expectations include using visual fraction models and/or equations.

★ **5.NF.A.2** *Q4 progresses to experiences involving one denominator that is NOT a factor of the other denominator Ex: ⅓ + ¼ = n*

- Solve word problems involving addition and subtraction of *fractions* referring to the same whole, including cases of unlike *denominators*. *For example:* Use *visual fraction models* or *equations* to represent the problem.
- Use benchmark *fractions* and number sense of *fractions* to estimate mentally and assess the reasonableness of answers. *For example:* Recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.

➔ **5.NF.A.1** Efficiently, accurately, and with some degree of flexibility, add and subtract *fractions* with unlike *denominators* (including mixed numbers) using equivalent *fractions* and common *denominators* *For example:* Understand that 2/3 + 5/4 = 8/12 + 15/12 = 23/12 (In general, a/b + c/d = (ad + bc)/bd) *Q4: students should be relying less on the use of visual models to generate equivalent fractions*
Note: 5.NF.A.1 The focus of this standard is applying equivalent fractions, not necessarily finding least common denominators or putting results in simplest form.

Application of the following standards will be seen throughout most of your mathematical experiences:

- **5.OA.A.1** Use *grouping symbols* including parentheses, brackets, or braces in numerical *expressions*, and evaluate *expressions* with these symbols. *Note: 5.OA.A.1 Expressions should not contain nested grouping symbols such as [4+2(10+3)] and they should be no more complex than the expressions one finds in an application of the associative or distributive property (e.g., (8+7) x2 or {6 X 30} + {6 X 7}).*

- **5.OA.A.2** Write simple *expressions* that record calculations with numbers, and interpret numerical *expressions* without evaluating them.
  For Example: Express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated *sum* or *product.*

Additional Standards:

- **5.OA.B.3**
  - Generate two numerical patterns, each using a given rule.
  - Identify apparent relationships between corresponding terms by completing a function table or input/output table.
  - Using the terms created, form and graph ordered pairs in the first quadrant of the *coordinate plane.*
  - **5.G.A.1** *Note 5.G.A.1: Graphing will be limited to the first quadrant and the non-negative x- and y-axes only.*
    - Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the *origin*) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its *coordinates.*
    - Understand that the first number indicates how far to travel from the *origin* in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the *coordinates* correspond (e.g., *x*-axis and *x*- coordinate, *y*-axis and *y*-coordinate).
  - **5.G.A.2**
    - Represent real world and mathematical problems by graphing points in the first quadrant and on the nonnegative *x*- and *y*-axes of the *coordinate plane.*
    - Interpret coordinate values of points in the context of the situation

- **5.MD.B.2**
  - Make a *line plot* to display a data set of measurements in *fractions* of a unit (1/2, 1/4, 1/8)
  - Use operations on *fractions* for this grade to solve problems involving information presented in *line plots*
    For example: Given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally. Given different measurements of length between the longest and shortest pieces of rope in a collection, find the length each piece of rope would measure if each rope's length were redistributed equally or other examples that demonstrate measures of center (*mean*, *median*, *mode*).