MATHEMATICAL IDEAS & CONCEPTS:

- Continue to represent and solve problems involving multiplication and division
- Continue to solve two-step word problems involving addition and subtraction
- Continue to add and subtract within 1000
- Understand place value *new this quarter*
- Continue to develop understanding of fractions
- Solve problems involving time *new this quarter*
- Reason with shapes and their attributes *new this quarter*
- Represent and interpret data *new this quarter*

ESSENTIAL QUESTIONS:

1. *How are multiplication and division related?*
2. *How can I use notation to represent my strategies for addition and subtraction?*
3. *How can I build four-digit numbers in more than one way?*
4. *How can a fraction be represented in a variety of ways?*
5. *How can shapes belong to multiple categories?*

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

★ **3.OA.D.8** Solve two-step word problems using the four operations, and be able to:
- Represent these problems using *equations* with a letter standing for unknown quantity
- Assess the reasonableness of answers using mental computation and estimation strategies including rounding

Q2 Focus: addition/subtraction; multiplication/division involving facts of 2, 5, and 10

Note: 3.OA.D.8 This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in conventional order when there are no parentheses to specify a particular order (Order of Operations).

***This standard is not listed with a specific essential question because it should be embedded throughout all aspects of their mathematical work this year.*

EQ 1: How are multiplication and division related?

★ **3.OA.A.3** Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities (e.g., by using drawings and *equations* with a symbol for the unknown number to represent the problem)

➔ **3.OA.A.1** Interpret *products* of *whole numbers* (e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each)
For example: Describe a context in which a total number of objects can be expressed as 5 × 7.

➔ **3.OA.A.2** Interpret whole-number *quotients* of *whole numbers* (e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each)
For example: Describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8

➔ **3.OA.A.4** Determine the unknown whole number in a multiplication or division equation relating three *whole numbers* *new this quarter*
For example: Determine the unknown number that makes the equation true in each of the *equations* 8 × ? = 48; 5 = _ ÷ 3; 6 × 6 = ?

➔ **3.OA.B.6** Understand division as an unknown-factor problem. *new this quarter*
For example: Find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8

Standards associated with this essential standard continue on next page…

EQ 1: How are multiplication and division related? continued…

★ **3.OA.C.7** *Q2 Expectation: Fluency with 0, 1, 3, and 4 facts; Maintain fluency with 2, 10, 5 facts*

- Using *computational fluency*, multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations
- By the end of Grade 3, automatically (*fact fluency*) recall all *products* of two one-digit numbers

Note: 3.OA.C.7 Computational fluency is defined as a student's ability to efficiently and accurately solve a problem with some degree of flexibility with their strategies

➔ **3.OA.B.5** Apply properties of operations as strategies to multiply and divide. *Note: 3.OA.B.5 Students are not required to use formal terms for these properties.*

For example:

- If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known (*Commutative property of multiplication*).
- 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30 (*Associative property of multiplication*).
- Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56 (*Distributive property*)

EQ 2: How can I use notation to represent my strategies for addition and subtraction?

★ **3.NBT.A.2** Using *computational fluency*, add and subtract within 1000 using strategies and *algorithms* based on *place value*, properties of operations, and the relationship between addition and subtraction.

Note: 3.NBT.A.2 Computational fluency is defined as a student's ability to efficiently and accurately solve a problem with some degree of flexibility with their strategies.

➔ **3.NBT.A.1** Use *place value* understanding to round *whole numbers* to the nearest 10 or 100.

EQ 3: How can I build four-digit numbers in more than one way?

★ **3.NBT.A.4** Understand that the four digits of a four-digit number represent amounts of thousands, hundreds, tens, and ones (e.g., 7,706 can be portrayed in a variety of ways according to *place value* strategies). *new this quarter*

Understand the following as special cases:

- 1,000 can be thought of as a group of ten hundreds---called a thousand
- The numbers 1,000, 2,000, 3,000, 4,000, 5,000, 6,000, 7,000, 8,000, 9,000 refer to one, two, three, four, five, six, seven, eight, or nine thousands

➔ **3.NBT.A.5** Read and write numbers to 10,000 using base-ten numerals, number names, and *expanded form(*s). *new this quarter*

For example:

- Using base-ten numerals "standard form" (347)
- Number name form (three-hundred forty seven)
- *Expanded form*(s) (300 + 40 + 7 = 3 × 100 + 4 × 10 + 7 × 1)

*Q2 Focus: multiple experiences using models and manipulatives to **build** four-digit numbers in a variety of ways*

EQ 4: How can a fraction be represented in a variety of ways?

Note: Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8

★ **3.NF.A.1**

- Understand a *fraction* 1/*b* as the quantity formed by 1 part when a whole is partitioned into *b* equal parts. *For example:* Unit fractions are fractions with a numerator of 1 derived from a whole partitioned into equal parts and having 1 of those equal parts (¼ is 1 part of 4 equal parts).
- Understand a *fraction a*/*b* as the quantity formed by *a* parts of size 1/*b*. *For example:* Unit fractions can be joined together to make non-unit fractions (¼ + ¼ + ¼ = ¾).

➔ **3.G.A.2**

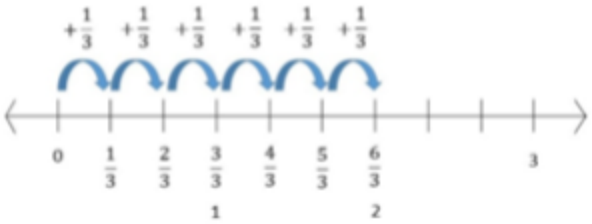
- Partition shapes into parts with equal areas
- Express the area of each part as a *unit fraction* of the whole. *For example:* Partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.

★ **3.NF.A.2** Understand a *fraction* as a number on the number line; represent *fractions* on a *number line diagram:* *new this quarter*

- Represent a *fraction* 1/*b* on a *number line diagram* by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts
- Recognize that each part has size 1/*b* and that the endpoint of the part based at 0 locates the number 1/*b* on the number line *(see example 1)*
- Represent a *fraction a*/*b* on a *number line diagram* by marking off a lengths 1/*b* from 0
- Recognize that the resulting interval has size *a*/*b* and that its endpoint locates the number *a*/*b* on the number line *(see example 2)*

Example 1

Example 2



★ **3.NF.A.3** Explain equivalence of *fractions* in special cases and compare *fractions* by reasoning about their size: *new this quarter; formally assessed in Q3/Q4*

- Understand two *fractions* as equivalent (equal) if they are the same size or the same point on a number line
- Recognize and generate simple equivalent *fractions* (e.g., 1/2 = 2/4, 4/6 = 2/3)
- Explain why the *fractions* are equivalent (e.g., by using a *visual fraction model*)
- Express *whole numbers* as *fractions* and recognize *fractions* that are equivalent to *whole numbers* (e.g., Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a *number line diagram*)
- Compare two *fractions* with the same *numerator* or the same *denominator* by reasoning about their size. Recognize that comparisons are valid only when the two *fractions* refer to the same whole. Record the results of comparisons with symbols (>, =, <) and justify the conclusions (e.g., by using a *visual fraction model*)

EQ 5: How can shapes belong to multiple categories?

★ **3.G.A.1** *new this quarter*

- Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share *attributes* (e.g., having four sides) and that the shared *attributes* can define a larger category (e.g., quadrilaterals)
- Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories

Additional Standards:

➔ **3.MD.A.1** *Q2 Focus: measuring time intervals and solving problems involving elapsed time*

- Tell time using the terms quarter and half as related to the hour (e.g., quarter-past 3:00, half-past 4:00, and quarter till 3:00) *Connect to fractional understandings (NF.A.1, NF.A.2)*
- Tell and write time to the nearest minute and measure time intervals in minutes
- Solve word problems involving addition and subtraction of time intervals in minutes (e.g., by representing the problem on a *number line diagram*)

➔ **3.MD.B.3** *new this quarter*

- Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories (e.g., Draw a bar graph in which each square in the bar graph might represent 5 pets)
- Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled picture graphs and scaled bar graphs