Chapter 2 - Overview & Support
Fractions

Standards: 6.NS.2, 6.NS.3, 6.NS.4

Compute fluently with multi-digit numbers and find common factors and multiples.

6.2. Fluently divide multi-digit numbers using the standard algorithm.

6.3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each lesson.

6.4. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4 (9 + 2).

Suggested Routines:

Number Talks - Fractions, Decimals, and Percentages

a. Chapter 8: Number Talks for Multiplication with Fractions
b. Chapter 9: Number Talks for Division with Fractions

Math on the Spot (online resource)
Personal Math Trainer (online resource)

Suggested Resources

The following resources will help students build their fractional number sense:

Christina Tondevold: https://buildmathminds.com/

Graham Fletcher: https://gfletchy.com/3-act-lessons

Steve Wyborney: https://www.stevewyborney.com/

Robert Kaplinsky: https://robertkaplinsky.com/resources

Estimation 180 Andrew Stadel: http://www/estimation180.com

- https://gfletchy.com/the-kool-aid-kid/
- https://gfletchy.com/the-apple/
- https://tasks.illustrativemathematics.org/content-standards/6/NS/B/standards

(Visual Activities)

Framework: http://blogs.egusd.net/mathgen/files/2015/09/Grade-6-13p8rai.pdf

Manipulatives:

- Fraction tiles
- Counters

Vocabulary:

mixed number	simplest form	equivalent fractions	common denominator
benchmark	compatible numbers	reciprocal	multiplicative inverse

Strategies for Chapter:

- Convert, compare, order
  - Number lines
  - Bar Models
- multiply, and model fractions
  - Bar Models
- Simplify using GCF
- Model division of fractions
  - Bar models
- Use compatible numbers to estimate quotients of fractions and mixed numbers

Color Coding:

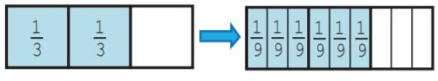
Green (G)- The lesson accurately reflects the Framework standard(s).
Yellow (Y) - This lesson includes notes to refer to while planning the lesson.
Red (R) - This lesson does not accurately reflect the Framework standard(s). Skip the lesson.

Essential Question:

How can you use the relationship between multiplication and division to divide fractions?

Lesson-by-Lesson Overview:

Lesson #, Standard	Title	Materials	Vocab	Notes
Show What You Know	Fractions			Review 5th grade fraction skills.
2.1 Y 6.NS.6c	Fraction and decimals	Student white boards	Mixed number, Simplest form, terminating decimal, repeating decimal	This lesson does not address the standard identified as written. Need more emphasis on placement of rational numbers on a number line. This lesson is a review of 5th grade standards and a way of to support the work of Lesson 2.2. Use Long Division to convert a fraction to a decimal
2.2 Y 6.NS.6c	Compare and Order Fractions and Decimals	Student white boards	Equivalent fractions, Common denominator	Number Talks: pg.125 ● Connect to place value, fraction and decimals

				Strategies used to demonstrate comparison: number lines, fraction models, benchmark numbers, Tape diagram/Bar Model for common denominators, benchmark fractions, and use of decimals
2.3 Y 6.NS.4	Multiply Fractions	Student White Board Fraction tiles Counters	Benchmark	Review addition and subtraction of fraction strategies Review equivalent fractions Review order of operations Decompose the fraction
2.4 G 6.NS.4	Simplify Factors	Student White boards Fraction Strips		Use the Distributive Property and decomposition to simplify fractions. Ladder Method - Framework http://blogs.egusd.net/mathgen/files/2015/09/Grade-6-13p8rai.pdf **Example: Ladder Method for Finding the GCF and LCM** 6.NS.4 To find the LCM and GCF of 120 and 48, one can use the "ladder method" to systematically find common factors of 120 and 48 and identify the factors that 120 and 48 do not have in common. The GCF becomes the product of all those factors that 120 and 48 share, and the LCM is the product of the GCF and the remaining uncommon factors of 120 and 48. With the ladder method, common factors (3, 4, 2 in this case) are divided from the starting and remaining numbers until there are no more common factors to divide (5, 2). The GCF is then $3 \cdot 4 \cdot 2 = 24$, and the LCM is $24 \cdot 5 \cdot 2 = 240$. *Note:* The grade-six standard requires only that students find the GCF of numbers less than or equal to 100 and the LCM of numbers less than or equal to 12. Common Factors / Remaining Numbers: 3 → 120, 48; 4 → 40, 16; 2 → 10, 4; 5, 2
Mid Chapter Checkpoint				
2.5 G 6.NS.1	Investigate Model fraction Division	Fraction strips/tiles Student Whiteboard		Use bar models and fraction strips to help students conceptualize division of fractions. **Examples: Division Reasoning with Fractions** 6.NS.1▲ 1. Three people share $\frac{2}{3}$ of a pound of watermelon. How much watermelon does each person get? *Solution:* This problem can be represented by $\frac{2}{3} \div 3$. To solve it, students might represent the watermelon with a diagram such as the one below. There are two $\frac{1}{3}$-pound pieces represented in the picture. Students can see that $\frac{1}{3}$ divided among three people is $\frac{1}{9}$. Since there are 2 such pieces, each person receives $\frac{2}{9}$ of a pound of watermelon.  Problems like this one can be used to support the fact that, in general, $\frac{a}{b} \div c = \frac{a}{b} \times \frac{1}{c}$.

				Framework http://blogs.egusd.net/mathgen/files/2015/09/Grade-6-13p8rai.pdf Connecting the fraction strips and number lines will also help students with the concepts in the next lesson.
2.6 G 6.NS.1	Estimate Quotients	Fractions strips	Compatible numbers	Use number lines to help students estimate quotients. (See About the Math on page 73A of Teacher's Manual)
2.7 Y 6.NS.1	Divide Fractions	Fraction strips Student White boards	Reciprocals, multiplicative inverses	Emphasis on number line modeling Teachers can model using an area model Focus on why the reciprocal works. Framework p.294: 1. Finding Common Denominators 2. Dividing Numerators and denominators (special case) 3. Dividing Numerators and denominators (leading to general case) 4. Dividing Numerators and denominators (general case) **Teach algorithm only after students have mastered the concept of reciprocal using area model**
2.8 Y 6.NS.1	Investigate: Model mixed Number Division	Pattern Blocks Fraction strips		Students should use hands-on materials (pattern blocks, fraction strips) to model division problems.
2.9 Y 6.NS.1	Divide Mixed Numbers	Fraction strips		Read pg.292-294 in the Framework prior to teaching the lesson. There is a lot of conceptual understanding needed to be successful with this lesson. Continue the work of Lesson 2.8 using manipulatives.

2.10 G 6.NS.1	Problem Solving: Fraction Operations	Fraction Strips		Use fraction strips to help students visualize the problem Encourage students to record the model they made with the fraction strips, to move from concrete to abstract models. Encourage the use of Standards of Mathematical Practice 4, when solving problems.
End of Chapter Assessment				
Reteach Options (1 day)	Reteach standards from this unit to help meet students' need. Some ideas for reteach activities are listed below: ● Math centers or math games focused on unit standards ● Small group instruction focused on a single standard ● Whole group instruction focused on a single standard ● My Favorite No – Rewrite student work with an error and work as a class to identify positives in the work and areas that need to be revised ● Select 1 – 3 problems to resolve in their groups and discuss whole class. We want new learning to occur on this day that helps students over misconceptions. ● Complete the "Performance Task" from Go Math! In the Assessment Book in small groups. Share strategies and discuss whole class. ● Use the Reteach activities based on standards that need intervention.			