Arithmetic Operations Including Dividing by a Fraction

In Module 2, students complete their understanding of the four operations as they study division of whole numbers, division by a fraction, and operations on multi-digit decimals. This expanded understanding serves to complete their study of the four operations with positive rational numbers.

Additional Resources

Virtual Manipulatives: http://www.glencoe.com/sites/common_assets/mathematics/ebook_assets/vmf/VMF-Interface.html

Fraction Tiles can be found on this site

https://www.khanacademy.org/

tutor.com http://military.tutor.com/

Math Terminology

- Algorithm
- Composite Number
- Distributive Property
- Dividend
- Divisor
- Estimate
- Factors
- Greatest Common Factor (GCF)
- Least Common Multiple (LCM)
- Multiples
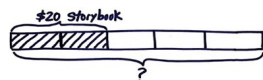- Multiplicative Inverse
- Prime Number
- Reciprocal

Big Ideas

- Dividing Fractions by Fractions
- Multi-Digit Decimal Operations – Adding, Subtracting, and Multiplying
- Dividing Whole Numbers and Decimals
- Number Theory – Thinking Logically About Multiplicative Arithmetic
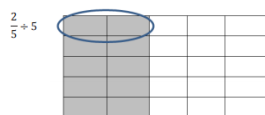
Tools & Representations

Fraction Tiles

Tape Diagrams

$20 Storybook
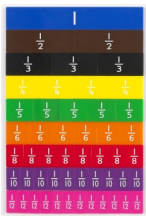
$20 ÷ 2 = $10
$10 × 5 = $50
David had $50 at first.

Area Models

$\frac{2}{5} \div 5$

Sample problems are on the back

College and Career Ready Standards

Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

- ■ Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.

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

- ○ Fluently divide multi-digit numbers using the standard algorithm.
- ○ Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
- ○ 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.
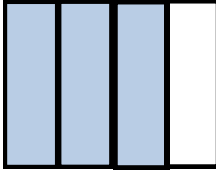
■ Major Standards | □ Supporting Standards | ○ Additional Standards

Sample Problem with an Area Model

¾ pan of lasagna is shared equally by 6 friends. What fraction of the pan will each friend get?

$$\frac{3}{4} \div 6 = \quad means \quad \frac{1}{6} \ of \ \frac{3}{4} = \frac{1}{6} x \frac{3}{4}$$

Begin by drawing a model of three-fourths:

Now divide the three-fourths model into 6 equal parts and shade one-sixths:

What is the intersection of the shading? $\frac{3}{24} = \frac{1}{8}$
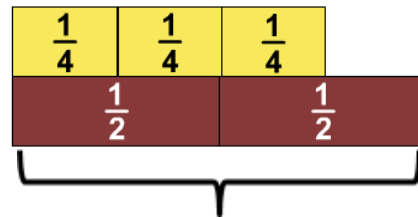
$$\frac{3}{4} \div 6 = \frac{1}{8}$$

Sample Problem with Fraction Tiles

How many ½ are in ¾ ?

Start by drawing ¾ tiles

Next draw as many ½ tiles below as possible

There are 1½ halves in ¾

$$\frac{3}{4} \div \frac{1}{2} = 1\frac{1}{2}$$

Virtual fraction tiles can be found at:

http://www.glencoe.com/sites/common_assets/mathematics ebook_assets/vmf/VMF-Interface.html

New Math Terminology and Examples

- **Greatest Common Factor** The greatest common factor of two whole numbers (not both zero) is the greatest whole number that is a factor of each number.
  - What is the GCF of 24 and 36?
  - *It is 12 because when all of the whole number factors of 24 and 36 are listed, the largest factor they share is 12.*
- **Least Common Multiple** The least common multiple of two whole numbers is the smallest whole number greater than zero that is a multiple of each number.
  - What is the LCM of 4 and 6?
  - *It is 12 because when the multiples of 4 and 6 are listed, the smallest or first multiple they share is 12.*
- **Multiplicative Inverses** A multiplicative inverse of a number is a number such that the product of both numbers is 1.
  - 3 /4 and 4 /3 are multiplicative inverses of one another because

$$\frac{3}{4} \ x \ \frac{4}{3} = 1$$

CCRSM Grade 6 Module 2