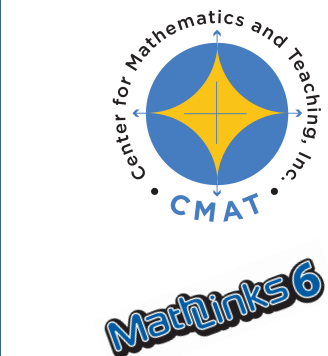# Packet 7: Fraction Multiplication and Division

Dear Parents/Guardians,

Packet 7 reviews important fraction concepts from grades 4 and 5. In Lesson 1, students will represent multiplication of fractions on a number line and as an area model to develop fraction multiplication procedures. In Lessons 2 and 3, students will explore the meaning of fraction division, building from the visual representation to the multiply-by-the-reciprocal rule.

Strategies for Multiplying Fractions

Strategy/Properties	Expression	Diagram	Number Sentence
Grouping Multiplication can be thought of as forming equal groups	$3 \times \dfrac{2}{5}$ "3 groups of $\frac{2}{5}$."		$\dfrac{2}{5} + \dfrac{2}{5} + \dfrac{2}{5}$ $= \dfrac{6}{5}$ or $1\dfrac{1}{5}$
Commutative Property The factors being multiplied can be reversed and still give the same product.	$\dfrac{1}{3} \times 2 = 2 \times \dfrac{1}{3}$ "One-third groups of two is the same as two groups of one-third."	*1 whole* *1 whole*	$\dfrac{1}{3} + \dfrac{1}{3}$ $= \dfrac{2}{3}$
Distributive Property The factors being multiplied is the same as multiplying one factor by the sum of the parts of the other factor.	$2 \times 1\dfrac{3}{7}$ $= 2\left(1 + \dfrac{3}{7}\right)$ "2 multiplied by $1\frac{3}{7}$ is the same as finding the sum of the product of $2(1)$ and $2\left(\frac{3}{7}\right)$."	Area model not drawn to scale.	$2\left(1 + \dfrac{3}{7}\right)$ $= 2(1) + 2\left(\dfrac{3}{7}\right)$ $= 2 + \dfrac{6}{7}$ $= 2\dfrac{6}{7}$
Multiply Across The product of two fractions can be found by multiplying across.	$\dfrac{1}{2} \times \dfrac{1}{2}$ "Take half of a half."	*1 whole* Half of the $\frac{1}{2}$ (yellow) would be $\frac{1}{4}$ of the whole.	$\dfrac{1}{2} \times \dfrac{1}{2}$ $= \dfrac{1 \times 1}{2 \times 2}$ $= \dfrac{1}{4}$

The Divide Across Strategy
Students will explore a divide-across strategy with diagrams and expressions.

Words	Diagram	Computation
How many groups of $\frac{1}{3}$ are in 2?		$2 \div \dfrac{1}{3}$ $\dfrac{6}{3} \div \dfrac{1}{3} = \dfrac{6 \div 1}{3 \div 3}$ $= 6$
How many groups of $\frac{2}{5}$ are in $\frac{7}{10}$?		$\dfrac{7}{10} \div \dfrac{2}{5}$ $\dfrac{7}{10} \div \dfrac{4}{10} = \dfrac{7 \div 4}{10 \div 10}$ $= \dfrac{7}{4}$ or $1\dfrac{3}{4}$