

## Packet 1: Whole Number Multiplication and Division

Dear Parents/Guardians,

Welcome to MathLinks! This math program consists of 16 cohesive consumable packets for students aligned with the 2010 Common Core State Standards. Each packet takes about two weeks to complete.

Packet 1 completes the work from grade 5 in multiplication and division of whole numbers. Students will use properties of arithmetic, visual models and mental math strategies to support multiplication and division.

Encourage your student to use the strategies below if they struggle with the traditional methods or to help them think more deeply about the concepts behind the traditional algorithms.

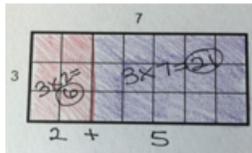
### Multiplication and the Properties of Arithmetic

Below are the properties of arithmetic students can use to simplify multiplication expressions.

Property	Friendly Definition	Example
Commutative Property	Changing the order of the factors does not change the product.	$7 \times 4 = 4 \times 7$ $28 = 28$
Associative Property	Changing the grouping of the factors does not change the product.	$25 \cdot (4 \cdot 9) = (25 \cdot 4) \cdot 9$ $25 \cdot 36 = 100 \cdot 9$ $900 = 900$
Distributive Property	Multiplying the outside factor over the two terms within the parenthesis first (rather than operating within the parenthesis first) does not change the value.	$4(20 + 7) = 4(20) + 4(7)$ $4(27) = 80 + 28$ $108 = 108$

### Multiplication Using an Area Model

Students can draw rectangles using the factors as the dimensions (length and width). Students can break apart the bigger numbers into two smaller ones so that it is easier to multiply.



$$\begin{aligned} 3(7) &= 3(2+5) \\ 3(7) &= 3(2)+3(5) \\ 3(7) &= 6+15 \\ 3(7) &= 21 \end{aligned}$$

$20$	$+$	$5$		$140$	$35$	$600$	$+ 150$	$1125$
$7$	$7(20) = 140$	$7(5) = 35$	$30$	$30(20) = 600$	$30(5) = 150$			
$37$	$37 \times 25 = (30 + 7) \times (20 + 5)$		$37 \times 25 = 1125$					

Add all of the partial products to find the total.

### Another Way to Divide

This method allows students to subtract out 'chunks' that they know rather than multiplying to get as close as possible to the dividend ("guess and check"). The number of groups that are subtracted out is the quotient (answer).

$16 \overline{) 432}$	$20$	$20 \times 16 = 320$
$\underline{- 320}$	$5$	$5 \times 16 = 80$
$\underline{- 80}$	$2$	$2 \times 16 = 32$
$\underline{- 32}$		
$\underline{0}$		

$20 + 5 + 2 = 27$



**By the end of the packet, your student should know...**

How to use the **properties of arithmetic** to make multiplication easier Lesson 1.1

How to represent multiplication using an **area model** Lesson 1.1

Different strategies for **division** Lesson 1.2

### Additional Resource

Resource Guide (RG)  
Part 1, pages 20-22  
(For additional strategies)