



Grade 3 Unit 3

Extending Multiplication and Division

Volume 1 Issue 3

References

Helpful Links:

A+ Math Flashcard Creator (create flashcards at home to practice your skills)

http://www.aplusmath.com/Flashcards/Flashcard_Creator.html

Math Baseball (kids can practice addition, subtraction, multiplication, and division as they play Math Baseball -- where every correct answer scores a homerun) <http://www.funbrain.com/math/index.html>

Two Minute Warning (race against the clock to see how many problems you can answer in two minutes) <http://www.primarygames.com/flashcards/multiplication/start.htm>

Dear Parents

Welcome to the new school year! We are eager to work with you and your students as we learn new mathematical concepts. Your student's math class is calling for students to be actively engaged in doing math in order to learn math. In the classroom, students will frequently work on tasks and activities to discover and apply mathematical thinking. Students will be expected to explain or justify their answers and to write clearly and properly. Your students will receive a consumable textbook and online access from their teacher.

Concepts Students will Use and Understand

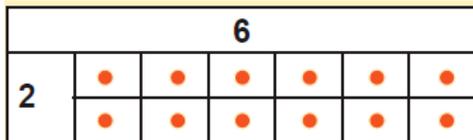
- Use mental math to multiply and divide
- Demonstrate fluency with the multiplication facts up to 10 x10
- Use estimation to determine reasonableness of products and quotients
- Read, interpret, solve, and compose simple word problems dealing with multiplication and division.
- Use inverses to verify accuracy of computation
- Write and solve expressions using symbols in place of numbers
- Apply patterns and rules to describe relationships and solve patterns

Vocabulary

Factors: two or more whole numbers multiplied together to get a given number called the product

Product: the result of multiplication

Array: the arrangement of objects in equal rows. Example:



Quotient: the result of division

Dividend: number being divided; total amount being dividing into groups. Ex. $24 \div 8 = 3$; 24 is the dividend, 8 is the divisor, and 3 is the quotient.

Divisor: number dividing into the total; may be the number of groups or the number of items in a specific number of groups.

Commutative Properties: numbers may be added or multiplied together in any order.

Associative Properties: no matter how the numbers are grouped, the answers will always be the same.

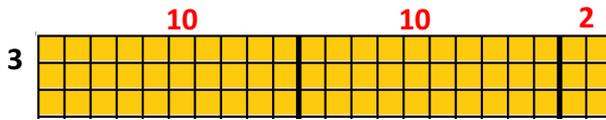
Distributive Properties: The sum of two addends multiplied by a number is the sum of the product of each addend and the number

Try <http://intermath.coe.uga.edu/dictionary/homepg.asp> or <http://www.amathsdictionaryforkids.com/> for further examples

Example Strategies of Multiplication

Example 1

Students move to building larger arrays (also called the *area model of multiplication*).



A student has shaded an array, 22×3 , on grid paper.

Georgia Math Grade 3 Textbook

Connection:

Ch. 1, Lessons 1-6

Ch. 2, Lessons 1,4,5,6,9

Ch. 3, Lessons 1-4

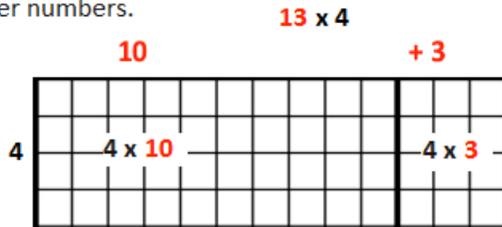
Textbook Online:

connected.mcgraw-hill.com

Ask your teacher for the online passcode.

Example 2

Third graders progress to diagrams that explain the *area model of multiplication* with larger numbers.



Example 3

Familiarity with the area model above allows students to move to working with partial products.

$$\begin{aligned} & 4 \times 13 \\ & 4 \times (10 + 3) \\ & (4 \times 10) + (4 \times 3) \\ & 40 + 12 = 52 \end{aligned}$$

symbols

+ addition

- subtraction

\times or \bullet multiplication

\div division

Example Strategies for Division

Example 1

This third grader has used the multiply up strategy. This involves finding the solution to a division problem through multiplication.

$$\begin{aligned} & 45 \div 3 \\ & 3 \times 10 = 30 \\ & 3 \times 5 = 15 \\ & 30 + 15 = 45 \\ & 10 + 5 = 15 \text{ so, } 3 \times 15 = 45 \end{aligned}$$

Example 2

Another strategy a third grader may use is the *partial quotient* strategy.

$$\begin{array}{r|l} 3 \overline{) 45} & \\ - 30 & 10 \\ \hline 15 & \\ - 15 & 5 \\ \hline 0 & =15 \\ \hline \end{array}$$

$45 \div 3 = 15$

Home Activities:

Here are some story problems and activities that students could see in the classroom.

1. Tyler and Hailey are playing a game called "Chance". They get three points every time they draw a blue card and five points every time they draw a red card. Whoever gets 75 points first wins the game. Tyler has 41 points now and he has 9 cards. How many cards does he have of each color? Explain your thinking using words, numbers or pictures.

Possible solutions:

I thought of multiples of 3 and multiples of 5 and added them together to try to get 41.

3: 3, 6, 9, 12, 15, 18, 21

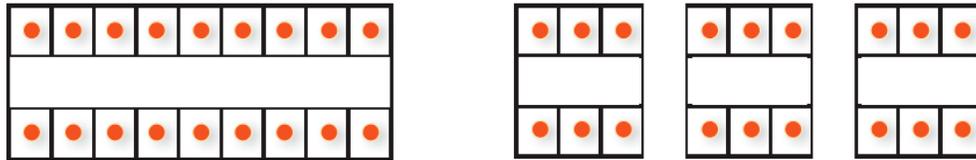
5: 5, 10, 15, 20, 25, 30, 35, 40, 45

Tyler could have two blue cards and seven red cards because $2 \times 3 = 6$, $7 \times 5 = 35$, and $6 + 35 = 41$ points, and $2 + 7 = 9$ cards.

2. There are 24 slices of pizza. How many slices would each person get if there were: Three people? Four people? Six people? Eight people? Twelve people?

Three people would each get 8 slices; four people would each get 6 slices; six people would each get 4 slices; eight people would each get 3 slices; twelve people would each get 2 slices.

3. There are 18 people coming for dinner. How can we set up tables to seat everyone? No one will sit at the head or the foot of the tables. Draw rectangles to represent the tables and mark to show where someone will sit.



4. Find the missing number in the function

Input	Output
7	49
3	21
10	70
5	?
?	56

I noticed that $7 \times 7 = 49$ and $7 \times 3 = 21$ and $7 \times 10 = 70$. So I decided that $7 \times \text{input} = \text{output}$. Then I multiplied 7×5 to get 35 and worked backwards to get 8 by dividing: $56 \div 7$.

5. Look for patterns in nature and environment, such as, "If one chair has 4 legs, how many legs do 5 similar chairs have?"