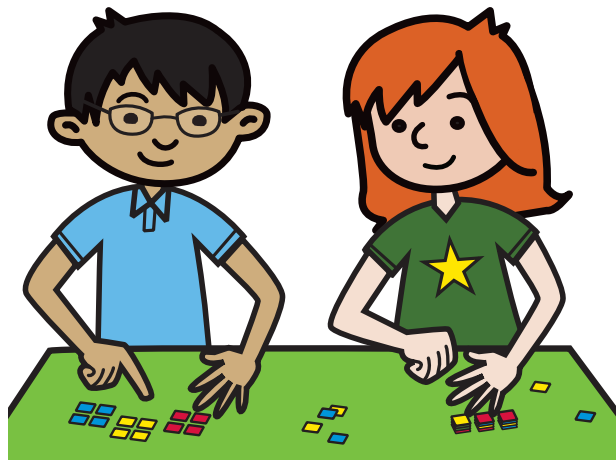**Bridges in Mathematics
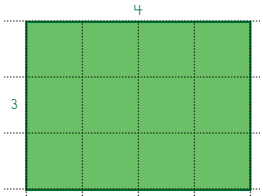Grade 3 Unit 5**

Multiplication, Division & Area

In this unit, your student will:

- Solve multiplication and division problems

- Investigate two different interpretations of division

- Calculate the area of rectangles

Your student will practice these skills by solving problems such as these:

PROBLEM	COMMENTS
Mateo sells chew toys for dogs. There are 3 toys in each package. How many packages of chew toys did Mateo sell if he sold a total of 24 chew toys? 8 ← Number of packages ↗3 Number of chew toys in each package 12 12 Array Model	Students pose and solve division problems involving items in a pet store. Students may arrange items using an array model or a grouping model. They can then use the relationship between multiplication and division to solve a problem like the following. Grouping Model
DeAndre and his 5 friends have 24 character cards that they want to share equally. How many character cards would each of the 6 children get? $24 \div 6 = 4$	Students write multiplication and division equations to represent a problem situation. They then solve the problem using a model of their choice, such as a picture or an array. $24 \div 6 = c$ $6 \times c = 24$
Ms. Rowan has 6 tables in her classroom and 24 students. If she divides the students equally among the tables, how many students will sit at each table? **What are we trying to find?** ___ The number of groups? **X** The number in each group?	As students solve problem situations involving division, they learn that there are two different interpretations of division. To solve a problem, students first determine what information is known and what information they are trying to find. In this problem, students determine that they are trying to find the number of students at each table (the number in each group) before using a model to solve the problem.

PROBLEM	COMMENTS
Label the dimensions and the area of one of the rectangles you worked with today. The area of my rectangle is 12 square units.	Students explore the concept of area by covering four paper rectangles with square tiles. Students use the colored tile blocks and grid paper to help them determine the area of a rectangle. In the process, they are transitioning from counting the number of square units that cover a rectangle to representing the area with a multiplication equation. $3 \times 4 = 12$

For additional support, you can use the Math Vocabulary Cards app at apps.mathlearningcenter.org.

Frequently Asked Questions About Unit 5

Q: Why does my student say, for example, "doubles facts" instead of "multiply by 2"?

A: We expect students to recall basic multiplication facts from memory by the end of third grade. To help students reach this level of proficiency, they may use strategies to compute the answers. We have categorized the multiplication facts in two categories:
- *Foundational facts* are facts that students tend to know well. They can use them to find other facts.
- *Derived fact strategies* are built on foundational facts. Students draw upon facts they already know and use computational strategies to calculate facts they may not yet know. One advantage of learning derived fact strategies is that students will later use them for multidigit multiplication.

FOUNDATIONAL FACT SETS
0s Zero Property of Multiplication
$7 \times 0 = 0$ and $0 \times 7 = 0$
1s Identity Property of Multiplication
$4 \times 1 = 4$ and $1 \times 4 = 4$
2s Doubles
$9 \times 2 = 18$ and $2 \times 9 = 18$
10s & 5s Half 10s
$6 \times 10 = 60$ and $10 \times 6 = 60$ $6 \times 5 = 30$ and $5 \times 6 = 30$ (Half of 6×10 or 10×6)

DERIVED FACT STRATEGIES	
Doubling Associative Property of Multiplication	
4×6 "I know that $2 \times 6 = 12$, so 4×6 is double that: 24." $4 \times 6 = (2 \times 2) \times 6 = 2 \times (2 \times 6) = 2 \times 12 = 24$	8×6 "If I know that $4 \times 6 = 24$, then I can double that product. Since four 6s is 24, eight is $24 + 24$, or 48." $8 \times 6 = (2 \times 4) \times 6 = 2 \times (4 \times 6) = 2 \times 24 = 48$
Adding a Group Distributive Property of Multiplication over Addition	
3×6 "I know that $2 \times 6 = 12$. I can add one more group of 6 to 12 to get 18. So 3×6 is 18." $3 \times 6 = (2 + 1) \times 6 = (2 \times 6) + (1 \times 6) = 12 + 6 = 18$	6×3 "Since five 3s is 15, I can add another 3 to get 18." $6 \times 3 = (5 + 1) \times 3 = (5 \times 3) + = (1 \times 3) = 15 + 3 = 18$
Subtracting a Group Distributive Property of Multiplication over Addition	
$9 \times 3 = 27$ "Ten 3s is equal to 30. If I take away a group of 3 to get 27, then that's the same as 9 groups of 3." $9 \times 3 = (10 - 1) \times 3 = (10 \times 3) - (1 \times 3) = 30 - 3 = 27$	
Breaking Apart Distributive Property of Multiplication over Addition	
$7 \times 6 = 42$ "Seven 6s is the same as five 6s and two 6s. Five 6s is 30 and two more is 12, so $7 \times 6 = 42$." $7 \times 6 = (5 + 2) \times 6 = (5 \times 6) + (2 \times 6) = 30 + 12 = 42$	

Q: How can I support my student's learning?

A: Visit mathathome.mathlearningcenter.org and work through some or all of the activities in Grade 3: Set 5 together. These activities complement the learning that takes place in the classroom during Unit 5 and provide fun ways to engage children in mathematical thinking. This set also includes digital versions of games that your student has learned at school, such as Division Capture.