ORIGO Summer School

Grade 3
Sample Lesson

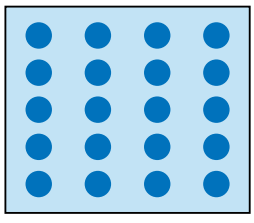
Topic 5

Relating multiplication and division

This week your student will explore the mathematical links between multiplication and division. Your student will build on their prior knowledge of multiplication facts to learn division facts. This helps them develop an understanding of division from a place of *knowing* rather than starting with a blank slate. Your student will first work with the tens, fives and twos division facts as these are the multiplication facts they are generally more confident with. Your student will also learn the division symbol as their language development progresses.

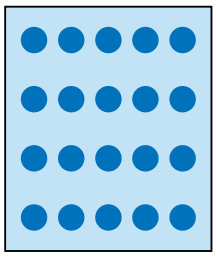
There are two models commonly used to link division and multiplication: array and equal groups.

The *array* model is a pictorial representation of a multiplication and division fact. It shows equal rows of dots.



5 rows of 4 dots = 20
5 × 4 = 20

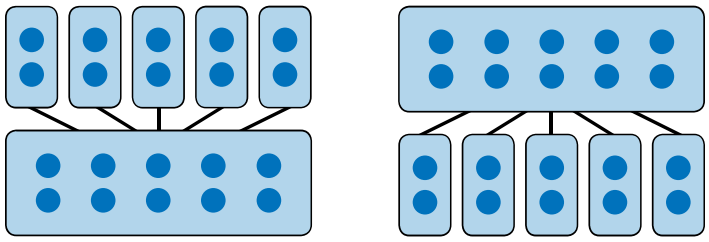
20 dots shared equally
into 5 rows = 4
20 ÷ 5 = 4



4 rows of 5 dots = 20
4 × 5 = 20

20 dots shared equally
into 4 rows = 5
20 ÷ 4 = 5

The *equal groups* model shows how groups of the same number added together is the same value as a multiplication fact and the same representation turned around shows the total being shared equally which is the same value as a division fact.



5 groups of 2 = 10
5 × 2 = 10

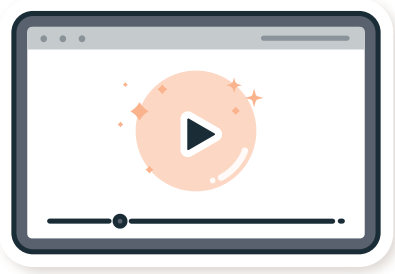
10 ÷ 5 = 2

Encourage your student to use objects, such as small toys or counters, as they practice using these models and develop their understanding of the links between multiplication and division.

Before you begin, watch this **ORIGO ONE** video about teaching the think-multiplication strategy for division.

And if there is time, watch the **Gem Stones Video** about relating multiplication and division to learn more about this model.

Monday — Watch and Talk



Watch the **Gem Stones** video with your student to learn more about the relationship between multiplication and division.

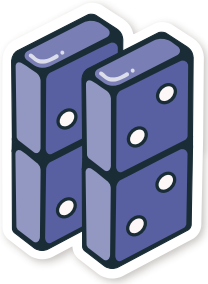
Talk with your student about the structure of each operation. Highlight that for multiplication the number of groups and the number in each group is known, but the total is unknown. Whereas, for division the total is known, but the number of groups or the number in each group is unknown.

Create some everyday situations that involve multiplication or division and have your student identify the operation to match. For example, your student has six blocks and they need to equally share the blocks with their sibling. Ask your student if they will use multiplication or division to work out the problem, and how many blocks will each sibling get.

Have your student **complete** the Student Journal pages, **color version** or **B&W version** , to learn about the division symbol. If necessary, work through the Step In with your student so they are familiar with the symbol before completing each question.

Access the **answers** to check your student's work.

Tuesday — Hands-on Math



Before you begin, **gather** five plates (preferably paper or other non-breakable material) to use in today's activity.

Have your student **collect** 15 of the same object, either from inside or outside in the backyard (for example, small toys, pencils, leaves, sticks or flowers). Show your student the five plates and ask them to share their objects equally between the plates. Ask your student how many objects are in each group. Explain that sharing into equal groups is related to division. 15 shared into 5 groups is 3 in each group.

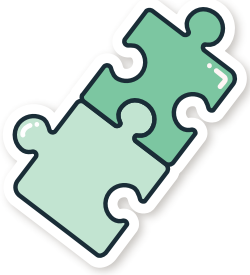
Have your student remove the objects from the five plates and gather them into one large group. Ask, How many objects are there in total? Reinforce that adding multiple groups of the same number is related to multiplication. 5 groups of 3 is equal to 15 in total.

Repeat the activity using 20 objects.

Have your student **complete** the Student Journal pages, color version or B&W version , to help reinforce the relationship between multiplication and division.

Access the answers to check your student's work.

Wednesday — Problem-solving



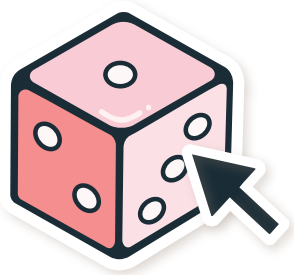
Read the word problems below with your student. Ensure they understand what the problem is about. A helpful way to do this is to have them say the word problem in their own words. Encourage your student to draw pictures to help their thinking.

Each Saturday, a farmer shares a bag of apples equally among his four horses. There are twelve apples in the bag. How many apples do they each eat? (Answer: Each horse eats 3 apples.)

Last Saturday, one of the horses did not eat any apples, so the farmer shared all the apples with the other horses. How many apples did each horse eat? (Answer: Each horse eats 4 apples.)

Afterwards, talk about the strategies your student used to solve the problem and discuss the pictures they drew. Encourage your student to think about other ways they could solve the problem.

Thursday — Game Day

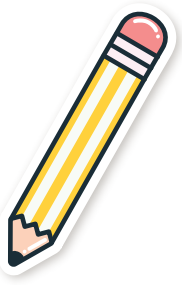


Play the game **Make a Choice** with your student. This game helps students think about which numbers can be divided by 5.

Start the game by clicking the cards to turn one over. You then decide to either multiply the number on the card by 5 or divide the number by 5. Students can use counters or blocks to help their thinking. Click and drag a counter to the number you calculated on the game board. If there is already a counter on the number, you miss a turn. The first player with four counters in a row wins.

Click the ? to learn more about the game rules. Click the to restart the game.

Friday — Practice



Show the **Sharing Mat** tool to your student. Ask them to describe the number of groups (5) and the number of counters in each group (4). Click and drag all the counters to the large section of the mat and confirm that there are 20 counters in total. Ask your student to write a multiplication equation to match ($5 \times 4 = 20$).

Reinforce the link between multiplication and division by having your student share the 20 counters equally back into the 5 groups. When they have completed the sharing, ask them to say the number of counters in each group and write a division equation to match ($20 \div 5 = 4$).

Repeat with 5 groups of 3 counters.

Have student complete the practice page, **color version** or **B&W version**.

Access the **answers** to check your student's work.