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Model Division as an Unknown Factor

Unit 1 Lesson 7a

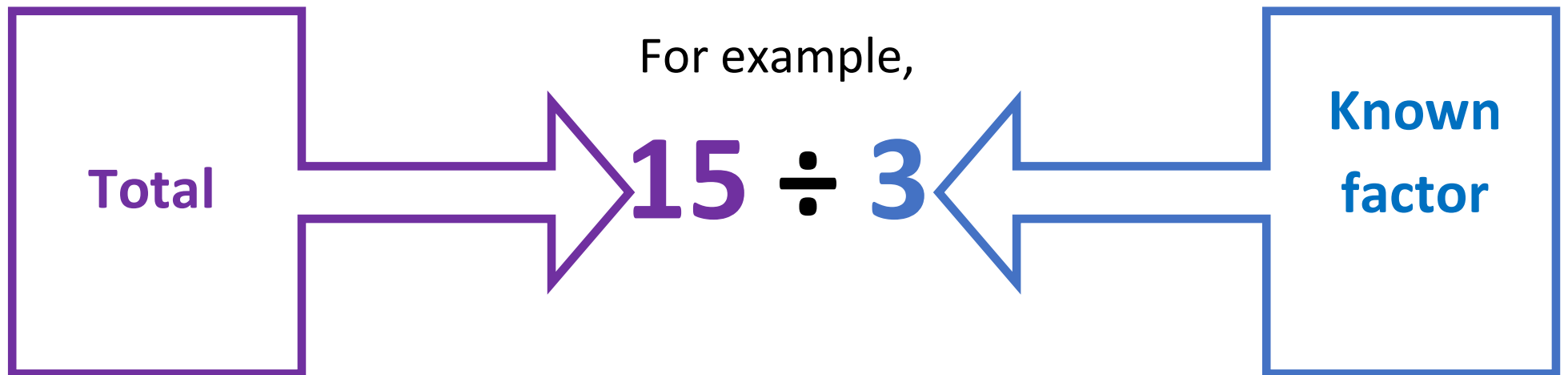
What is an unknown factor?

Factors are numbers multiplied by each other in order to get a product. Multiplication deals with factor pairs to get a product. On the other hand, division works to **find a missing factor that would be the one multiplied by the known factor in order to get the total or the product.** Division seeks to find the factors of a bigger number.

That means that **the known factor will always have the same factor to be pairs with in relation to the total.** The unknown factor is called the quotient.

We can read a division equation $A \div B = C$ as what could be the **value of C multiplied to B in order to get A.** A is called the dividend, B is called the divisor and C is called the quotient.

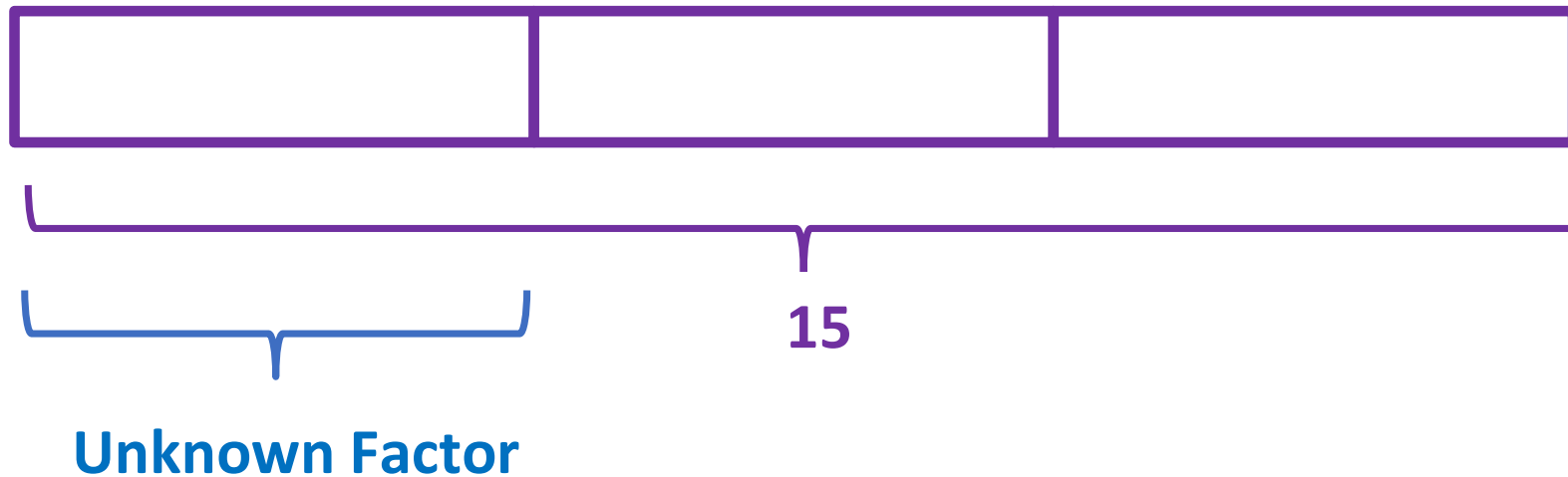
What is an array?



What is an unknown factor?

$$15 \div 3$$

What do you multiply to 3 to get 15?

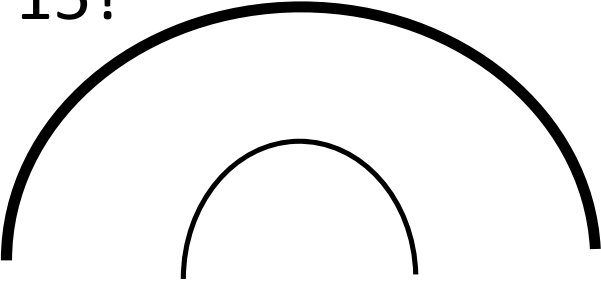


What is an unknown factor?

$$15 \div 3$$

What are the factors of 15?

1, 3, 5, 15



The diagram shows the factors of 15: 1, 3, 5, and 15. A large black arc connects the number 1 on the left to the number 15 on the right. A smaller black arc connects the number 3 to the number 5.

What is an unknown factor?

$$15 \div 3$$

$$3 \times 1 = 3$$

$$3 \times 5 = 15$$

$$3 \times 15 = 45$$

We can see that 3×5 is the factor pair that produces 15.
So, **5** is the unknown factor.

List down all the factors of 12

1, 2, 3, 4, 6, 12

What do you multiply to 2 to get 12?

6

What do you multiply to 3 to get 12?

4

6 and 4 are the unknown factors

List down all the factors of 18

1, 2, 3, 6, 9, 18

What do you multiply to 2 to get 18?

9

What do you multiply to 3 to get 18?

6

9 and 6 are the unknown factors

¿? Time to Think ¿?

**1. If the known factor is 3 and the total is 21, what is the unknown factor?
How would you write its number sentence?**

➤ The factor pair that produces 21 is 3 and 7. So, 7 is the unknown factor. The number sentence is $21 \div 3 = 7$.

2. How are unknown factors related to factor pairs?

➤ Unknown factors are related to factor pairs by easily knowing what factor is missing. If you know the factor and the product, you will easily find out the unknown, which is the factor you multiply to the known to get the total.



$$4 \times 2$$

$$\underline{8} \div 2 = 4$$



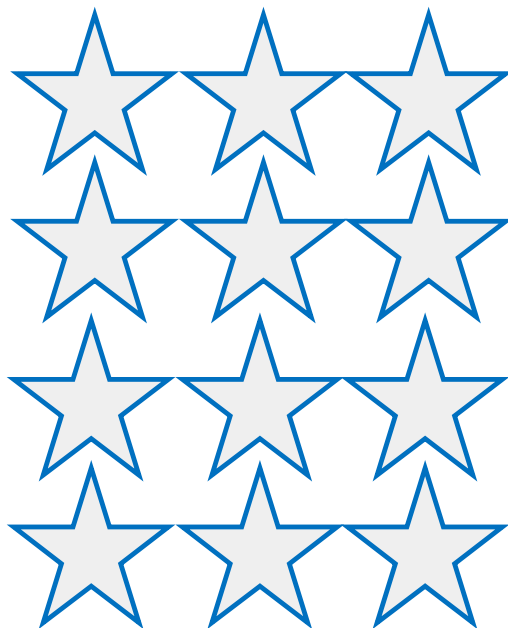
$$3 \times 6$$

$$\underline{18} \div 3 = 6$$



$$2 \times 8$$

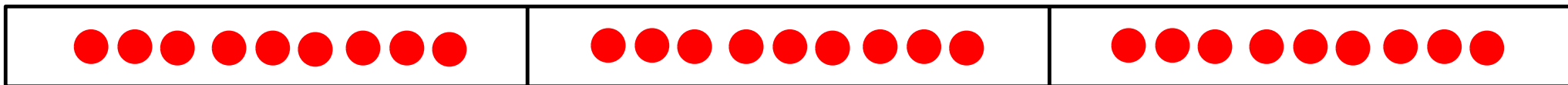
$$\underline{16} \div 2 = 8$$



$$4 \times 3$$

$$\underline{12} \div 3 = 4$$

$$27 \div 3 = \underline{9}$$



$$8 \div 2 = 4$$



¿? Time to Think ¿?

How do you know the missing factor in a tape diagram?



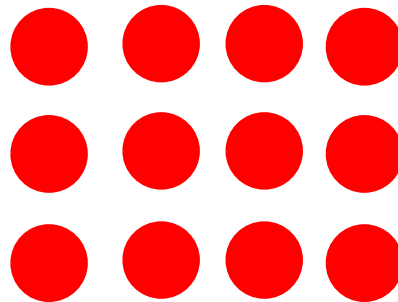
First of all, the known factor in a tape diagram is the number of partitions in the rectangle. To know the missing factor, we can put one object in each partition until our total is all used up.

The tape diagram has a total of 16 dots inside and is cut into 2.

What is the unknown factor?

3

Draw an array to represent it

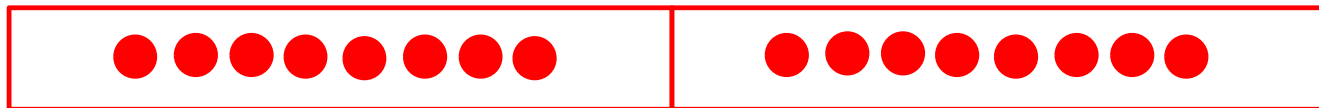


The tape diagram has a total of 16 dots inside and is cut into 2.

What is the unknown factor?

8

Draw a tape diagram to represent it

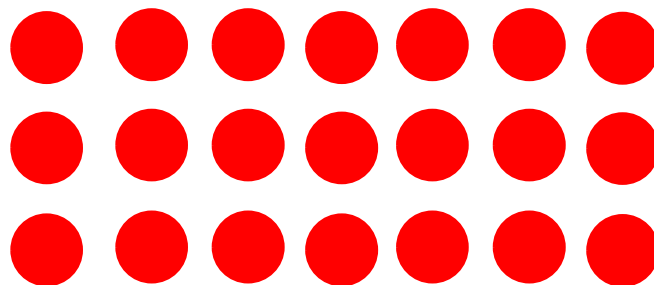


There are 7 dots in each row. The total number of dots is 21.

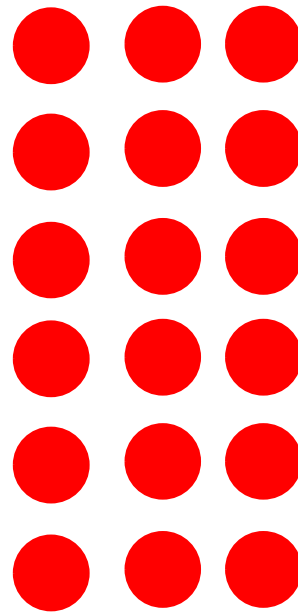
What is the unknown factor?

3

Draw an array to represent it



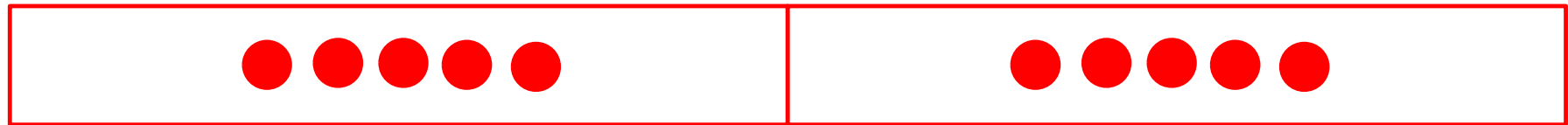
Grace stacks 3 cups into a number of rows. She has 18 cups. How many rows are they stacked into? Draw an array.



The known factor is 3. We multiply
6 to 3 to get 18.

So, $18 \div 3 = 6$ rows

Martha has 2 folders. She wants to divide 10 files equally in each folder. How many files are in each folder? Draw a tape diagram.



The known factor is 2. We multiply
5 to 2 to get 10.

So, $10 \div 2 = 5$ files