

What is a factor?

Factors are numbers multiplied by each other in order to get a product. In the equal groups strategy, these numbers tell us **the size of a group** and **the number of groups there are** in a multiplication situation. Likewise, in an array model, these numbers tell us **how many rows and columns** there are in an array.

That means that **factors are the multiplicand and the multiplier in a multiplication equation.**

We can read a multiplication equation $A \times B = C$ as **A being the multiplicand, B being the multiplier, and C being the product.** **A and B are called the factors of C.**

For example, $3 \times 4 = 12$.

3 can be identified as the multiplicand.

4 can be identified as the multiplier.

12 can be identified as the product.

However, 3 and 4 are not the only factors of 12.

The Meaning of Factors

Guided Notes

Math 3

To find all factors of 12, we can simply identify what pairs of numbers have a product of 12.

Start with **1**. What do you multiply with **1** to get 12?

1 x **12** = 12. Therefore, our first pair is **1** and **12**

Next is **2**. What do you multiply with **2** to get 12?

2 x **6** = 12. Therefore, our second pair is **2** and **6**

Next is **3**. What do you multiply with **3** to get 12?

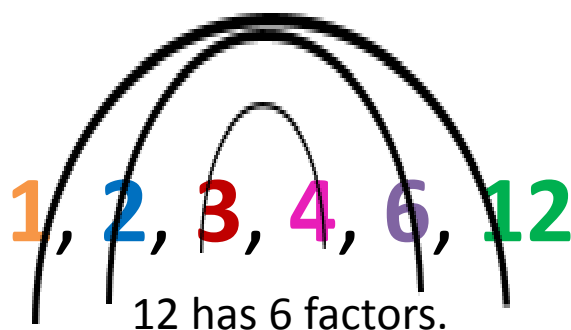
3 x **4** = 12. Therefore, our third pair is **3** and **4**

You will know when to stop once you encounter a repeat of pairs like:

Next is **4**. What do you multiply with **4** to get 12?

4 x **3** = 12. Therefore, our third pair repeated which is **4** and **3**

Once you got all the factors, list them all together.

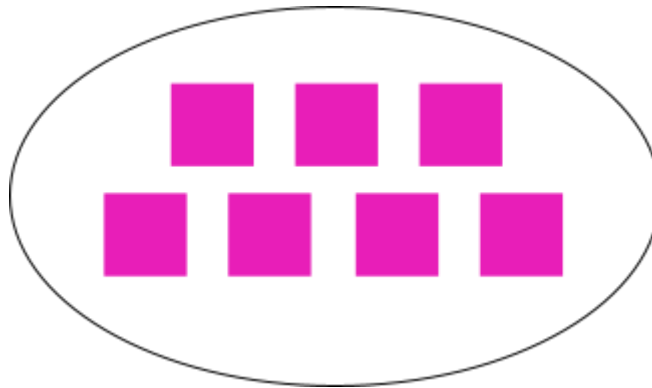


The Meaning of Factors

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There is 1 group of 7 squares.



$$1 \times 7 = 7$$

The array is made up of 5 rows and 1 column.



$$5 \times 1 = 5$$

Time to think

1. What do you notice about the number 1?

1 is always the first factor of any number.

2. Can the product itself be considered as its own factor? How?

Yes. It is its own factor because it is paired with 1.

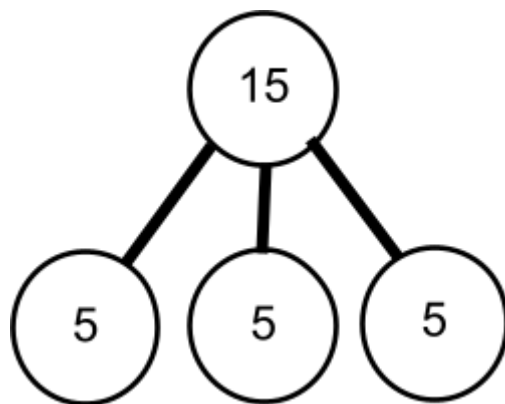
The Meaning of Factors

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The following models are called number bonds.

Number bonds are models that illustrate a part-part-whole relationship of numbers.

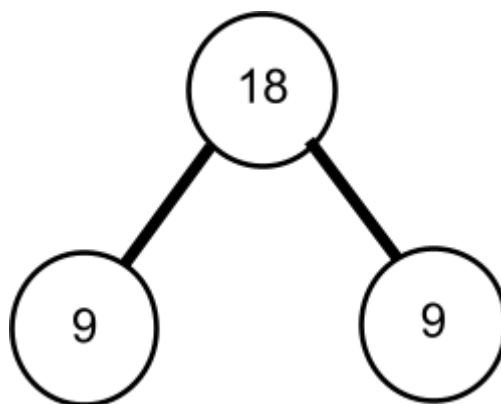


There are 3 groups of 5.

15 is called the **product**

3 and 5 are the factors.

$$3 \times 5 = 15$$

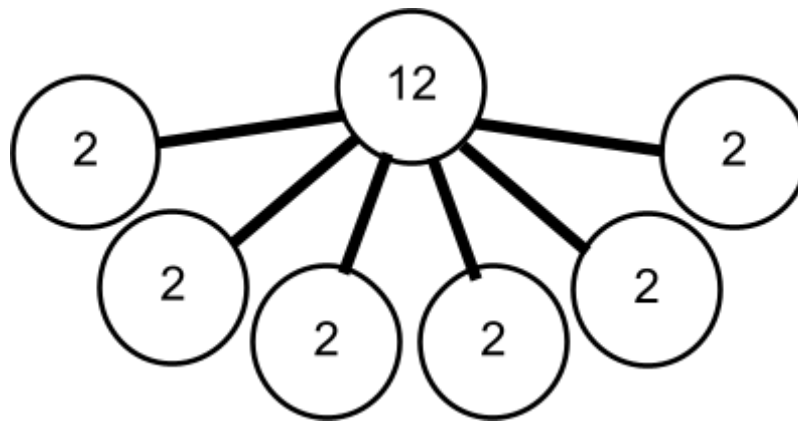


There are 2 groups of 9.

18 is called the **product**

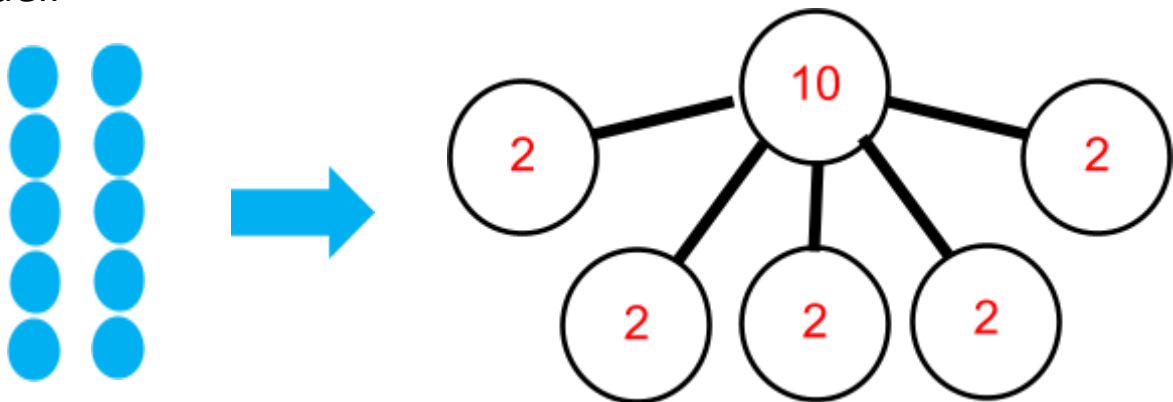
2 and 9 are the factors.

$$2 \times 9 = 18$$

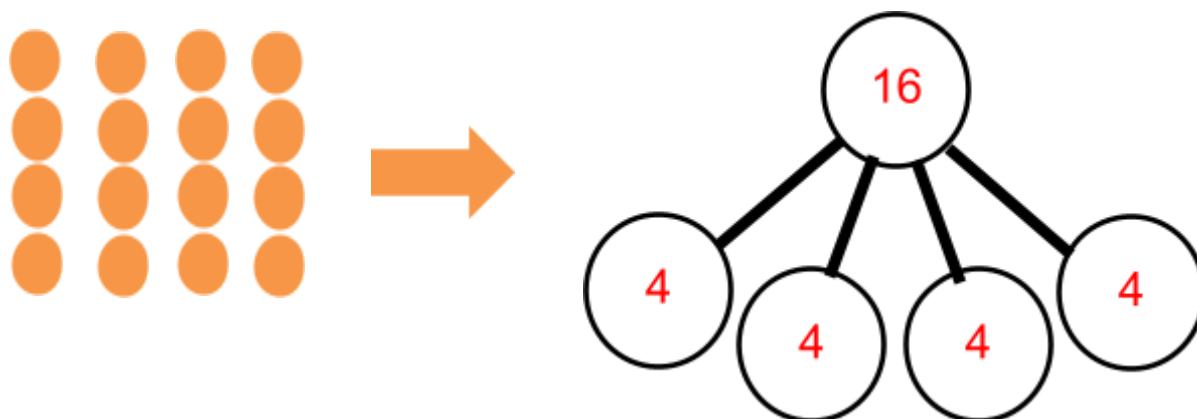
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There are 6 groups of 2.
12 is called the **product**
6 and 2 are the factors.
 $6 \times 2 = 12$

We can also use number bonds to represent factors of an array model.



There are 5 rows of 2
10 is the product.
5 and 2 are the factors.
 $5 \times 2 = 10$

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There are 4 rows of 4

16 is the product.

4 and 4 are the factors.

$$4 \times 4 = 16$$

Time to think

1. What do you notice about the relationship between an array model and the equal groups strategy?

The number of rows is the same as the number of groups that determine a multiplication equation.

2. How is a number bond related to the equal groups strategy?

A number bond also shows groups of numbers. Each group has the same value inside.

The Meaning of Factors

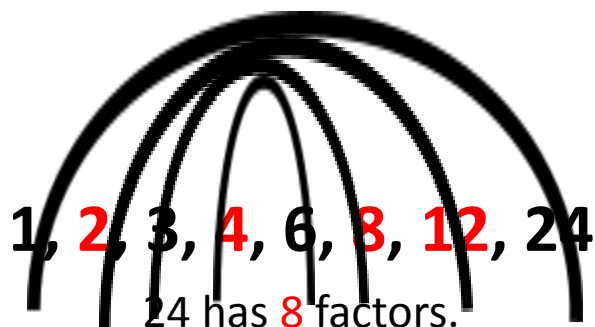
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Math 3

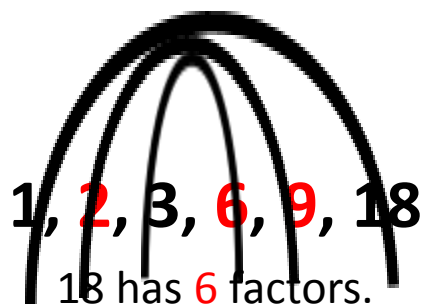
List the factors of 8. Draw an arc for each factor pair.



List the factors of 24. Draw an arc for each factor pair.



List the factors of 18. Draw an arc for each factor pair.



The Meaning of Factors

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Time to think

Using the lesson learned about factors. List the factors of the following:

25

1, 5, 25

32

1, 2, 4, 8, 16, 32

28

1, 2, 4, 7, 14, 28