Multiplication Using Array Model   Guided Notes   **Math 3**

What is an array?

Using an array model is one way to multiply factors visually. Factors are what we call to the numbers that we multiply. Multiplying using an array model means drawing a particular number of same-sized objects into **rows and columns**. An array model is an image where you can count horizontal rows and vertical columns. The factors are the numbers that determine **how many rows of particular columns there will be**.

That means that **each row always has the same amount of items in it**. The total number of items in an array model is what we call the product, which is the answer to a multiplication problem.

We can read a multiplication equation **A x B** as **A rows having B columns**.

For example, **3 x 6** can be read as having **3 rows of 6 columns**. With this, we will draw 6 same-sized shapes into one horizontal straight line. Then, we repeat it until we have 3 rows.
Count how many items there are in the array to determine the product.
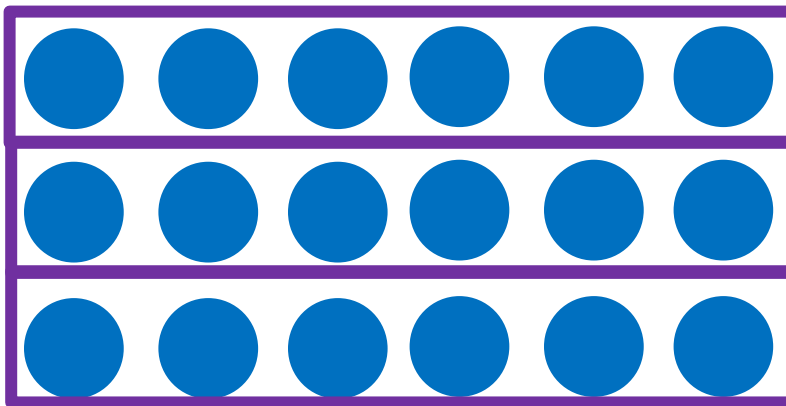
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For example:

<h1 style="text-align:center">3 x 6</h1>

<p style="text-align:center">**Number of rows** **Number of columns**</p>

<p style="text-align:center">**3 rows of 6**</p>

First, draw 6 same-sized shapes in one horizontal line:
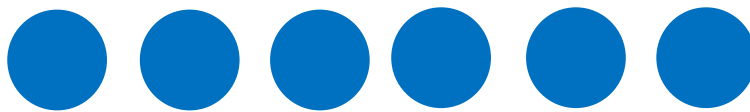
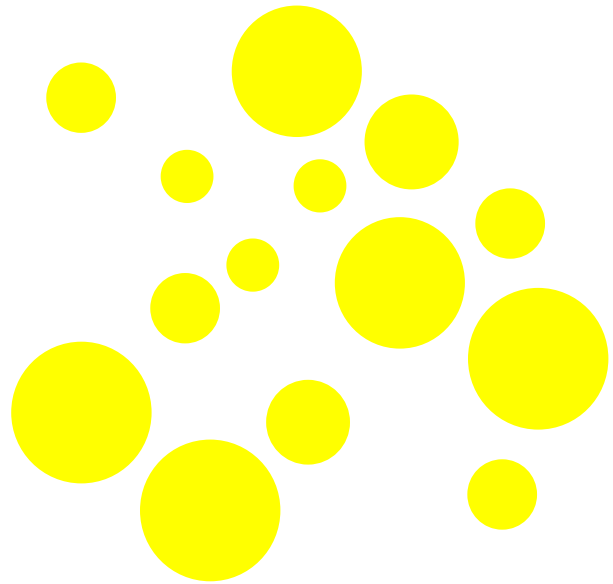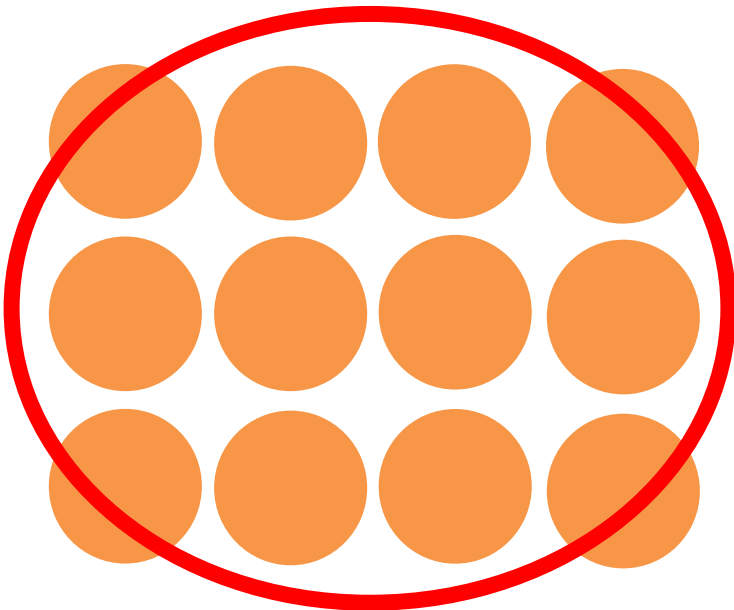Then, draw horizontal line with the same amount of circles until you reach the desired number of rows:

Count all the dots created in the 3 by 6 array model:

There are **18** dots in the array model.

So, the product is **18**.

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Encircle the model that shows an array

How many rows and how many columns does the array have?

3 rows of 4 columns

Time to think

1. How does an array model look like? How does it help in multiplication?

An array model has objects aligned in rows and columns. This helps in multiplication in visually grouping getting a product by the organized structure of rows and columns.

2. Why can't scattered items be classified as arrays?

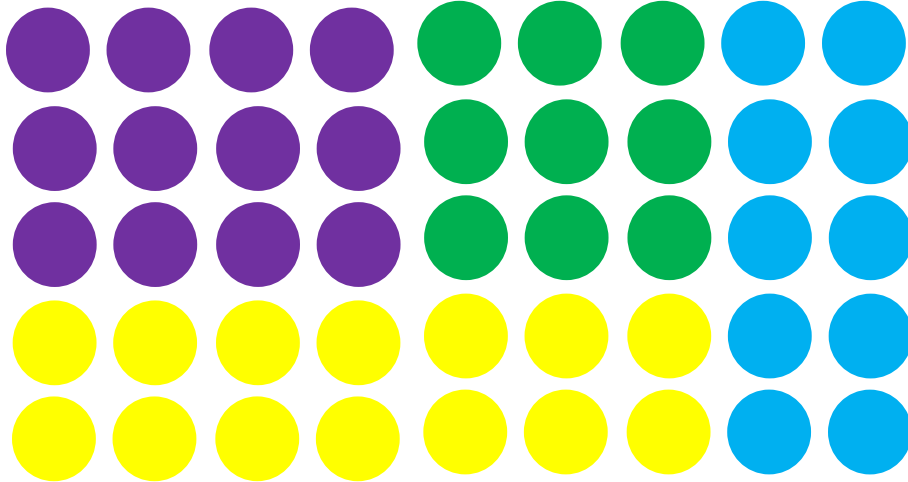Scattered items are not aligned into rows and columns.

3. Is a table an array?

Yes because it has rows and columns.

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An array can actually be composed of more than one array.

See the array below:

The purple array is composed of 3 rows and 4 columns.

Its expression can be written as 3 x 4

The yellow array is composed of 2 rows and 7 columns.

The expression can be written as 2 x 7

The green array is composed of 3 rows and 3 columns.

The expression can be written as 3 x 3

The blue array is composed of 5 rows and 2 columns.

Its expression can be written as 5 x 2

The whole array is composed of 5 rows and 9 columns.

Its expression can be written as 5 x 9

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Time to Think

1. What is the sum of the products of the purple, yellow, blue, and green arrays?

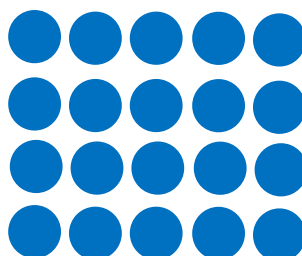Purple: 12, Yellow: 14, Blue: 10, Green: 9

12 + 14 + 10 + 9 = 45

2. How is this related to the product of the entire array?

The sum of all the products of the small arrays is the same as the product of 5 x 9 = 45. This means that an array can be solved into smaller arrays to get the whole product.
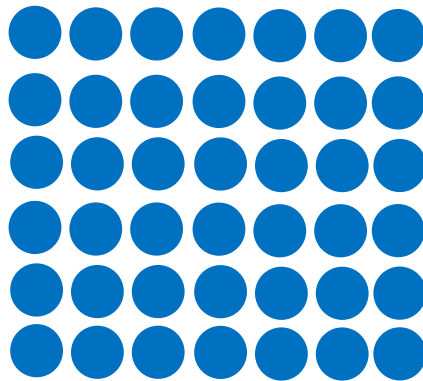
Draw an array for the expression 4 x 5

There are 4 rows and 5 columns.
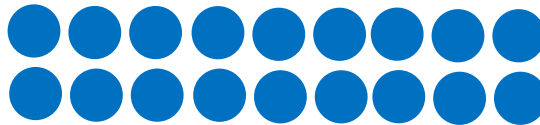
The product is 20.

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Draw an array for the expression 6 x 7

There are 6 rows and 7 columns.
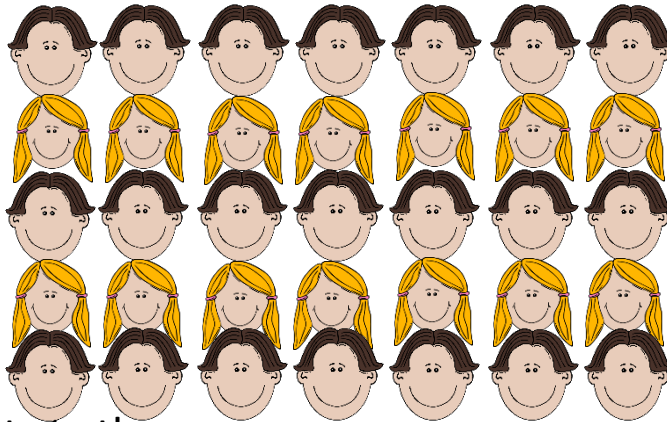
The product is 42.

Draw an array for the expression 2 x 9

There are 2 rows and 9 columns.

The product is 18.

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Students aligned themselves into 5 horizontal lines and 7 vertical lines. How many students are in the array?
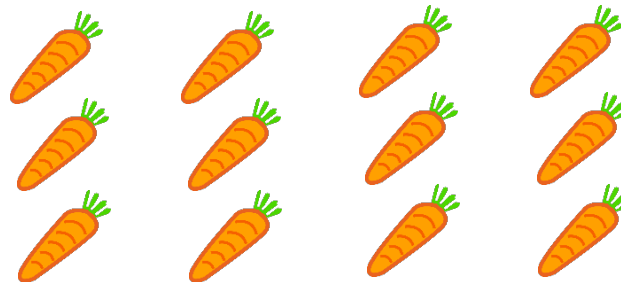
Draw <u>5</u> rows of <u>7</u> students.

There are <u>35</u> students in the array.

Johann has 3 rows of 4 carrots in his container. How many carrots are there altogether?
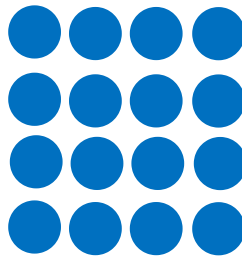
Draw <u>3</u> rows of <u>4</u> carrots.

There are <u>12</u> carrots.

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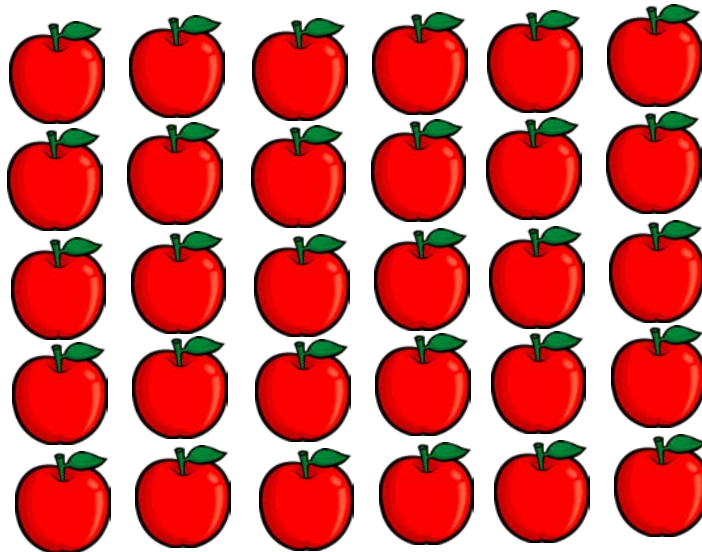
Time to Think

Using what we learned about the array models, answer these word problems:

1.   Ryan saw 4 spots aligned into 4 columns. How many spots are there?

4 rows of 4 mean 4 x 4. The product is **16 spots**.

2.   Patricia wants to put 6 apples each in 5 rows. How many apples does she have?

5 rows of 6 mean 5 x 6. The product is **30 apples**

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