

# Rows, Rectangles and Multiplication

# Picture Puzzles

Creator ... Doug. Williams

Publisher ... Mathematics Centre ... [mathematicscentre.com](http://mathematicscentre.com)

© Doug. Williams

## LIMITED REPRODUCTION RIGHTS

The publisher grants permission to the school, institution or teacher who purchases this Picture Puzzle to reproduce it for the exclusive use of their students. The file must not be altered in any way, unless specific permission is granted in writing. Any form of reproduction or distribution beyond that stated or implied in this paragraph is an infringement of copyright.



This Picture Puzzle is based on combining and extending the learning involved in several Calculating Changes activities.  
<http://www.mathematicscentre.com/calchange>  
It also complements Maths300 Lesson 162, *Multiplication in a Table Format*.

# Picture Puzzles

## To Do

1. Revisit your knowledge of rows, rectangles, multiplication and times tables.
2. Break a multiplication into parts so you can use your knowledge.

## You Need

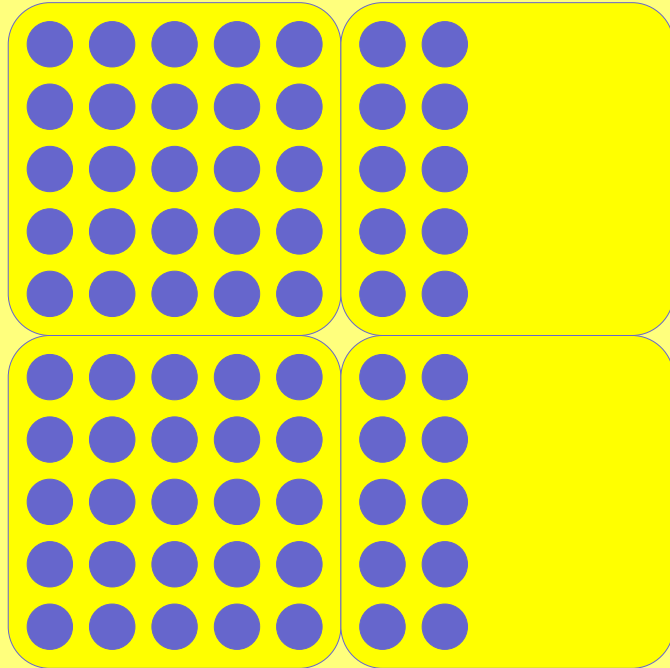
- Poly Plug or a Times Tables chart
- Drinking straws, pencils or other thin sticks
- Graph paper

Rows

# Picture Puzzles

Rows of blue plugs.

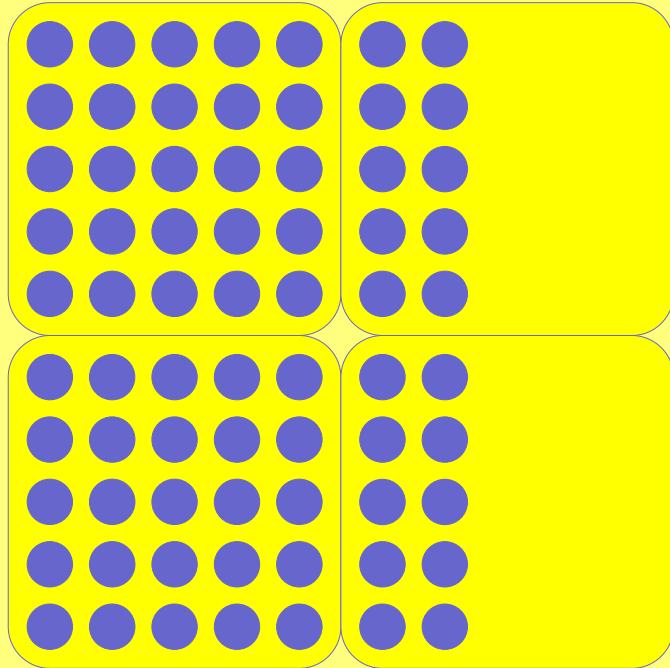
Make this with  
Poly Plug or  
cover some of a  
Times Tables  
Chart.



Rows go across your tummy.

# Picture Puzzles

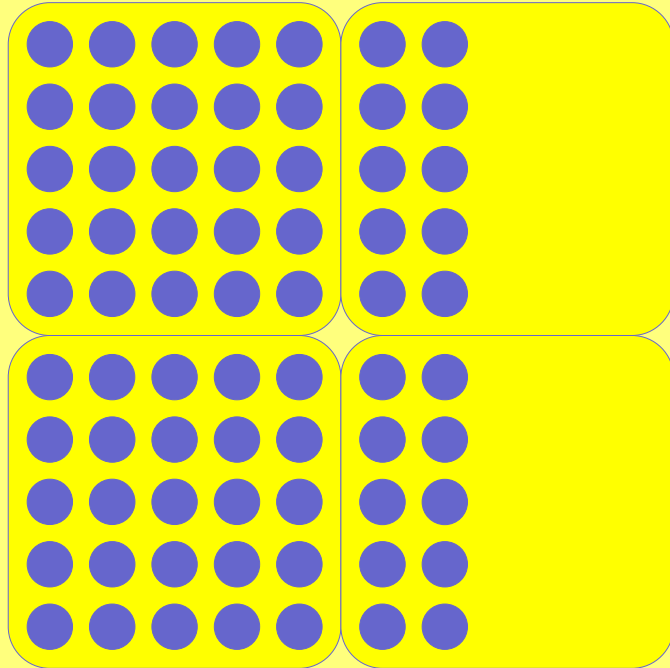
There are different ways to say this picture.



# Picture Puzzles

There are different ways to say this picture.

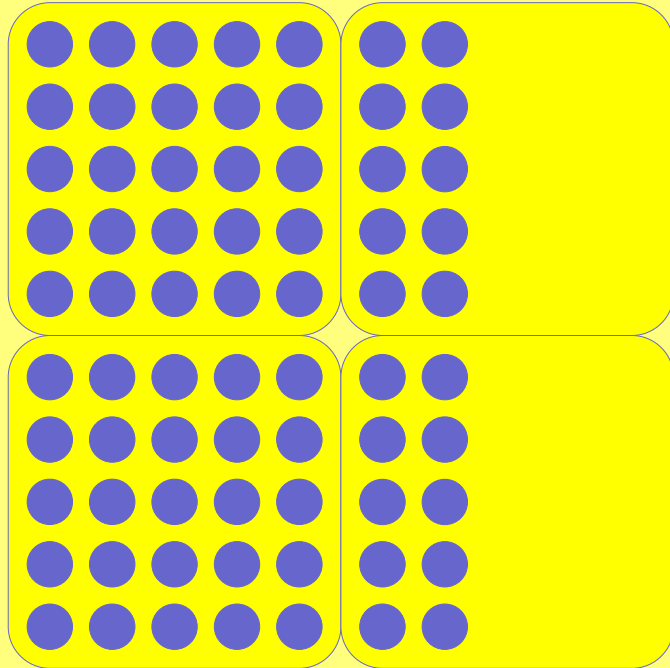
10 rows with 7 in each row



# Picture Puzzles

There are different ways to say this picture.

10 rows with 7 in each row  
10 rows of 7





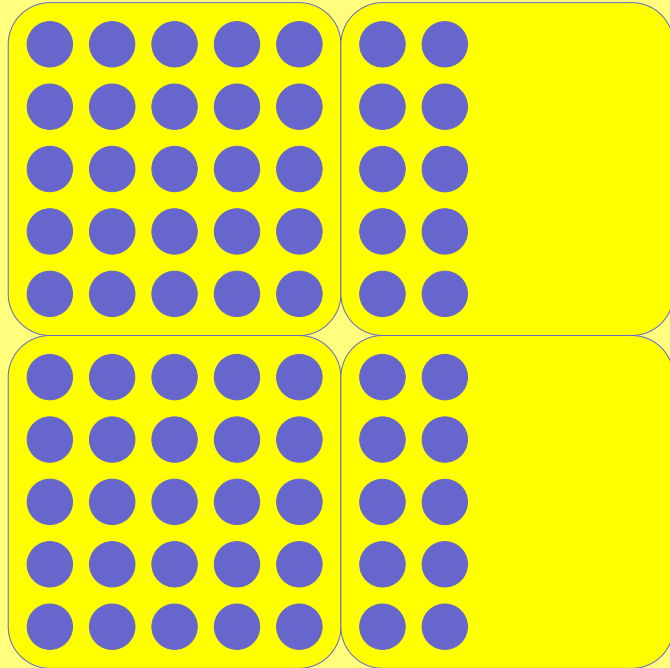
# Picture Puzzles

There are different ways to say this picture.

10 rows with 7 in each row

10 rows of 7

10 times I see 7



# Picture Puzzles

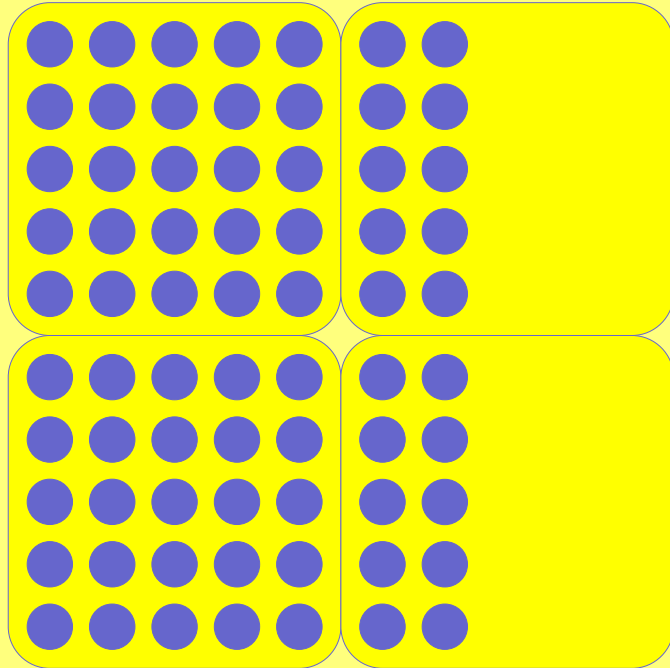
There are different ways to say this picture.

10 rows with 7 in each row

10 rows of 7

10 times I see 7

10 times 7



# Picture Puzzles

There are different ways to say this picture.

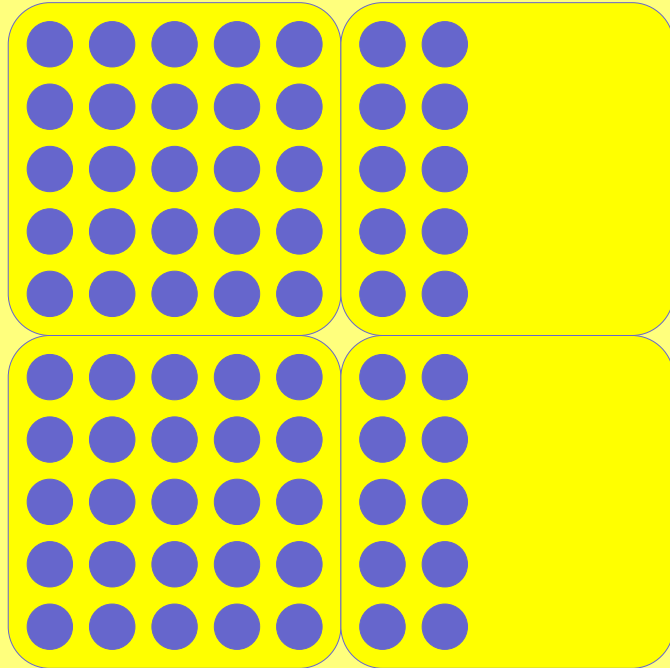
10 rows with 7 in each row

10 rows of 7

10 times I see 7

10 times 7

But they are all written  
the same way.



# Picture Puzzles

There are different ways to say this picture.

10 rows with 7 in each row

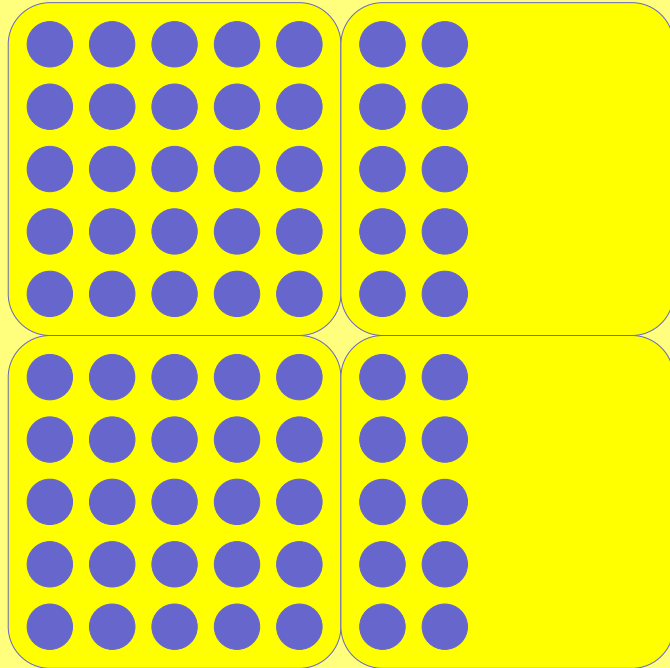
10 rows of 7

10 times I see 7

10 times 7

But they are all written  
the same way.

$10 \times 7$



# Picture Puzzles

There are different ways to say this picture.

10 rows with 7 in each row

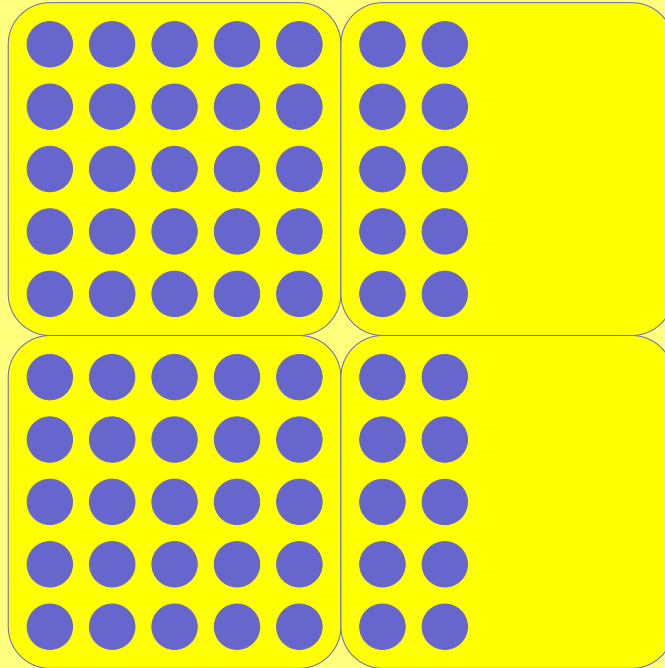
10 rows of 7

10 times I see 7

10 times 7

But they are all written  
the same way.

$10 \times 7$



Read or write  $10 \times 7$ .

Say or think *10 times 7* or *10 rows of 7*.

# Picture Puzzles

There are different ways to say this picture.

10 rows with 7 in each row

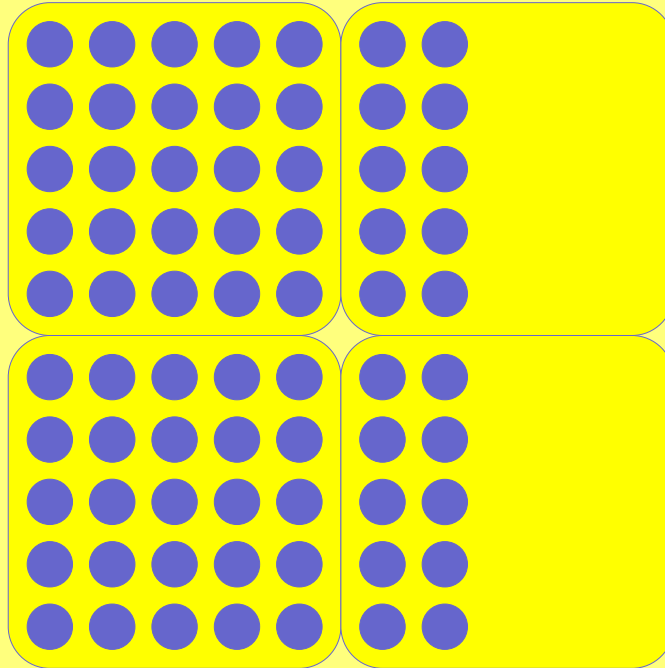
10 rows of 7

10 times I see 7

10 times 7

But they are all written  
the same way.

$10 \times 7$



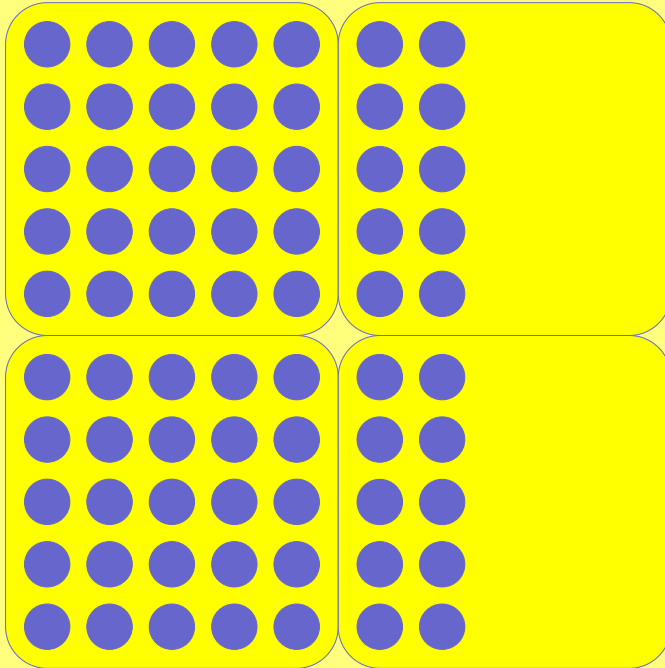
Read or write  $10 \times 7$ .

Say or think *10 times 7* or *10 rows of 7*.

Special note: They are all written this way in English speaking countries.

# Picture Puzzles

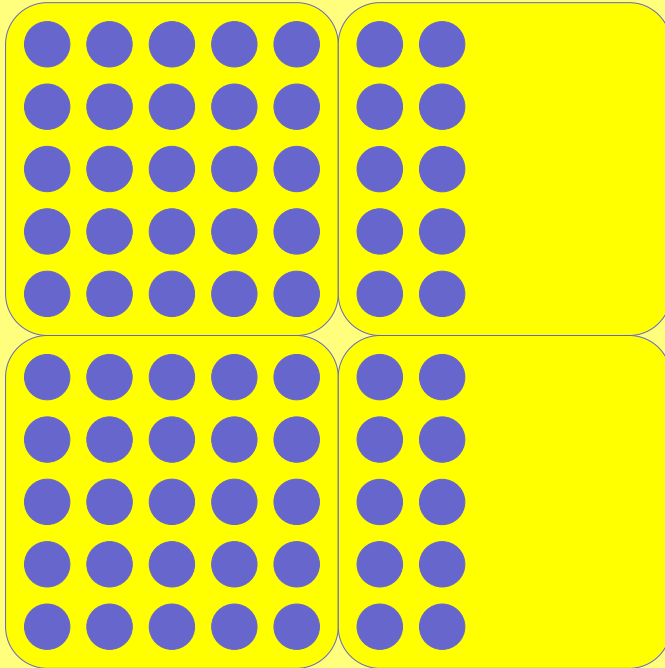
Answer in your journal.



$$10 \times 7 \\ = \dots?$$

# Picture Puzzles

Answer in your journal.



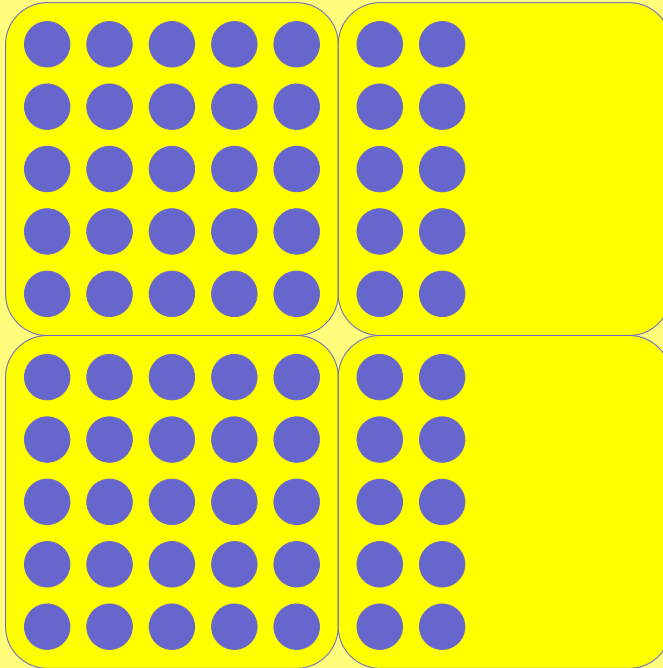
$$10 \times 7 \\ = \dots?$$

How do you know?



# Picture Puzzles

Answer in your journal.



$$10 \times 7 \\ = \dots?$$

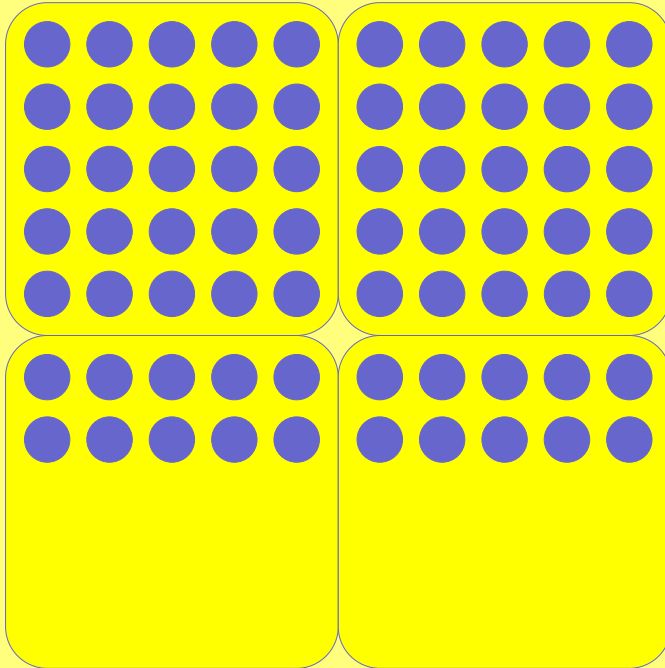
How do you know?

Can you check that  
another way?

Straws can help you find other ways.

# Picture Puzzles

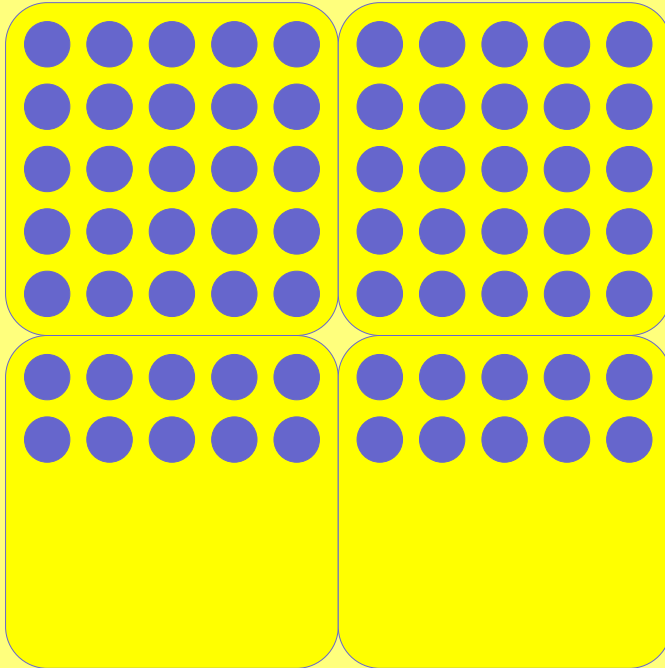
Answer in your journal.



... rows of ...  
or  
... times ...

# Picture Puzzles

Answer in your journal.

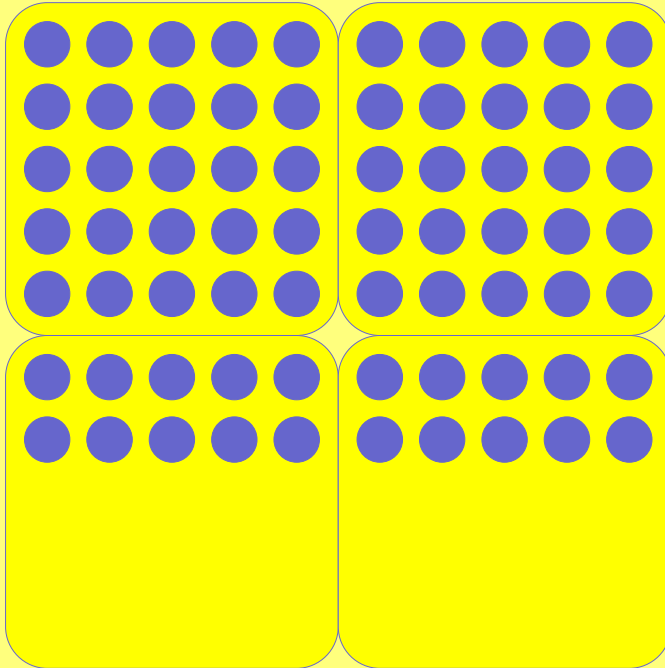


... rows of ...  
or  
... times ...

... X ...  
= ...

# Picture Puzzles

Answer in your journal.



... rows of ...  
or  
... times ...

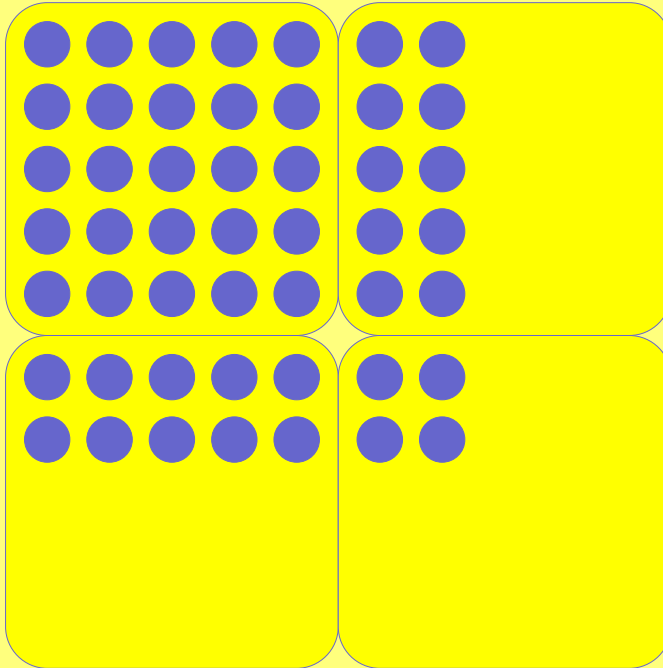
... X ...  
= ...

How do you know?

Can you check that  
another way?

# Picture Puzzles

Answer in your journal.



... X ...

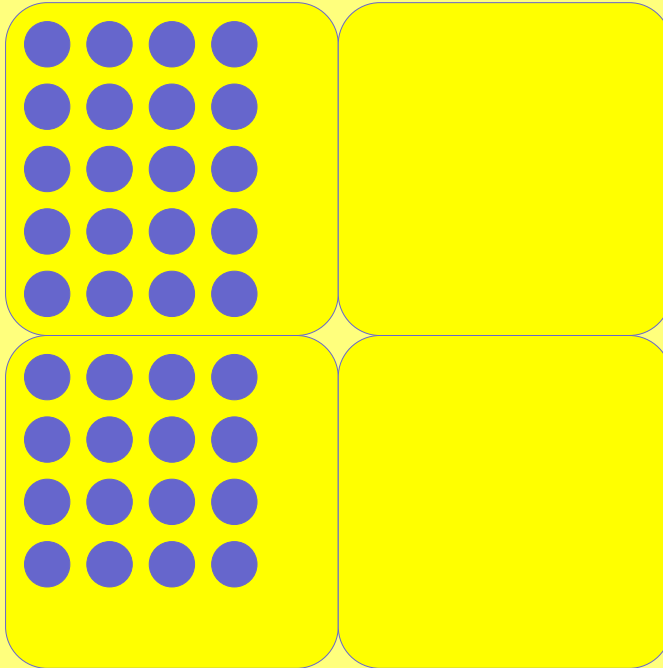
= ...

How do you know?

Can you check that  
another way?

# Picture Puzzles

Answer in your journal.



... X ...

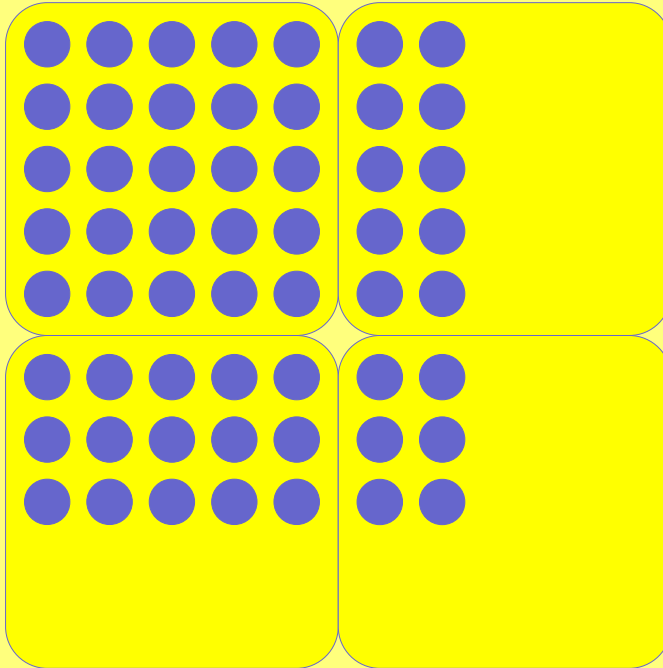
= ...

How do you know?

Can you check that  
another way?

# Picture Puzzles

Answer in your journal.



... X ...

= ...

How do you know?

Can you check that  
another way?

# Rectangles



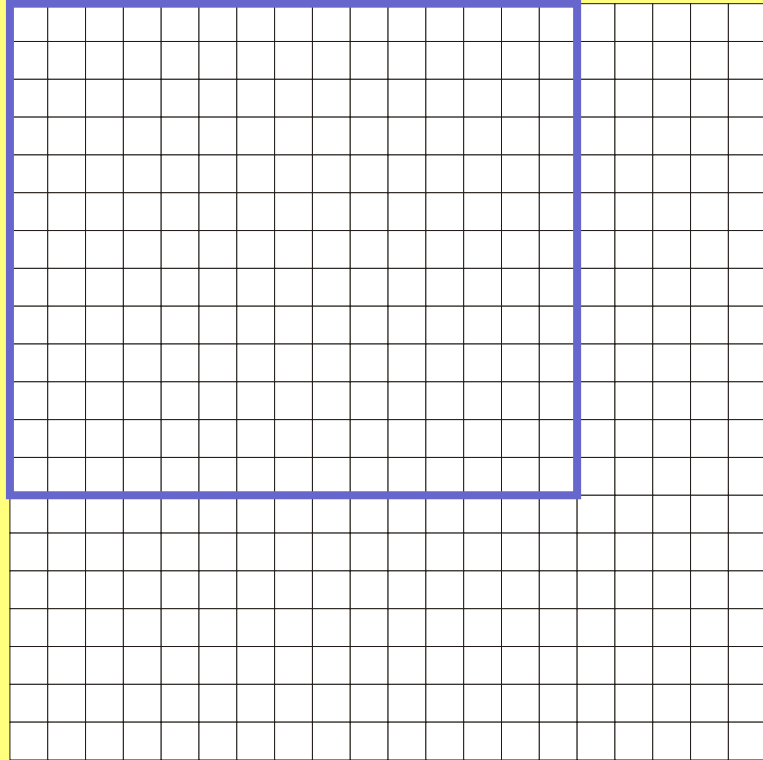
# Picture Puzzles

$$13 \times 15 = ?$$

# Picture Puzzles

$$13 \times 15 = ?$$

Draw this on  
graph paper.

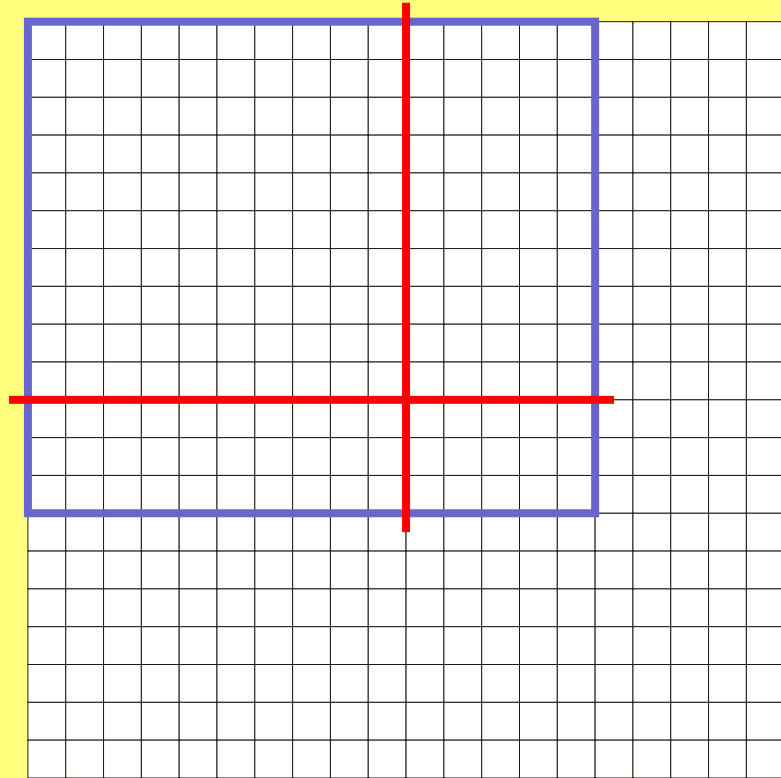


# Picture Puzzles

$$13 \times 15 = ?$$

Draw this on  
graph paper.

Break the  
problem into  
parts with  
two straws.



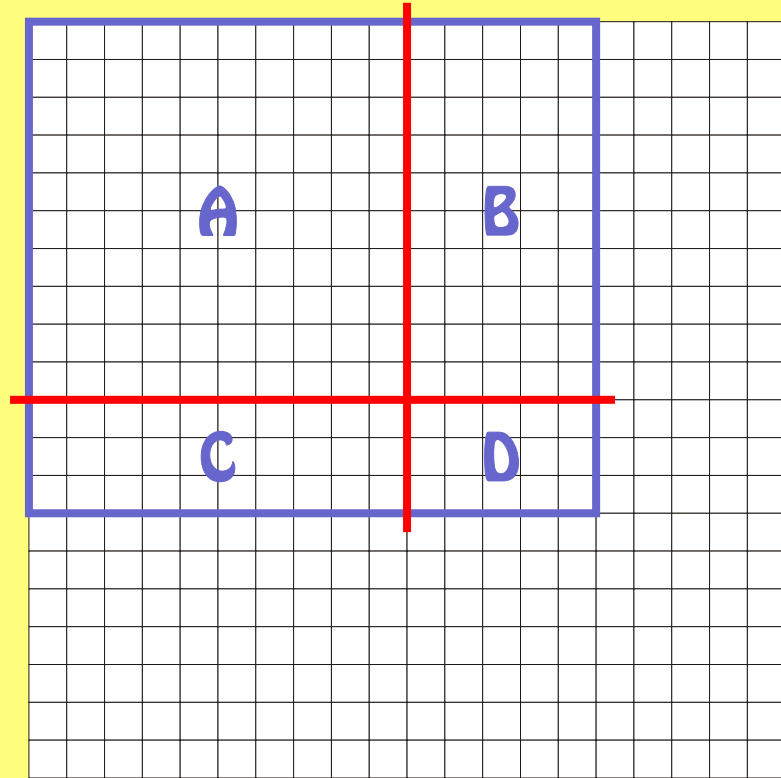
# Picture Puzzles

$$13 \times 15 = ?$$

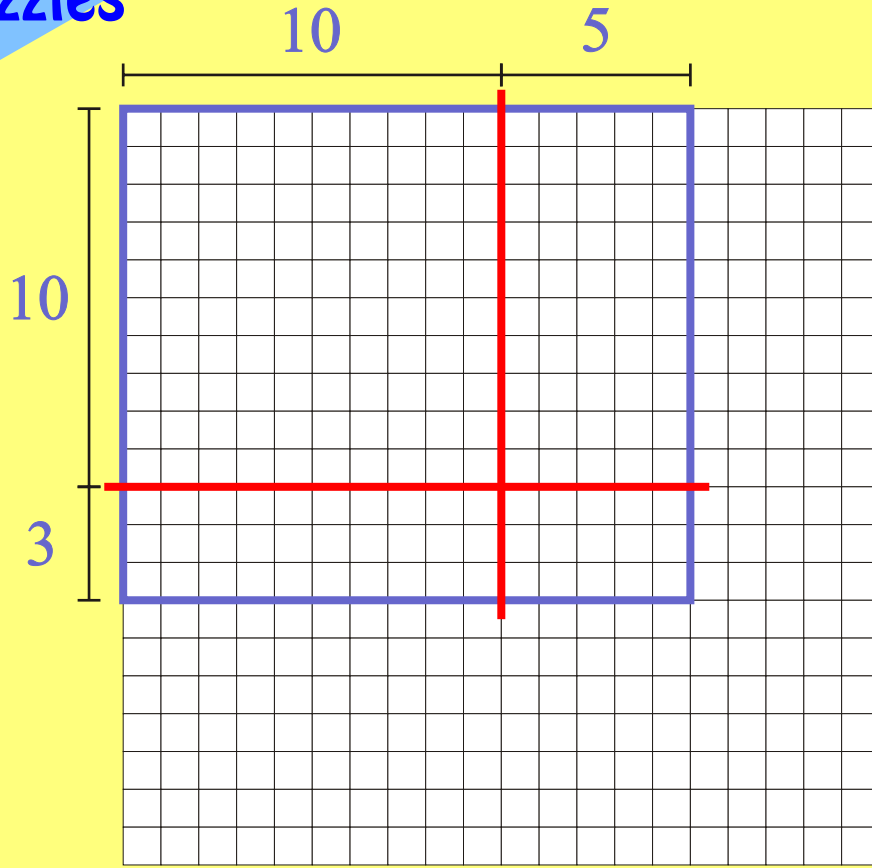
Draw this on  
graph paper.

Break the  
problem into  
parts with  
two straws.

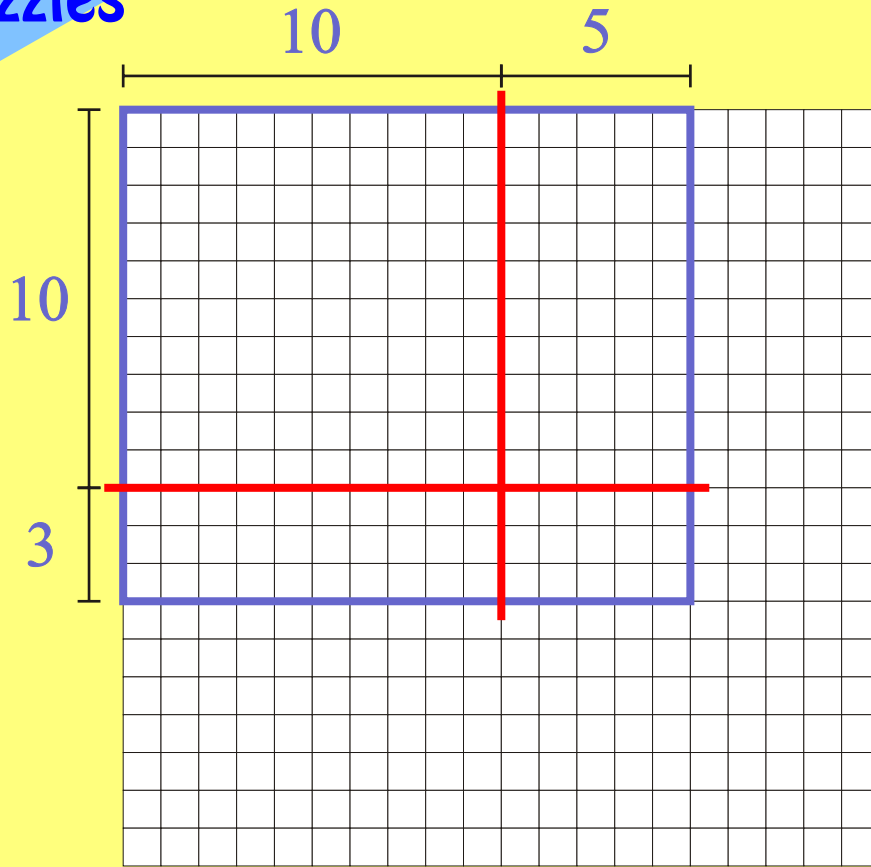
To find the  
answer, add  
the parts.



# Picture Puzzles

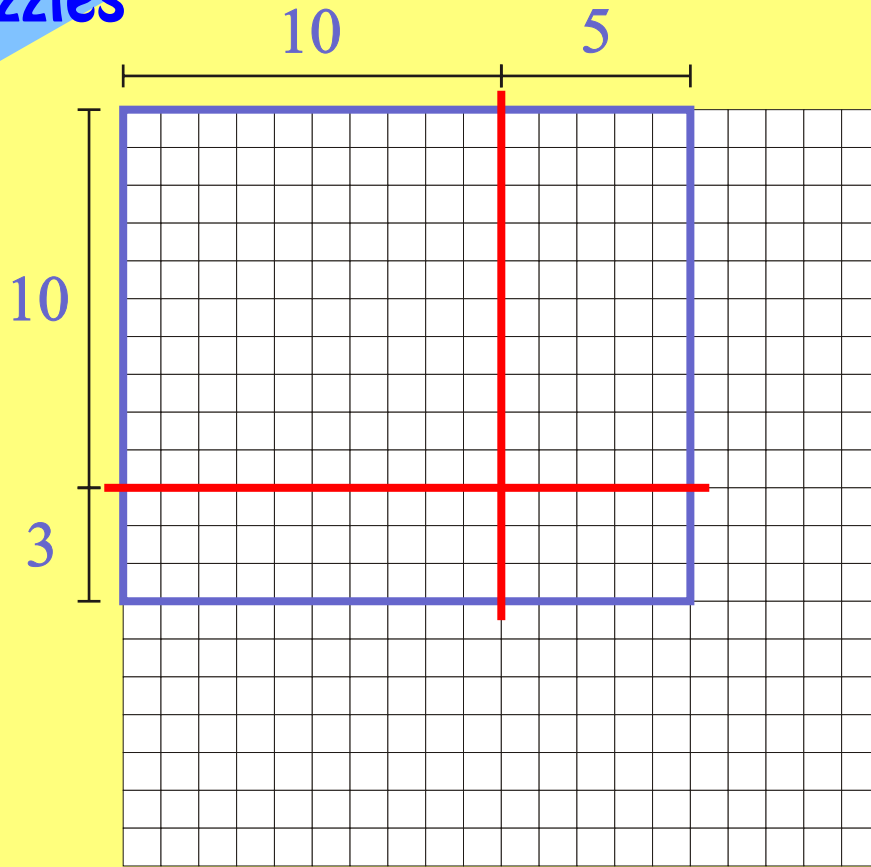


# Picture Puzzles



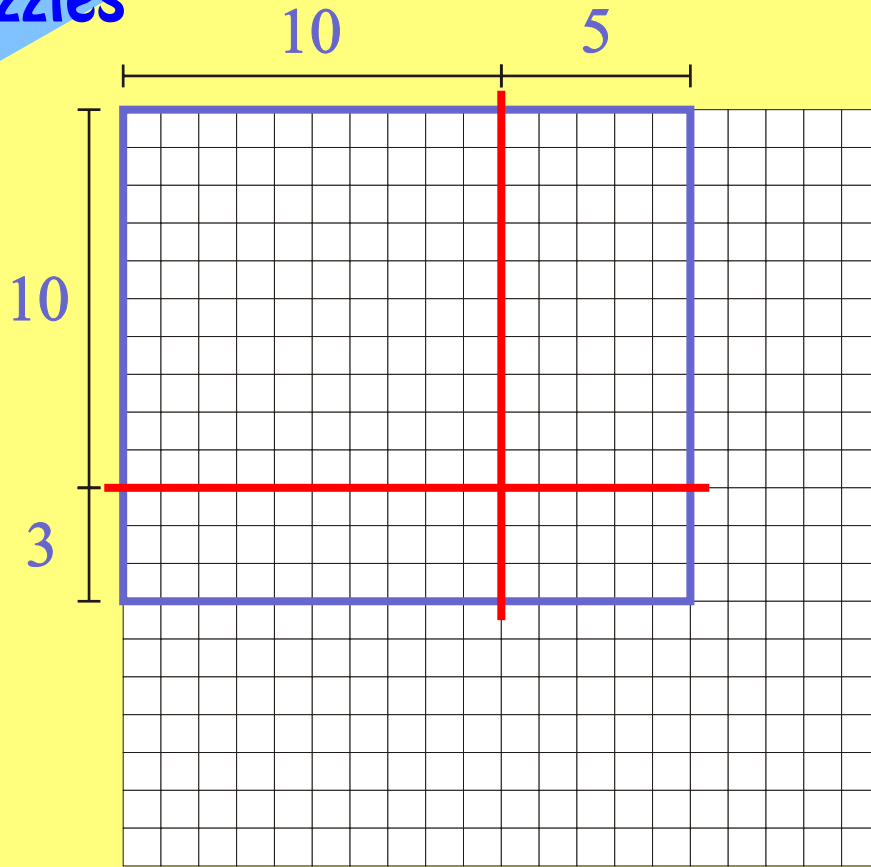
<b>X</b>	<b>10</b>	<b>5</b>
<b>10</b>		
<b>3</b>		

# Picture Puzzles



X	10	5
10	<b>100</b>	
3		

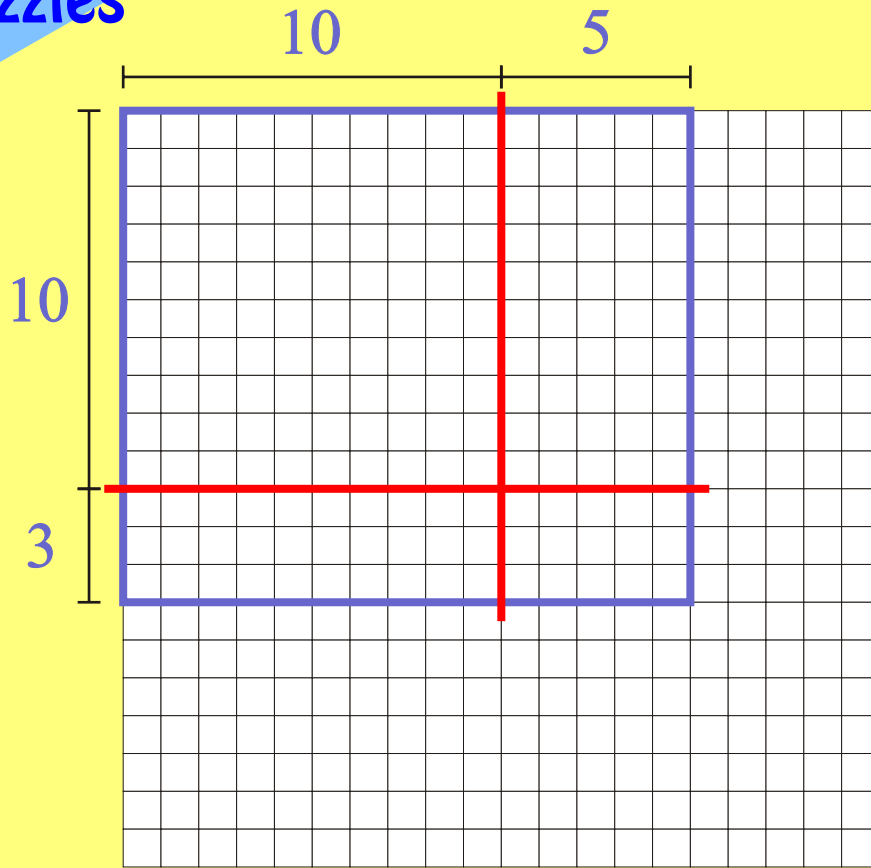
# Picture Puzzles



<b>X</b>	<b>10</b>	<b>5</b>
<b>10</b>	<b>100</b>	<b>50</b>
<b>3</b>		

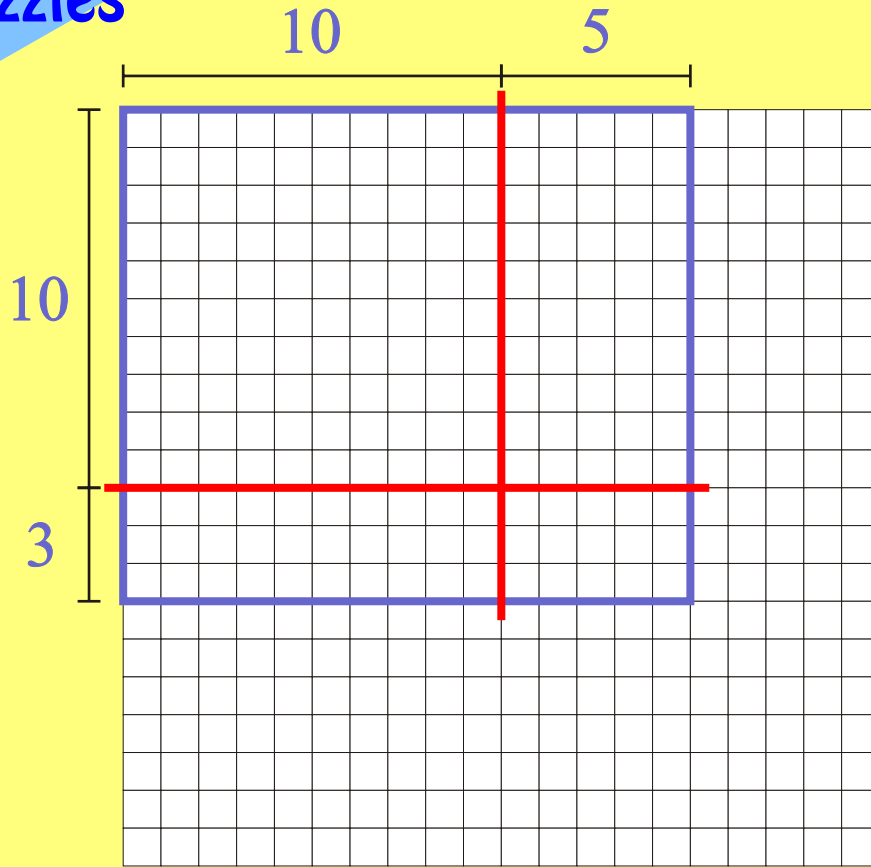


# Picture Puzzles



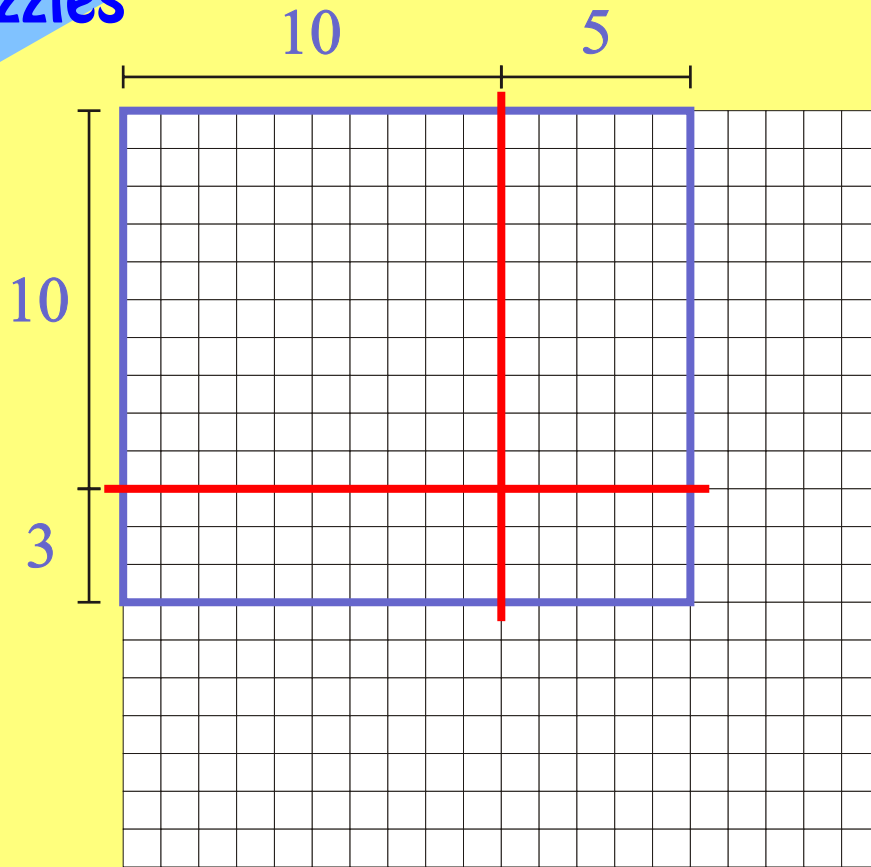
<b>X</b>	<b>10</b>	<b>5</b>
<b>10</b>	<b>100</b>	<b>50</b>
<b>3</b>	<b>30</b>	

# Picture Puzzles



<b>X</b>	<b>10</b>	<b>5</b>
<b>10</b>	<b>100</b>	<b>50</b>
<b>3</b>	<b>30</b>	<b>15</b>

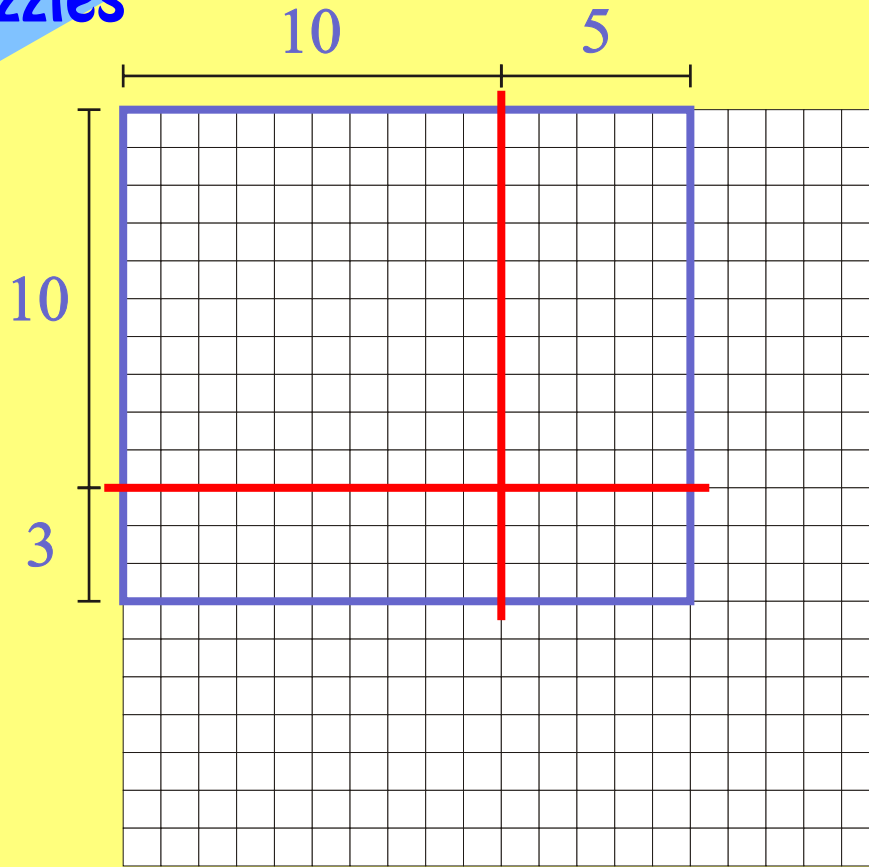
# Picture Puzzles



<b>X</b>	<b>10</b>	<b>5</b>
<b>10</b>	<b>100</b>	<b>50</b>
<b>3</b>	<b>30</b>	<b>15</b>

$$\begin{array}{r}
 13 \times 15 \\
 \quad 100 \\
 \quad \dots \\
 \quad 30 \\
 + \quad \dots \\
 \hline
 = 195
 \end{array}$$

# Picture Puzzles

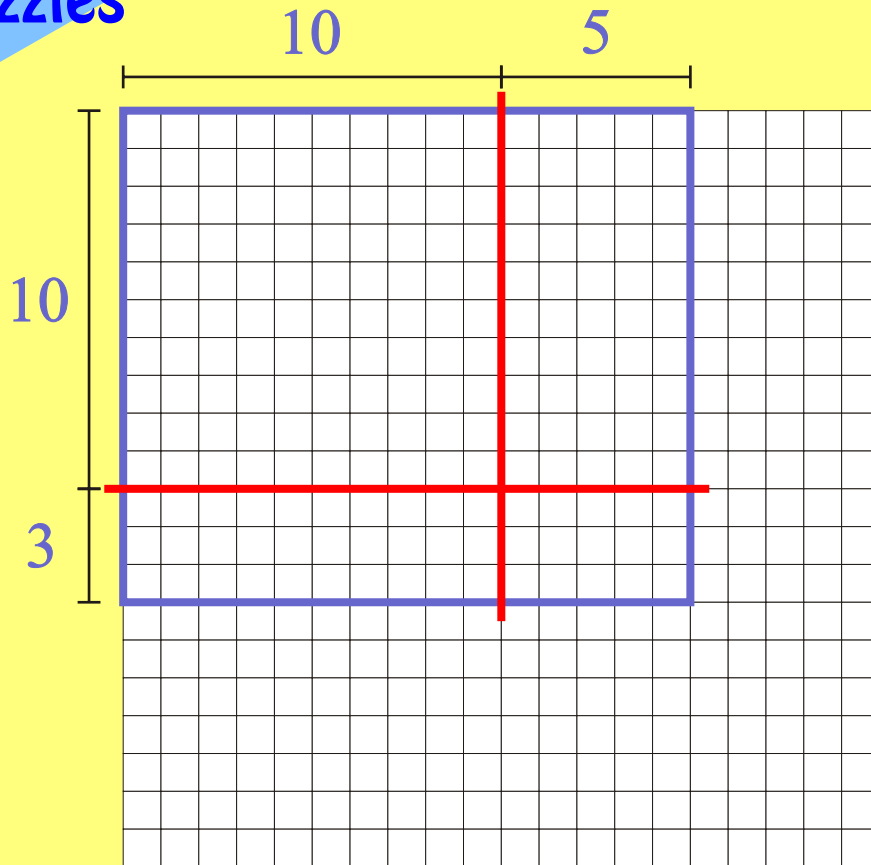


<b>X</b>	<b>10</b>	<b>5</b>
<b>10</b>	<b>100</b>	<b>50</b>
<b>3</b>	<b>30</b>	<b>15</b>

$$\begin{array}{r} 13 \times 15 \\ \quad 100 \\ \quad \dots \\ \quad 30 \\ + \quad \dots \\ \hline = 195 \end{array}$$

Copy and complete in your journal.

# Picture Puzzles

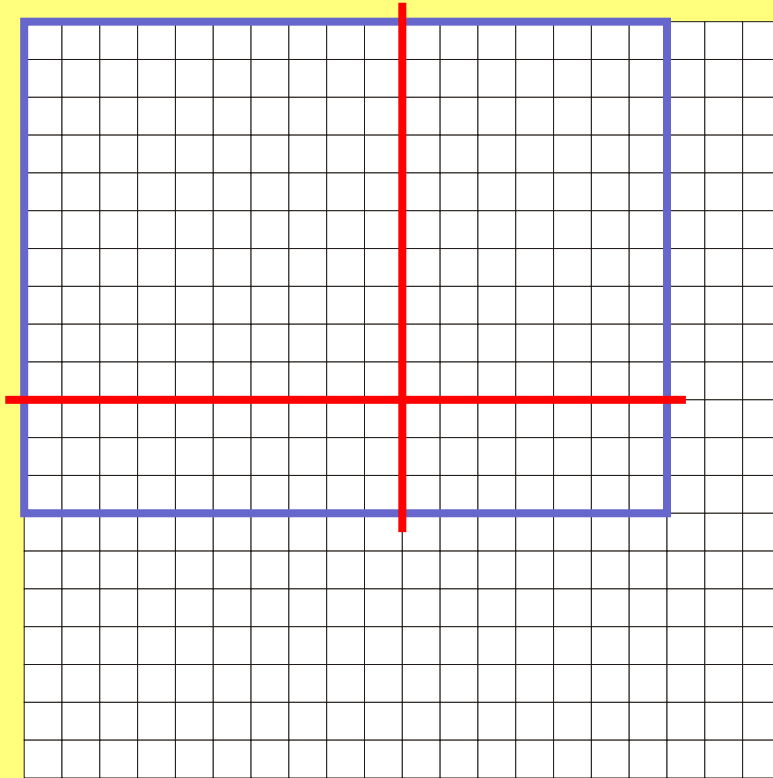


<b>X</b>	<b>10</b>	<b>5</b>
<b>10</b>	<b>100</b>	<b>50</b>
<b>3</b>	<b>30</b>	<b>15</b>

$$\begin{array}{r}
 13 \times 15 \\
 \quad 100 \\
 \quad \dots \\
 \quad 30 \\
 + \quad \dots \\
 \hline
 = 195
 \end{array}$$

Copy and complete in your journal.  
 Can you check it another way?

# Picture Puzzles



X		

.... X ....

.....

.....

.....

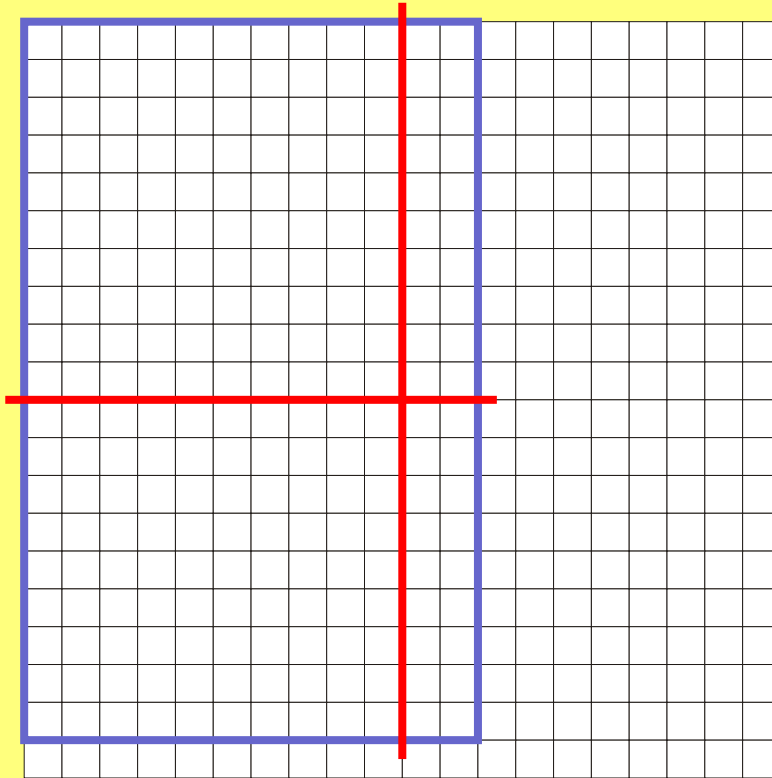
+

.....

= ....

Copy and complete in your journal.  
Can you check it another way?

# Picture Puzzles



X		

.... X ....

.....

.....

.....

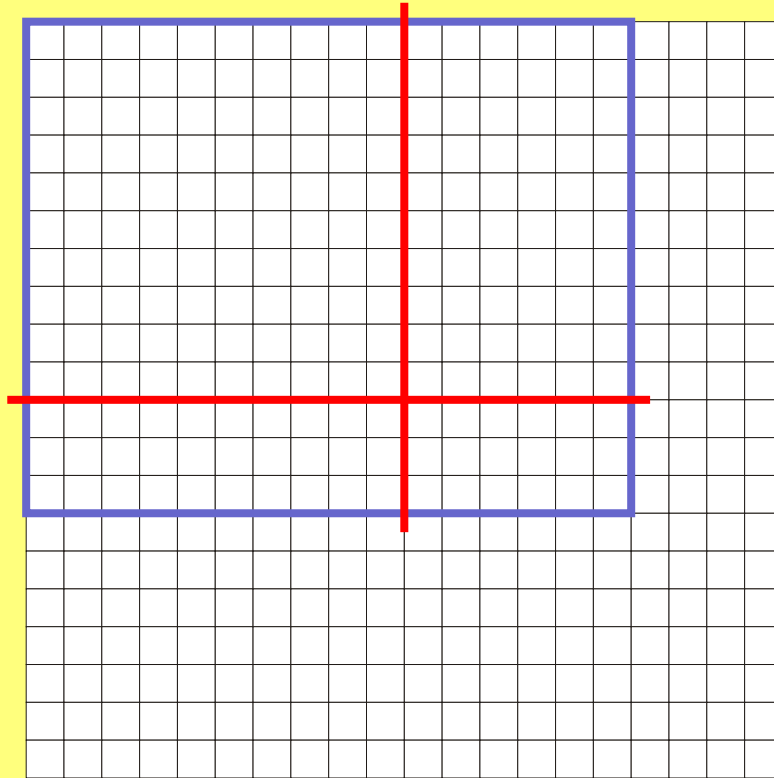
+

.....

= ....

Copy and complete in your journal.  
Can you check it another way?

# Picture Puzzles



X		

.... X ....

.....

.....

.....

+

.....

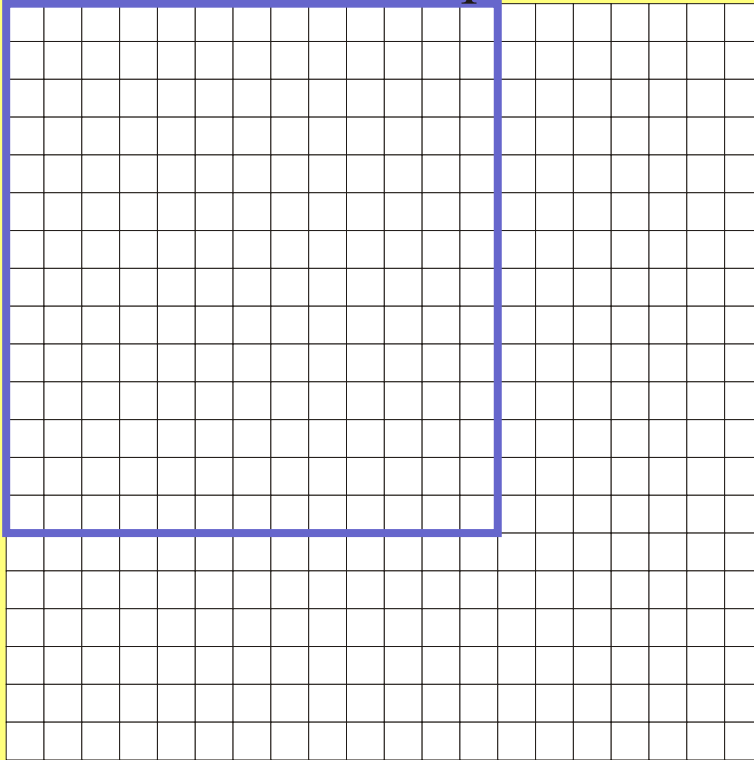
= ....

Copy and complete in your journal.  
Can you check it another way?



# Picture Puzzles

Choose where to put the straws.



X		

.... X ....

.....

.....

.....

+

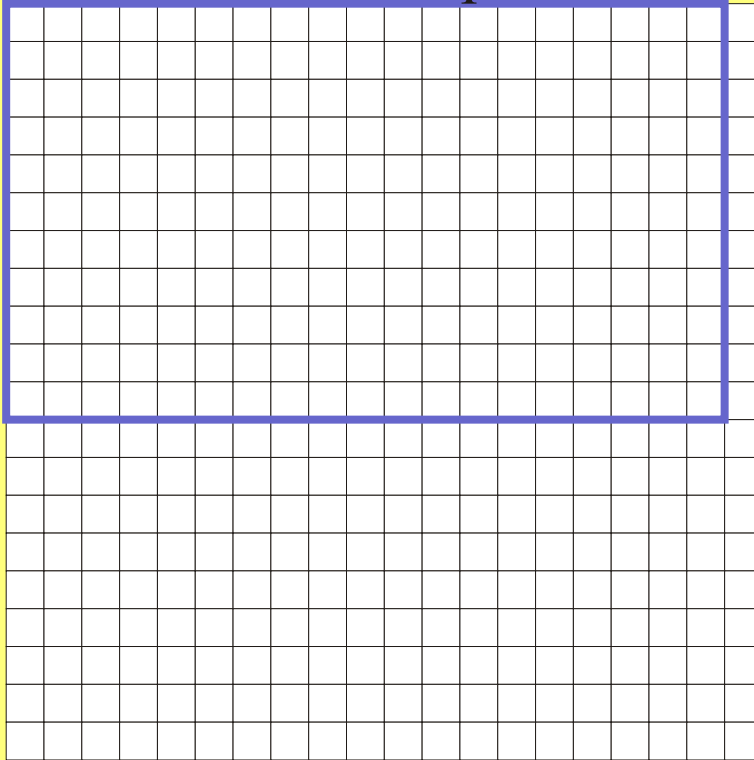
.....

= ....

Work it all out and check it another way.

# Picture Puzzles

Choose where to put the straws.



X		

.... X ....

.....

.....

.....

+

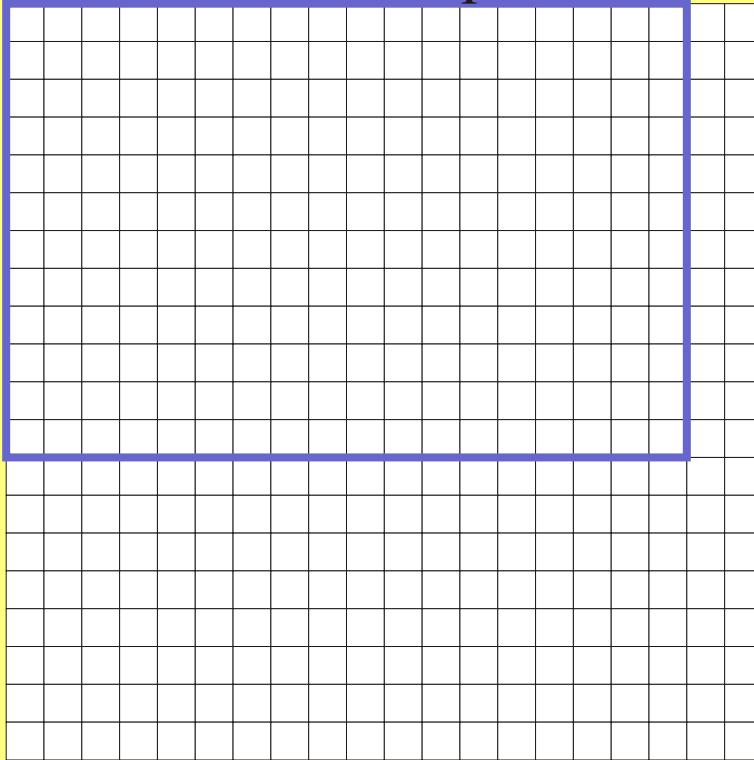
.....

= ....

Work it all out and check it another way.

# Picture Puzzles

Choose where to put the straws.



X		

.... X ....

.....

.....

.....

+

.....

= ....

Work it all out and check it another way.

Multiplication

# Picture Puzzles

16

15



X		

.... X ....

.....

.....

.....

+

.....

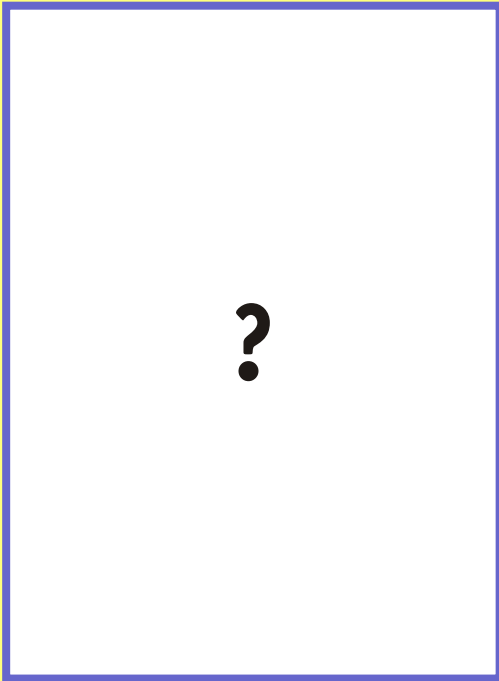
= ....

Work it all out and check it another way.

# Picture Puzzles

13

18



X		

.... X ....

.....

.....

.....

+

.....

= ....

Work it all out and check it another way.

# Picture Puzzles

19

11



X		

.... X ....

.....

.....

.....

+

.....

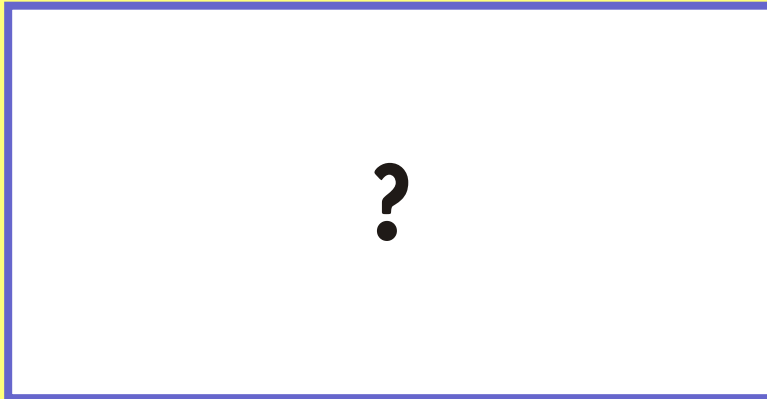
= ....

Work it all out and check it another way.

# Picture Puzzles

21

13



X		

.... X ....

.....

.....

.....

+

.....

= ....

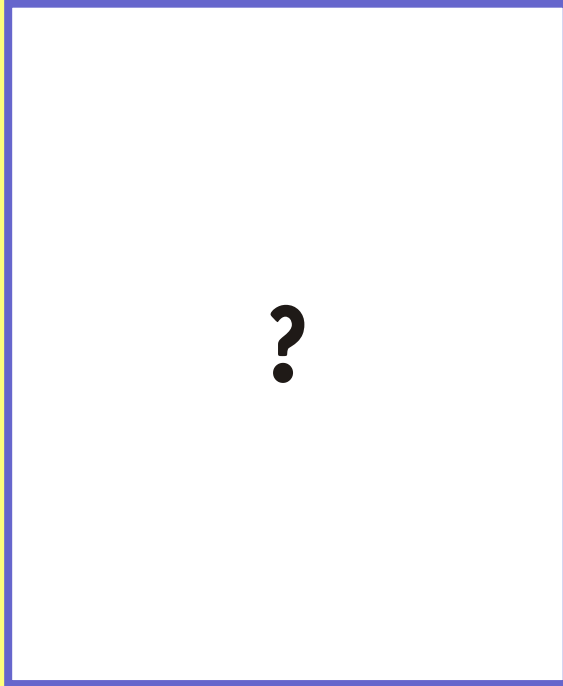
Work it all out and check it another way.



# Picture Puzzles

13

24



X		

.... X ....

.....

.....

.....

+

.....

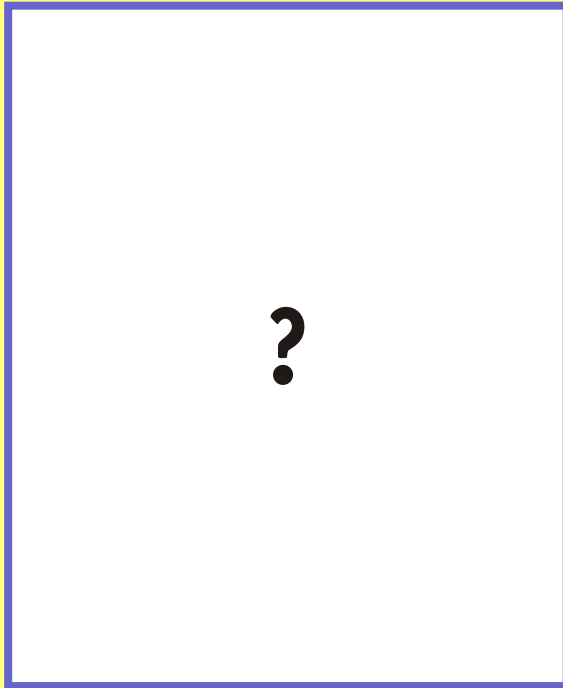
= ....

Work it all out and check it another way.

# Picture Puzzles

15

35



X		

.... X ....

.....

.....

.....

+

.....

= ....

Work it all out and check it another way.

# Picture Puzzles

Try these using a diagram in your head.

Just make the chart and show  
the working out.

$$23 \times 18$$

$$23 \times 38$$

$$45 \times 17$$

$$55 \times 55$$

$$78 \times 27$$

Try one of your own each day.

X		

.... X ....

.....

.....

.....

+  
.....

= ....

Remember to check each one another way.

**Picture  
Puzzles**

**more**

**Picture  
Puzzles**

# Picture Puzzles

What happens if there is a hundreds number?  
Example:  $27 \times 123$

What does the diagram look like?

Where do the straws go?

How would you draw the chart?

What would the working out look like?

# Picture Puzzles

THE END...

...OR IS IT?

Picture  
Puzzles