

KS2 Problem

Make the Multiplication

You have forgotten all of your multiplication facts except the following four facts:

$$1 \times 8 = 8 \quad 2 \times 8 = 16 \quad 5 \times 8 = 40 \quad 10 \times 8 = 80$$

How could you use these four facts to work out the following calculations?

$3 \times 8 =$	$4 \times 8 =$	$6 \times 8 =$	$8 \times 8 =$
$7 \times 8 =$	$9 \times 8 =$	$11 \times 8 =$	$12 \times 8 =$
$15 \times 8 =$	$20 \times 8 =$	$19 \times 8 =$	$17 \times 8 =$

For example, to find 3×8 , you could add 1×8 and 2×8 :

$$1 \times 8 + 2 \times 8 = 3 \times 8$$

$$8 + 16 = 24$$

$$\text{So } 3 \times 8 = 24$$

To find 4×8 , you could subtract 1×8 from 5×8 :

$$5 \times 8 - 1 \times 8 = 4 \times 8$$

$$40 - 8 = 32$$

$$\text{So } 4 \times 8 = 32$$

Challenge

Can you find more than one way of making each calculation using the four facts?

For example, to find 3×8 , as well as adding 1×8 and 2×8 , you could subtract 2×8 from 5×8 :

$$5 \times 8 - 2 \times 8 = 3 \times 8$$

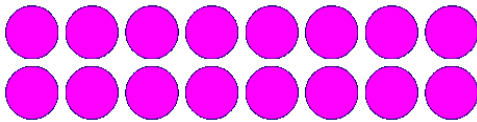
$$40 - 16 = 24$$

$$\text{So } 3 \times 8 = 24$$

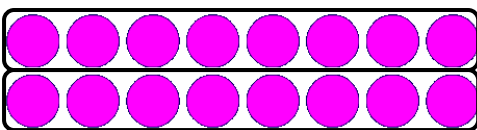
KS2 Problem

Support for Parents and Carers

Multiplication facts can be represented using arrays. An array is an arrangement of objects in equal rows and columns. For example, 2×8 can be represented using the following array:

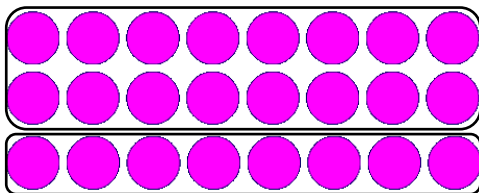


If we read 2×8 as '2 groups of 8' then we can identify the groups of 8 in the array:



We can now combine groups of 8 to make different multiplication facts, e.g.

$$3 \times 8 = 2 \times 8 + 1 \times 8$$

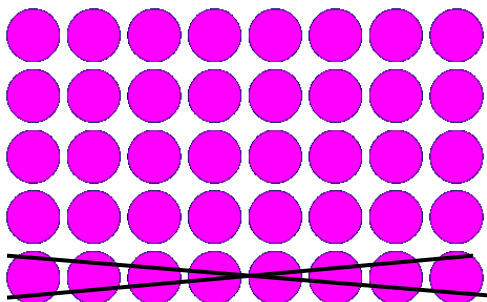


$$2 \times 8$$

$$1 \times 8$$

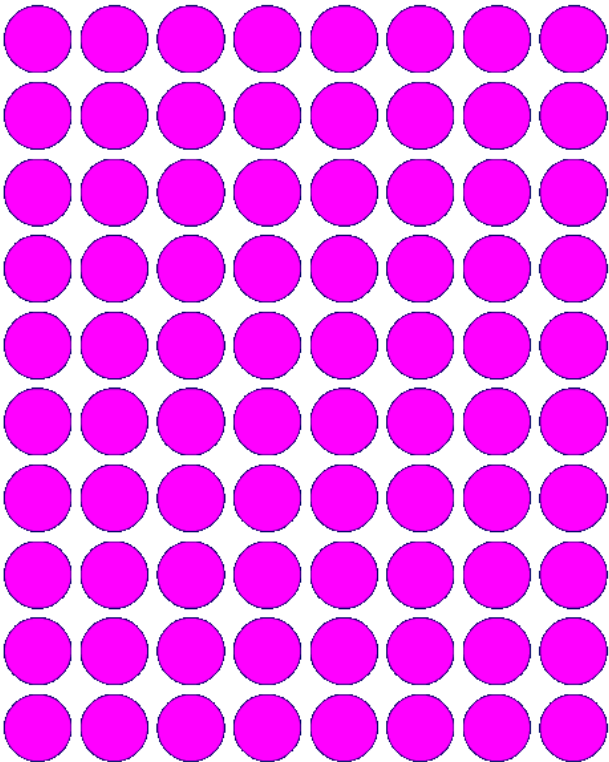
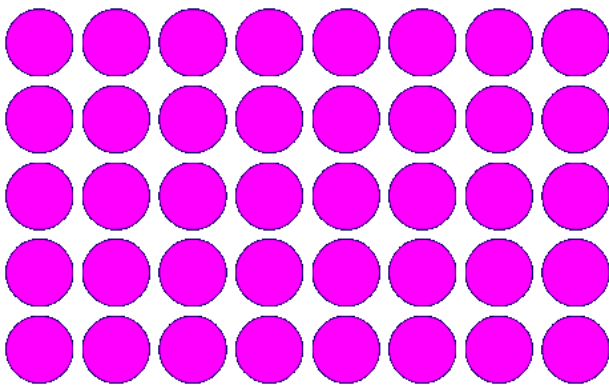
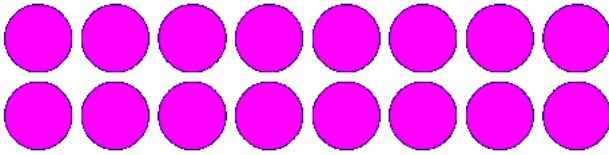
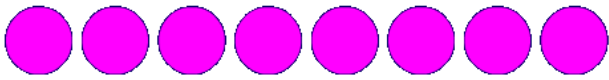
We can also subtract groups of 8 to make different multiplication facts, e.g.

$$4 \times 8 = 5 \times 8 - 1 \times 8$$



If your child is struggling to understand how to use the four facts to work out the calculations, cut out the arrays on the next page (or ask the children to create their own by drawing round an object such as a 5p coin) and put them together to 'make' the calculations.

KS2 Problem



KS2 Problem

Solution

There are many different ways to use the four facts to work out the calculations, we have listed a couple of possibilities for each fact below.

$3 \times 8 =$ $1 \times 8 + 2 \times 8$ or $5 \times 8 - 2 \times 8$	$4 \times 8 =$ $2 \times 8 + 2 \times 8$ or $5 \times 8 - 1 \times 8$	$6 \times 8 =$ $5 \times 8 + 1 \times 8$ or $2 \times 8 + 2 \times 8 + 2 \times 8$	$8 \times 8 =$ $10 \times 8 - 2 \times 8$ or $5 \times 8 + 2 \times 8 + 1 \times 8$
$7 \times 8 =$ $5 \times 8 + 2 \times 8$ or $10 \times 8 - 2 \times 8 - 1 \times 8$	$9 \times 8 =$ $10 \times 8 - 1 \times 8$ or $5 \times 8 + 2 \times 8 + 2 \times 8$	$11 \times 8 =$ $10 \times 8 + 1 \times 8$ or $10 \times 8 + 2 \times 8 - 1 \times 8$	$12 \times 8 =$ $10 \times 8 + 2 \times 8$ or $10 \times 8 + 5 \times 8 - 2 \times 8 - 1 \times 8$
$15 \times 8 =$ $10 \times 8 + 5 \times 8$ or $10 \times 8 + 10 \times 8 - 5 \times 8$	$20 \times 8 =$ $10 \times 8 + 10 \times 8$ or $10 \times 8 + 5 \times 8 + 5 \times 8$	$19 \times 8 =$ $10 \times 8 + 10 \times 8 - 1 \times 8$ or $10 \times 8 + 5 \times 8 + 2 \times 8 + 2 \times 8$	$17 \times 8 =$ $10 \times 8 + 5 \times 8 + 2 \times 8$ or $10 \times 8 + 10 \times 8 - 2 \times 8 - 1 \times 8$