UNIT
10

SUPPLEMENTARY TEACHING SEQUENCES

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PURPOSE AND *PROMPTS*

SEQUENCE 1

Multiplication sequence

RESOURCES:
ITP 'Multiplication Facts' (on the accompanying CD-ROM in ITPs Index) or board where arrays can be constructed
1–6 dice
Digit cards

This will help children to relate arrays to multiplication and division facts.

STEP 1

Use the ITP 'Multiplication Facts' and set the shapes in the grid to counters.

Show an array of three rows and five columns on the board or using the ITP.

Q What multiplication/division facts could this represent?

Check responses and share different answers.

$3 \times 5 = 15$

$5 \times 3 = 15$

$15 = 3 \times 5$

$15 = 5 \times 3$

$15 \div 5 = 3$

$15 \div 3 = 5$

$3 = 15 \div 5$

$5 = 15 \div 3$

Invite a child to extend the array to show three rows and six columns on the board (i.e. add one more column). (If using the ITP, demonstrate changing the counters to blocks in preparation for children using squared paper.)

Q What multiplication/division facts might this represent?

This will help children understand how multiplication arrays can be combined

STEP 2

Ask children to make arrays on squared paper (up to ten columns of four) and ask them to record associated multiplication and division

facts. Organise the group so that, between them, the children make all the arrays for the 4 times table.

Display the arrays to show the systematic build-up.

Can children describe the pattern?

(Note that when using the ITP to generate the 4 times table you enter 4 in the row box, as this then generates columns with four elements.)

Then ask children to use two arrays to put together.

Q What do we get?

e.g. five fours and three fours gives us eight fours.

Q What others can we make?

Can children recognise combinations of number facts?

Q What if we wanted to find out 11 fours? Could we combine any of the arrays we have already made?

This will help children understand how known multiplication facts can be combined to create multiplication facts beyond 10.

Combinations suggested might include:

4 × 2 and 4 × 9

4 × 3 and 4 × 8

4 × 4 and 4 × 7

4 × 5 and 4 × 6

and (ideally)

4 × 10 and 4 × 1

Have some arrays already prepared, e.g. 4 × 15, 4 × 16.

Q How could the 4 × 15 array be cut up?

Collect in ideas, and test them out with their arrays.

Q What if we wanted to find out 4 × 12, 4 × 13, 4 × 15?

Ask the group to explore multiplication facts and identify combinations of arrays up to 4 × 16.

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STEP 3

This will help children to understand the grid method of multiplication. It provides a model of partitioning an array.

Either:

Use the ITP to generate 16 columns of four counters and discuss where the best place might be to partition the array to make it easier to find how many there are altogether.

Or:

Draw 16 columns of four counters on the board and proceed as above.

At some stage, draw a line after the tenth column.

Sketch a 4 × 16 grid. Partition it at 4 × 10 and, with help from the children, write 10, 6, 4, 40 and 24 in appropriate places.

	10	6
4	**40**	**24**

Answer: 40 + 24 = 64

Ask the children to draw rectangles 3 × 13, 6 × 18, etc. and partition them and write the partial products (30 and 9 and 60 and 48) in appropriate places.

STEP 4

This progresses to a rectangle grid method using numbers greater than 20.

Progress to larger two-digit numbers, drawing rectangles to show that:

- 4 × 20 is the same as 4 × 10 plus 4 × 10;
- 4 × 30 is the same as 4 × 10 plus 4 × 10 plus 4 × 10, etc.

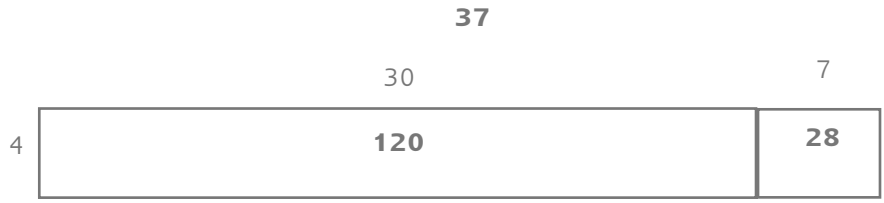
Discuss how you might find 4 x 37. Initially partition 37 as 10 + 10 + 10 + 7, drawing a rectangle that reflects this.

37

	10	10	10	7
4	**40**	**40**	**40**	**28**

PURPOSE AND *PROMPTS*

Later, remove the lines separating the tens and discuss the resulting diagram.



You might need to revise multiplying multiples of 10 by single-digit numbers.

Invite children to practise by rolling two 1–6 dice to create a TU number and turning over a digit card to select the number to be multiplied by. (Ensure that the numbers on the cards reflect the tables learned at this stage.)

Draw rectangles and use the grid method to show the multiplication fact.

This progresses to two-digit by two-digit multiplication.

STEP 5

This sequence of activities can be extended to teach HTU × U and TU × TU. This provides a bridge to Year 5 objectives and should enable access to the material in Year 5 unit plan: Unit 2, Multiplication and division 1, Autumn, Day 3.

The ITP can be used to introduce two-digit by two-digit multiplication by setting up an array of, say, 11 rows and 14 columns. The optimum partition for both numbers is 10 + 1 and 10 + 4, giving an easily calculated 100, 40, 10 and 4 (154).