Multiplication

Resources
Number lines
Arrays
Bead strings
Arrow cards
Numicon
Hundred Squares
Objects/counters
Dienes

Context
Money
Measures
Fractions
Decimals
Percentages

Through discussion, children need to:

1. Read, understand and interpret the question.
2. Identify the calculation as a number sentence.
3. Think about skills that will help to solve the calculation (doubling, number bonds, partitioning, multiples)
4. Choose an appropriate method.
5. Record the number sentence and solution.
6. Interpret solution (rounding? units?)
7. Check calculation

Progression in Number
U x U
TU x U
HTU x U
TU X TU

Any whole number x TU/HTU/ThHTU

U.t x U

Using and applying question starters

What could you write down or draw to help you think about this problem?

Show me how to solve this problem using practical objects.

If someone had forgotten the ? times table, what tips would you give them to work it out?

Stage 1

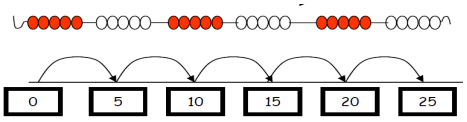
- Count up in 2's up to 20
- Count up in 5's and 10's up to 100.
- Counting concrete objects in 2's, 5's and 10's
- Know doubles and halves to 20.

How could you count these shells? What is the quickest way to count them?

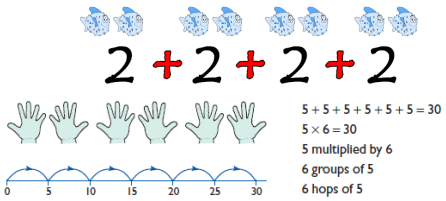
Continue this count. Stop when you get to 20. 2, 4, 6, ….

Stage 2

- Counting on or back in steps of 2, 5 and 10 using images.



- Understand multiplication as repeated addition.



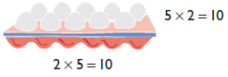
2 + 2 + 2 + 2 = 8
4 x 2 = 8
2 multiplied by 4
4 lots of 2

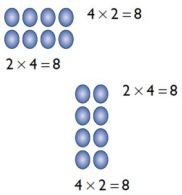
Count in twos to find how many socks on the washing line.

What is the cost of 12 stamps at 5p each?

Stage 3

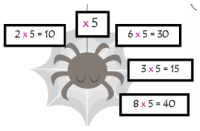
- Understand multiplication as arrays.





- Start to know multiplication facts for 2, 5 and 10 times tables.

- Start to count in threes and fours.



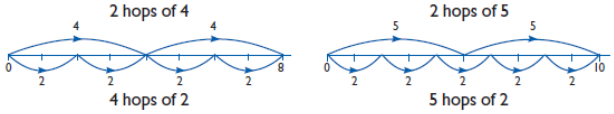
How can you work out the 4 times table from the 2 times table? The 6 times table from the 3 times table?

What multiplication and division facts does this array show?

Use a variety of vocabulary
5 'jumps' of 3. 5 lots of 3 5 x 3

Stage 4

- Use number lines for repeated addition.
- Move from structured to unstructured numberlines



- Know multiplication facts for 2,3,4,5,10 times tables.
- Recognise multiples of 2, 5 and 10 up to 1000.
- Understand the effect of multiplying by 10 and 100.

Th	H	T	U
		4	3
4	3	0	0

43 x 100
Each digit moves two columns to the left and zero is used as a place holder *

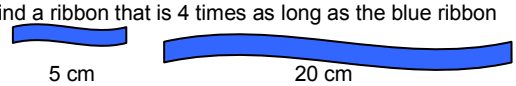
How many fives make the same number as three tens?

What is the relationship between 4 x 7 = 28, 6 x 7 = 42 and 10 x 7 = 70?
What is the missing number in this statement: ? X 5 = 35. How do you know?

How many 10ps do you need to make £2.30?

☐ x 5 = 20 3 x ■ = 18 ☐ x ○ = 32

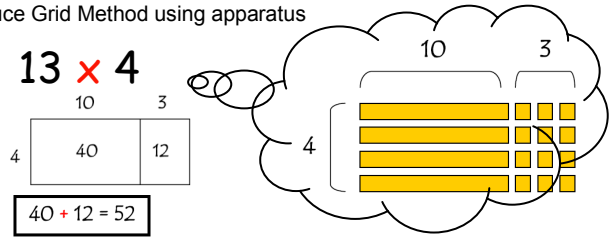
Scaling:
e.g. Find a ribbon that is 4 times as long as the blue ribbon



* reinforce that moving to the left means the columns are worth **more**

Stage 5

Introduce Grid Method using apparatus



- Know all multiplication facts for the 1-12 times tables.

What is 4 x 2? What is 10 x 2? How could we use these facts to work out 14 x 2?

How does 6 x 4 = 24 help you to know the answer to 6 x 40? And the answer to 240 ÷ 6?

One length of the swimming pool is 25 metres. Jane swims 5 lengths of the pool. How far does Jane swim altogether? How can you check that your answer makes sense?

What is 20 x 3? Now, what is 21 x 3, what about 19 x 3?

Stage 6

- Mentally multiply a 2 digit number by a multiple of 10

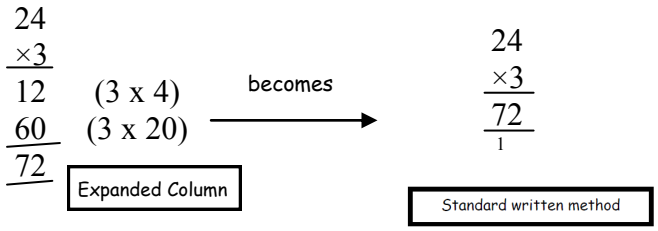
20 x 14 = (2 x 14) then x10 → 28 x 10 = 280
or (10 x 14) then x2 → 140 x 2 = 280

- Use known facts to solve similar multiplication problems

8 x 4 = 32 so 80 x 4 = 320 or 0.8 x 4 = 3.2

- Extend Grid Method to become **Formal Short** Method TU x U

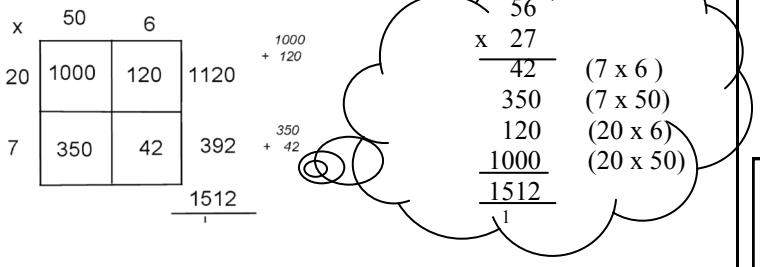
The next step is to represent the method of recording in a column format, but showing the working. Draw attention to the links with the area and grid method above.



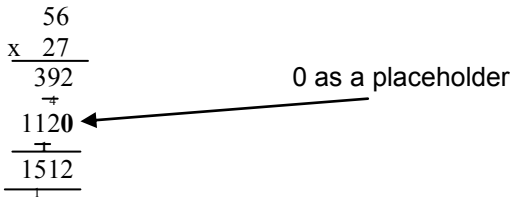
Reduce the recording, showing links to the grid method.

- Extend to TU x TU **Formal Long** Multiplication

56 x 27 is approximately 60 x 30 = 1800.



Reduce the recording further



Write in the missing numbers:
5 x 70 = ?, 600 x 4 = ?, 4 x ? = 200

What is 50 times 90? A packet of plums costs 68p. Mark bought 3 packs of plums. How much change did he get from a £5 note?
Explain to the class why you solved the problem in that way.

How many times bigger is 2400 than 6? How do you know?

Ann says that 38 x 10 = 308. Explain how you know she is wrong.

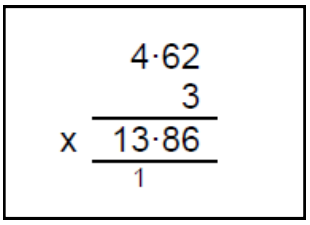
If 7 × 8 = 56 what is 0.07 × 8? Give some other decimal facts that are linked to this multiplication fact. What number multiplied by 8 gives 4.8?

Explain how you can use the fact 7 × 8 = 56 to find the answer to 5.6 ÷ 0.8.

Top Tip
Children will need lots of experience of short multiplication before they tackle formal long multiplication

Stage 7

- Extend formal written method to include decimals



Extending column method to include decimals

How would you explain to someone how to multiply a decimal by ten?
Explain how you would solve these problems. Would you use a calculator? Why or why not?
185 people go to the school concert. They pay £1.35 each. How much ticket money is collected?
What number multiplied by 8 equals 4.8?
How else could you make an answer of 4.8?

Harry has a regular octagonal shaped box. He wants to decorate it with ribbon all around the edge. Each side measures 9.58cm. How much ribbon does he need altogether?