

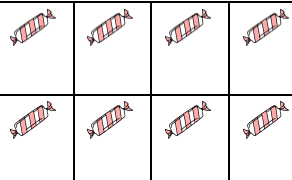


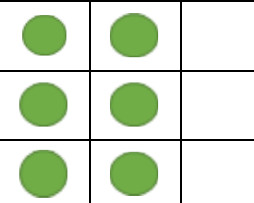
Multiplication

## Multiplication - Stage 1

Solve one-step multiplication problems using concrete objects, pictorial representations, and arrays with the support of the teacher.

### 1. Multiply using arrays


Array of objects Two rows of 4 sweets $4 + 4 = 8$


Array of counters Three rows of 2 counters $2 + 2 + 2 = 6$

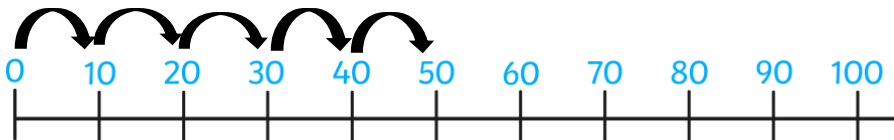
### 2. Multiplying using repeated addition

$$10 \times 4 = 40$$

$$10 + 10 + 10 + 10 = 40$$

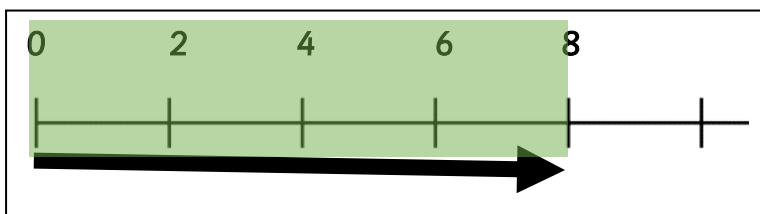
### 3. Multiply using a guided number line

$$10 \times 5 = 50$$



### 4. Draw own number line

$$2 \times 4 = 8$$



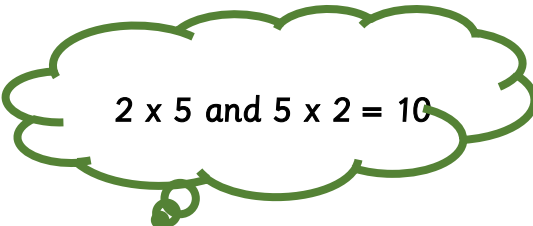
## Key vocabulary

Groups of, lots of, times, array, altogether, multiply, count.

## Multiplication – Stage 2

*Show that multiplication of two numbers can be done in any order (commutative) and solve problems involving multiplication using mental methods and multiplication facts.*

### 1. Multiply mentally and use commutativity


$$2 \times 5 \text{ and } 5 \times 2 = 10$$

Mentally x 2, x 5, x 10 times tables

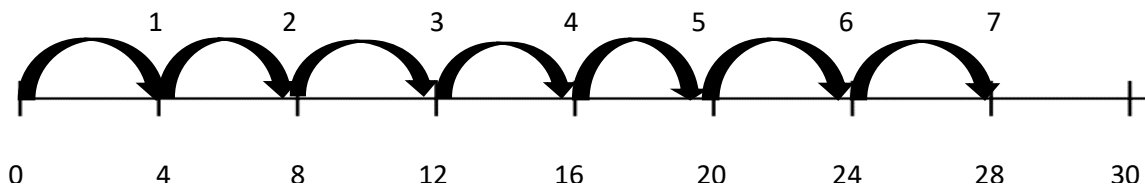
2, 4, 6, 8, 10 ....

5, 10, 15, 20 ....

10, 20, 30, 40 ....

### 2. Multiply using a number line

e.g.,  $4 \times 7 = 28$



### 3. Partitioning Tens/Ones x Ones

$$15 \times 2 = 30$$

$$10 \times 2 = 20$$

$$5 \times 2 = 10$$

## Key vocabulary

*Groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative, sets of, equal groups, times as big as, once, twice, three times.*

## Multiplication – Stage 3

*Calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods.*

### Expanded column multiplication

#### 1. Tens/Ones x Ones with brackets

		3	6		
x			3		
		1	8	(6 x 3)	
		9	0	(30 x 3)	
**	1	0	8		
	↗				

#### 2. Tens/Ones x Ones

		3	6
x			3
		1	8
		9	0
**	1	0	8
	↗		

\*\*Cross out 1 after use

### Key vocabulary

*Groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative, sets of, equal groups, times as big as, once, twice, three times, partition, grid method, multiple, product, tens, ones, value.*

## Multiplication - Stage 4

*Multiply two-digit and three-digit numbers by a one-digit number using formal written layout and to become fluent in the formal written method of short multiplication.*

### Compact column multiplication

1. Tens/Ones x Ones –  
No carrying

	1	3
x		3
	3	9

2. Tens/Ones x Ones -  
Carrying

	1	3
x		4
	5	2
	/	

3. Hundreds/Tens/Ones x Ones

\*\*Cross out <sub>1</sub>  
after use

	1	3	4
x			3
	4	0	2
**	/	/	

## Key vocabulary

*Groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative, sets of, equal groups, times as big as, once, twice, three times, partition, grid method, multiple, product, tens, ones, value, inverse.*

## Multiplication - Stage 5

*Multiply numbers up to 4 digits by a one or two-digit number using a formal written method, including long multiplication for two-digit numbers.*

### Short column multiplication

#### 1. Thousands/Hundreds/Tens/Ones x Ones (THHTO x O)

\*\*Cross out 1 after use

	1	6	5	2
x				3
<hr/>				
	4	9	5	6
	<del>1</del>	<del>1</del>		

### Long column multiplication

#### 2. TO x TO

		4	5
x		3	2
<hr/>			
		9	0
1	3	<del>1</del>	0
<hr/>			
1	<del>1</del>	4	0
	<del>1</del>		

#### 3. THHTO x TO

	2	4	4	5
x			3	2
<hr/>				
	4	8	9	0
7	3	3	<del>1</del>	0
<hr/>				
7	<del>1</del>	<del>1</del>	2	4
	<del>1</del>	<del>1</del>		

#### 4. HTO x TO

		4	4	5
x			3	2
<hr/>				
		8	9	0
1	3	3	<del>1</del>	0
<hr/>				
1	<del>1</del>	<del>1</del>	2	4
	<del>1</del>	<del>1</del>		

## Key vocabulary

*Groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative, sets of, equal groups, times as big as, once, twice, three times, partition, grid method, multiple, product, tens, ones, value, value, inverse, square, factor, integer, decimal, short/long multiplication, carry, tenths, hundredths.*

## Multiplication - Stage 6

*Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication as in stage 5. Multiply decimals with up to 3 decimal places.*

### 1. Multiplying an integer by a decimal

1	3	.	8	5	x	5	
	1	3	8	5			
x				5			
	6	9	2	5			
1	3	.	8	5	x	5	2d.p
	6	9	.	2	5		

\*\*Cross out 1 after use

1. Take decimal points out
2. Multiply
3. Count total decimal places from original numbers
4. Add decimal point back in

### 2. Decimal by a decimal

	3	.	2	4	x	3	.	8	
			3	2	4				
					3	8			
	2	5	9	2					
	9	7	2	0					
	1	2	3	1	2				
3	.	2	4	x	3	.	8	3d.p	
	1	2	.	3	1	2			

### 3. Relationship of decimal point

$$324 \times 38.6 = 12506.4 \quad (1 \text{ decimal place})$$

$$32.4 \times 38.6 = 1250.64 \quad (2 \text{ decimal places})$$

$$3.24 \times 38.6 = 125.064 \quad (3 \text{ decimal places})$$

## Key vocabulary

*Groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative, sets of, equal groups, times as big as, once, twice, three times, partition, grid method, multiple, product, tens, ones, value, value, inverse, square, factor, integer, decimal, short/long multiplication, carry, tenths, hundredths.*