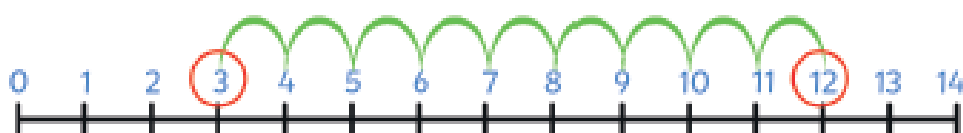


Addition

Number Line

$$3 + 9$$



Draw a number line. Start at 3 and hop 9 hops to find the answer.

$$3 + 9 = 12$$

$$23 + 14$$



Draw a number line. Start at 23, partition 14 into tens and ones.
Do one hop of 10 and then 4 hops of 1 to reach the answer.

$$23 + 14 = 37$$

Partitioning

$$54 + 32 =$$

- Partition the tens and ones.
- Add the tens.
- Add the ones.
- Combine the totals.

$$30 + 30 = 80$$

$$4 + 2 = 6$$

$$80 + 6 = 86$$

Addition: Column Method

1

$$\begin{array}{r} 453 \\ +348 \\ \hline \\ \hline \end{array}$$

Place the numbers one on top of the other, lining up the hundreds, tens and ones.

2

$$\begin{array}{r} 453 \\ +348 \\ \hline 1 \\ \hline \end{array}$$

Add the ones and write the answer

3

$$\begin{array}{r} 453 \\ +348 \\ \hline 1 \\ \hline 1 \end{array}$$

Regroup any tens under the tens column.

4

$$\begin{array}{r} 453 \\ +348 \\ \hline 01 \\ \hline 11 \end{array}$$

Add the tens including any tens you have regrouped. Regroup any hundreds under the hundreds column.

5

$$\begin{array}{r} 453 \\ +348 \\ \hline 801 \\ \hline 11 \end{array}$$

Add the hundreds including any hundreds you have regrouped.

6

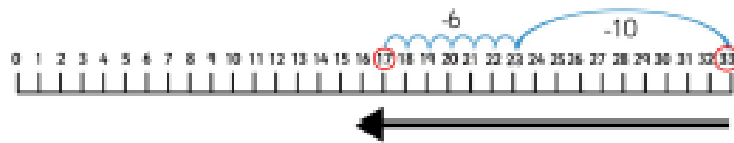
$$\begin{array}{r} 453 \\ +348 \\ \hline 801 \\ \hline 11 \end{array}$$

Check your answer.

Subtraction

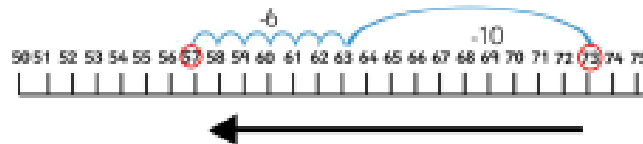
Counting Back

$$33 - 16 =$$



This is a good way to subtract when the numbers are far apart.

$$73 - 16 =$$



Partitioning

$$72 - 39$$

Always start with the biggest number.

$$72 - 30 = 42$$

Partition the smaller number and take away the tens.

$$42 - 9 = 33$$

Take away the ones from this new number.

Column Method

Line up the tens and ones with the big number on top.

Subtract the ones column.

Subtract the tens column.

Answer underneath.

| tens | ones |
|-------|------|
| 7 | 7 |
| 4 | 2 |
| <hr/> | |
| 3 | 5 |
| <hr/> | |

Column Method

Line up the tens and ones with the big number on top.

Subtract the ones.

If the bottom number in the ones column is bigger than the top then adjust from the tens before you subtract.

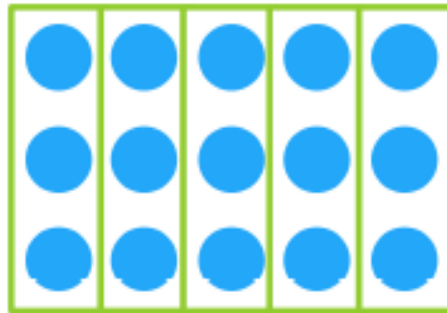
Subtract the tens

| tens | ones |
|--------------------------------|------|
| 2 ¹ 3 | 3 |
| 1 | 6 |
| <hr/> | |
| 20 | 13 |
| 10 | 6 |
| <hr/> | |
| 1 | 7 |
| <hr/> | |

Multiplication

Array

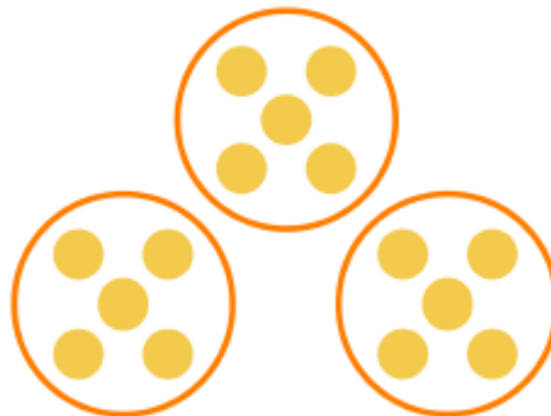
Rows and columns
with an equal amount in each.



$$5 \times 3 = 15$$

Equal Groups

Use the same number
of ones in each group.



$$3 \times 5 = 15$$

Repeated Addition

$$5 + 5 + 5 = 15$$

$$3 \times 5 = 15$$

Number Line

Starting from zero, hop 5 at a time.
Where do you land?



1 hop of 5 = 5
2 hops of 5 = 10
3 hops of 5 = 15

$$3 \times 5 = 15$$

Grid Method

| | | |
|----|----|---|
| x | 50 | 2 |
| 30 | | |
| 8 | | |

Draw a grid.

Write the partitioned numbers at the top and left of the grid.

| | | |
|----|------|----|
| x | 50 | 2 |
| 30 | 1500 | 60 |
| 8 | 400 | 16 |

Multiply the partitioned numbers.

$$\begin{array}{r}
 1500 \\
 + 400 \\
 + 60 \\
 + 16 \\
 \hline
 1976
 \end{array}$$

Add the products.

$$52 \times 38 = 1976$$

Column Method

3-digit x 2-digit carrying not shown

$$\begin{array}{r}
 368 \\
 \times 24 \\
 \hline
 \end{array}$$

Write the numbers above each other in columns.

$$\begin{array}{r}
 368 \\
 \times 24 \\
 \hline
 1472
 \end{array}$$

Multiply 368 x 4

$$\begin{array}{r}
 368 \\
 \times 24 \\
 \hline
 1472 \\
 7360 \\
 \hline
 \end{array}$$

Multiply 368 x 20

$$\begin{array}{r}
 1472 \\
 + 7360 \\
 \hline
 8832
 \end{array}$$

Add the products.

$$368 \times 24 = 8832$$

Multiplying by 10

Use place value to work out how to multiply by 10.

$$674 \times 10 = ?$$

If you multiply a number by 10, the digits move one place value to the left.

| Thousands | Hundreds | Tens | Ones |
|-----------|----------|------|------|
| | 6 | 7 | 4 |
| Thousands | Hundreds | Tens | Ones |
| 6 | 7 | 4 | 0 |

Zeros will be added after the digits have moved.

$$674 \times 10 = 6740$$

Use place value to work out how to multiply by 100.

$$674 \times 100 = ?$$

| Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---------------|-----------|----------|------|------|
| | | 6 | 7 | 4 |
| Ten Thousands | Thousands | Hundreds | Tens | Ones |
| 6 | 7 | 4 | 0 | 0 |

Zeros will be added after the digits have moved.

$$674 \times 100 = 67\,400$$

Multiplying Decimals by 10

Use place value to work out how to multiply by 10.

$$6.74 \times 10 = ?$$

If you multiply a number by 10, the digits move one place value to the left.

| Hundreds | Tens | Ones | Tenths | Hundredths |
|----------|------|------|--------|------------|
| | | 6 | 7 | 4 |
| Hundreds | Tens | Ones | Tenths | Hundredths |
| | 6 | 7 | 4 | |

$$6.74 \times 10 = 67.4$$

Use place value to work out how to multiply by 100.

$$6.74 \times 100 = ?$$

| Hundreds | Tens | Ones | Tenths | Hundredths |
|----------|------|------|--------|------------|
| | | 6 | 7 | 4 |
| Hundreds | Tens | Ones | Tenths | Hundredths |
| 6 | 7 | 4 | | |

If you multiply a number by 100, the digits move two places to the left.

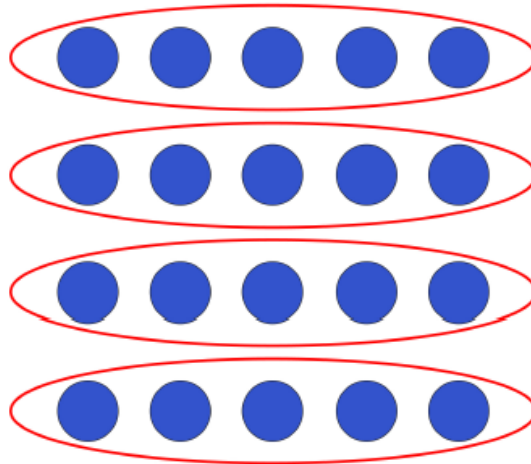
$$6.74 \times 100 = 674$$

Division

Grouping

$$20 \div 5 = 4$$

20 divided by 5 gives 4 groups.



Grouping using arrays.

Repeated Subtraction

You can use repeated subtraction to see how many times a smaller number goes into a bigger one.

$$15 \div 3 = ?$$



The number of times you can take 3 from 15 is 5.

$$15 - 3 - 3 - 3 - 3 - 3 = 0$$

$$15 \div 3 = 5$$

Partitioning

$$84 \div 4$$

$$80 \div 4 = 20$$

$$4 \div 4 = 1$$

$$\underline{\quad\quad}$$

$$21$$

$$\underline{\quad\quad}$$

Partition the number into **tens and ones.**

Divide the **tens and ones.**

Combine your **totals.**

$$84 \div 4 = 21$$

Short Division

two digit numbers

$$84 \div 6 = ?$$

Partition 84 into tens and ones.

Work out how many 6s divide into 80 so that the answer is a multiple of 10.

In this case the highest multiple of 10 divisible by 6 is 60.

Partition 84 into 60 and 24 then divide each number by six.

Combine your totals.

$$\begin{array}{r} 10 + 4 = 14 \\ 6 \overline{) 60 + 24} \end{array}$$

This method can be shortened to:

$$\begin{array}{r} 14 \\ 6 \overline{) 84} \end{array}$$

Long Division

$$399 \div 15 = ?$$

$$\begin{array}{r}
 26 \frac{3}{5} \\
 \hline
 15 \overline{) 399} \\
 \underline{300} \\
 99 \\
 \underline{90} \\
 r9 \\
 \frac{9}{15} = \frac{3}{5}
 \end{array}$$

First partition the number.

Divide 300 by 15. Write this on the answer line above the correct units.

Divide 99 by 15.

Write any remainders as a fraction as simplified as possible.