

## What do I need to be able to do?

By the end of this unit you should be able to:

- Understand and use factors
- Understand and use multiples
- Multiply/ Divide integers and decimals by powers of 10
- Use formal methods to multiply
- Use formal methods to divide
- Understand and use order of operations
- Solve area problems
- Solve problems using the mean

## Keywords

- Array:** an arrangement of items to represent concepts in rows or columns  
**Multiples:** found by multiplying any number by positive integers  
**Factor:** integers that multiply together to get another number.  
**Milli:** prefix meaning one thousandth  
**Centi:** prefix meaning one hundredth  
**Kilo:** prefix meaning multiply by 1000  
**Quotient:** the result of a division  
**Dividend:** the number being divided  
**Divisor:** the number we divide by

## Factors

●●●●● Arrays can help represent factors ●●●●●  
 ●●●●● Factors of 10 10 x 1 or 1 x 10  
 5 x 2 or 2 x 5 1, 2, 5, 10

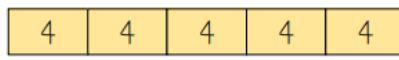
The number itself is always a factor

Square numbers have an ODD number of factors

Factors of 4 1, 2, 4      Factors of 36 1, 2, 3, 4, 6, 9, 12, 18, 36

Be strategic - Lay factors out in pairs can help you not to miss any

## Multiples



Bar models can represent by something is a multiple. Eg 20 is a multiple of 4

### Lowest Common Multiples

LCM of 9 and 12      The first time their multiples match      LCM = 36

9: 9, 18, 27, 36, 45, 54  
 12: 12, 24, 36, 48, 60

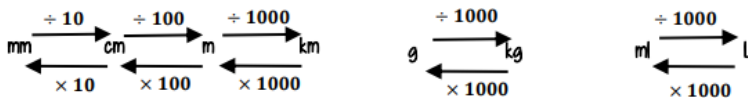
## Multiply/ Divide by powers of 10

3 x 100 = 300  
 0.03 x 100 = 3

Repeated multiplication and division by powers of 10 is commutative  
 ÷ 10 then ÷ 10 → ÷ 100

## Metric conversions

Useful Conversions



## Multiplication methods

Long multiplication (column)

|       |   |   |
|-------|---|---|
| H     | T | O |
| 1     | 8 | 7 |
| x     | 9 |   |
| ----- |   |   |
|       |   |   |
|       |   |   |
|       |   |   |

Grid method

|       |     |    |   |
|-------|-----|----|---|
| x     | 100 | 80 | 7 |
| 9     |     |    |   |
| ----- |     |    |   |
|       |     |    |   |
|       |     |    |   |
|       |     |    |   |

Less effective method especially for bigger multiplication

**Multiplication with decimals**  
 Perform multiplications as integers  
 eg 0.2 x 0.3 → 2 x 3

Make adjustments to your answer to match the question: 0.2 x 10 = 2  
 0.3 x 10 = 3  
 Therefore 6 ÷ 100 = 0.06

Estimations: Using estimations allows a 'check' if your answer is reasonable

## Division methods

Short division: 3584 ÷ 7 = 512

Complex division: 24 ÷ 6 = 4

Break up the divisor using factors

**Division with decimals**  
 The placeholder in division methods is essential - the decimal lines up on the dividend and the quotient  
 24 ÷ 0.02 → 24 ÷ 0.2 → 240 ÷ 2

All give the same solution as represent the same proportion  
 Multiply the values in proportion until the divisor becomes an integer

## Order of operations

If you have multiple operations from the same tier work from left to right

eg 10 - 3 + 5 → 10 - 3 → 7 + 5

6 x 4 + 8 x 2 = 40  
 24 + 16 = 40

## Area problems

Rectangle: Base x Perpendicular height

Parallelogram/ Rhombus: Base x Perpendicular height

Triangle: 1/2 x Base x Perpendicular height

A triangle is half the size of the rectangle it would fit in

## Mean problems

Mean - a measure of average. It gives an idea of the central value.

Lilly, Annie and Ezra have the following cubes

Lilly: 8 cubes, Annie: 8 cubes, Ezra: 8 cubes. Total: 24 cubes.

Finding the mean amount is the average amount each person would have if shared out equally

The mean number of blocks would be 8 each