

Winton's Mathematical Methods and Calculation Policy

Year 5 and 6



Addition +

Vocabulary

add
addend
total
increase
more
plus
make
sum
altogether
estimate
number bonds

256 + 313 =

H	T	O
200	50	6
300	10	3
500 60 9 = 569		

353 + 268 = 621

H	T	O
300	50	3
200	60	8
100	10	
600	20	1 = 621

2. Expanded Partitioning Column

1. Partitioning

32 + 26 = 58

T: 30 + 20 = 50

U: 2 + 6 = 8

32 + 26 = 58

30 + 20 = 50

2 + 6 = 8

3. Expanded Column

252 + 476 = 728

100 from 50 + 70 = 120

H	T	O
2	5	2
4	7	6
(2+6) ones		
1	2	0
(50+70) Tens		
6	0	0
(200+400) Hundreds		
7	2	8

5. Column: Decimals

2.31 + 3.8

2.31	
3.80	← add a place holder
6.11	

4. Compact column

252 + 476 = 728

Regrouped numbers

2	5	2
4	7	6
7	2	8
1	1	1
1	4	3

Subtraction

Vocabulary

subtract
subtraction
total
decrease
less
minus
amount
estimate
difference
number bonds

2. Expanded Partitioning Column

1 5 6 - 2 7 = 1 2 9

100 - 20 = 80
50 - 7 = 43
6 - 0 = 6

80 + 43 + 6 = 129

1. Partitioning

45 - 13 = 32

45 (40, 5) - 13 (10, 3) = 32 (30, 2)

3. Expanded Column

156 - 27 = 129

156 - 7 = 149 (ones)
149 - 20 = 129 (tens)
129 - 0 = 129 (hundreds)

5. Column: Decimals

6.11 - 3.8 = 2.31

add a place holder

4. Compact column

89137 - 452 = 88685

Multiplication \times

x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	100	50	25
3											30				300	150	75

Vocabulary

multiply
 multiplier
 multiplicand
 product
 lots of
 inverse
 derive
 factors
 common factors
 multiples
 common multiples
 composite numbers
 prime numbers
 prime factors
 square numbers
 cubed numbers
 convert

2. Expanded Column

$$\begin{array}{r} 40 \\ \times 2 \\ \hline 80 \\ 160 \\ \hline 168 \end{array}$$

$$\begin{array}{r} 36 \times 15 \\ \hline 180 \quad (5 \times 6) \\ 360 \quad (5 \times 30) \\ \hline 540 \end{array}$$

1. Grid Method

$$\begin{array}{r} 3.2 \times 24 = 76.8 \\ \hline \begin{array}{r} 320 \\ 640 \\ \hline 768 \end{array} \end{array}$$



$$\begin{array}{r} 40 \\ \times 2 \\ \hline 80 \end{array}$$

4. Short column: Decimals

$$\begin{array}{r} 3.9 \times 30 \\ \hline 1170 \end{array}$$

Use adjustment strategy

3. Short column

$$\begin{array}{r} 362 \times 15 \\ \hline 1810 \\ 3620 \\ \hline 5430 \end{array}$$

$$\begin{array}{r} 367 \times 4 \\ \hline 1468 \end{array}$$

'Be a hero, add a 0'

Division \div

Vocabulary

divisor
dividend
quotient
share
equal
groups of
inverse
derive
factors
common factors
multiples
prime factors
common multiples
composite numbers
prime numbers
convert

2. Short (Bus Stop) with remainders

$$823 \div 4 = 205 \text{ r}3$$

$$4 \overline{) 823}$$

$$205 \text{ r}3$$

Using known facts

$$27 \div 4 = 6 \text{ R}3$$

Divisor: 4, Quotient: 6, Dividend: 27, Remainder: 3

$$205.75 \div 4 = 51.4375$$

Formal with decimal point and place holders

1. Short (Bus Stop)

$$179 \div 5 = 35 \text{ r}4$$

$$8 \div 5 = 1 \text{ r}3$$

$$39 \div 5 = 7 \text{ r}4$$

$$45 \div 5 = 9$$

3. Short (Bus Stop): 2 digit divisors

$$3850 \div 25 = 154$$

$$900 \div 25 = 36$$

$$25 \overline{) 900}$$

$$25 \overline{) 3850}$$

4. Short (Bus Stop): Decimals

$$12.9 \div 3 = 4.3$$

$$3 \overline{) 12.9}$$

& use of adjustment strategy

$$12.9 \div 3 = 4.3$$

$$3 \overline{) 12.9}$$

Fractions +

Vocabulary

numerator
 denominator
 unit fraction
 non-unit fraction
 equivalence
 equivalent
 proper fractions
 improper fractions
 mixed numbers
 simplify
 tenths
 hundredths
 percentage
 ratio
 proportion
 number of parts

2. Different denominators - finding common multiples (change one)

$$\frac{1}{5} + \frac{2}{10} = \frac{2}{5}$$

$$\frac{2}{10} + \frac{2}{10} = \frac{4}{10} = \frac{2}{5}$$

Diagram showing the process of finding a common denominator for $\frac{1}{5} + \frac{2}{10}$. The first fraction is multiplied by 2 to get $\frac{2}{10}$, and the second fraction is multiplied by 2 to get $\frac{4}{10}$. The sum is $\frac{4}{10}$, which simplifies to $\frac{2}{5}$.

4. Mixed numbers

$$1\frac{2}{4} + 3\frac{1}{8} = 4\frac{5}{8}$$

$$1 + 3 = 4$$

$$\frac{2}{4} + \frac{1}{8} = \frac{4}{8} + \frac{1}{8} = \frac{5}{8}$$

$$4 + \frac{5}{8} = 4\frac{5}{8}$$

Diagram showing the process of adding mixed numbers $1\frac{2}{4} + 3\frac{1}{8}$. The whole numbers are added first: $1 + 3 = 4$. Then the fractions are added: $\frac{2}{4} + \frac{1}{8} = \frac{4}{8} + \frac{1}{8} = \frac{5}{8}$. The final result is $4\frac{5}{8}$.

1. Common (same) denominator

$$\frac{1}{5} + \frac{2}{5} = \frac{3}{5}$$

Diagram showing the process of adding fractions with a common denominator. The fractions $\frac{1}{5} + \frac{2}{5}$ are added to get $\frac{3}{5}$. Below the equation, a bar model shows a bar divided into 5 equal parts, with 1 part shaded red and 2 parts shaded blue, totaling 3 parts shaded.

3. Different denominators - finding common multiples (change both)

$$\frac{3}{6} + \frac{5}{9} = 1\frac{1}{18}$$

$$\frac{9}{18} + \frac{10}{18} = \frac{19}{18} = 1\frac{1}{18}$$

Diagram showing the process of finding a common denominator for $\frac{3}{6} + \frac{5}{9}$. The first fraction is multiplied by 3 to get $\frac{9}{18}$, and the second fraction is multiplied by 2 to get $\frac{10}{18}$. The sum is $\frac{19}{18}$, which simplifies to $1\frac{1}{18}$.

Fractions

Vocabulary

numerator
 denominator
 unit fraction
 non-unit fraction
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 mixed numbers
 simplify
 tenths
 hundredths
 percentage
 ratio
 proportion
 number of parts

2. Different denominators - finding common multiples (change one)

$$\frac{2}{5} - \frac{1}{10} = \frac{3}{10}$$

$$\frac{4}{10} - \frac{1}{10} = \frac{3}{10}$$

Diagram showing the conversion of $\frac{2}{5}$ to $\frac{4}{10}$ by multiplying both numerator and denominator by 2.

4. Mixed numbers

$$1\frac{2}{6} - \frac{3}{6} =$$

$$\left(\frac{6}{6} + \frac{2}{6}\right) \downarrow \frac{8}{6} - \frac{3}{6} = \frac{5}{6}$$

Diagram showing the conversion of $1\frac{2}{6}$ to $\frac{8}{6}$ by adding $\frac{6}{6}$ to the whole number part.

1. Common (same) denominator

$$\frac{4}{5} - \frac{2}{5} = \frac{2}{5}$$

Diagram showing a bar model with 5 equal parts. The first 4 parts are shaded red, and the next 2 parts are shaded green. The result is 2 parts shaded green.

3. Different denominators - finding common multiples (change both)

$$\frac{5}{9} - \frac{3}{6} = \frac{1}{18}$$

$$\frac{10}{18} - \frac{9}{18} = \frac{1}{18}$$

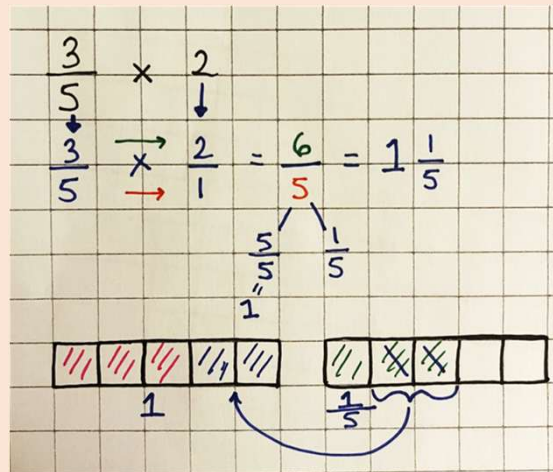
Diagram showing the conversion of $\frac{5}{9}$ to $\frac{10}{18}$ by multiplying both numerator and denominator by 2, and $\frac{3}{6}$ to $\frac{9}{18}$ by multiplying both numerator and denominator by 3.

Fractions **X**

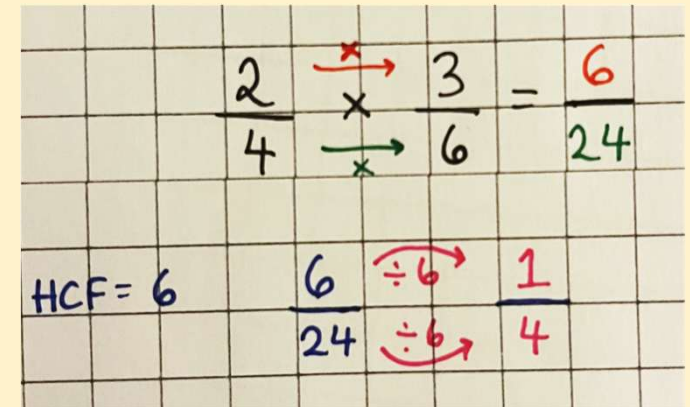
Vocabulary

numerator
 denominator
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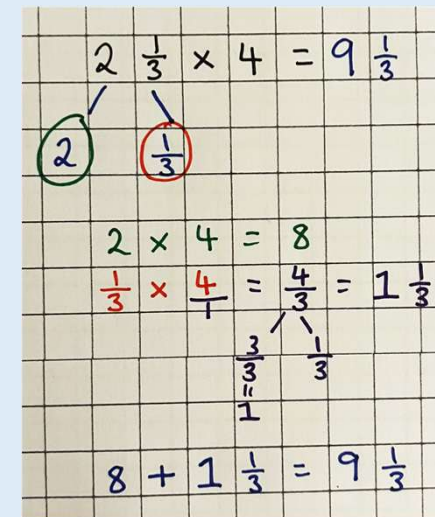
2. Multiplying fractions by whole numbers



1. Multiplying fractions



3. Multiplying mixed numbers by whole numbers



Fractions \div

Vocabulary

numerator
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 unit fraction
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2. Dividing fractions by whole numbers

$$\frac{1}{3} \div 2 = \frac{1}{3} \div \frac{2}{1} = \frac{1}{6}$$

$$\frac{1}{3} \times \frac{1}{2} = \frac{1}{6}$$

1. Keep

2. Change

3. Flip

1. Dividing fractions by fractions

$$\frac{2}{5} \div \frac{2}{3} = \frac{6}{10} = \frac{3}{5}$$

$$\frac{2}{5} \times \frac{3}{2} = \frac{6}{10}$$

Simplifying answers if possible

$$\frac{6}{10} \div \frac{2}{2} = \frac{3}{5}$$

3. Dividing fractions by whole numbers and simplifying the answer

$$4 \div \frac{2}{3} = \frac{4}{1} \div \frac{2}{3} = \frac{12}{2} = 6$$

Answers that can be converted to a whole number, must be converted.

Number Facts

$$8 \times 10 = 80$$

$$80 \times 10 = 800$$

$$8 \times 100 = 800$$

	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
$\times 100$	100	200	300	400	500	600	700	800	900
	10	20	30	40	50	60	70	80	90
	1	2	3	4	5	6	7	8	9

$\times 10$
 $\times 10$

$$8 \times 10 \times 10 = 8 \times 100$$

$$1,200 \div 10 = 120$$

$$120 \div 10 = 12$$

$$1,200 \div 100 = 12$$

	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
$\div 100$	100	200	300	400	500	600	700	800	900
	10	20	30	40	50	60	70	80	90
	1	2	3	4	5	6	7	8	9

$\div 10$
 $\div 10$

Multiplying and Dividing by 10, 100 and 1000

10 000	1000	100	10	1	●	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
					●			

Multiplying

X 10
X 100
X 1000

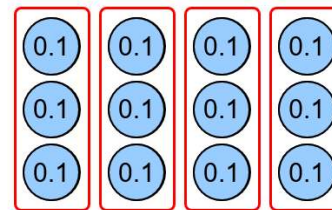
digits move LEFT 1 space
digits move LEFT 2 spaces
digits move LEFT 3 spaces



Dividing

$\div 10$
 $\div 100$
 $\div 1000$

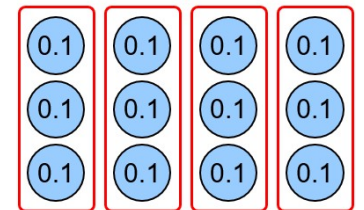
digits move RIGHT 1 space
digits move RIGHT 2 spaces
digits move RIGHT 3 spaces



$$4 \times 3 = 12$$

$$4 \times 3 \text{ tenths} = 12 \text{ tenths}$$

$$4 \times 0.3 = 1.2$$



$$12 \div 4 = 3$$

$$12 \text{ tenths} \div 4 = 3 \text{ tenths}$$

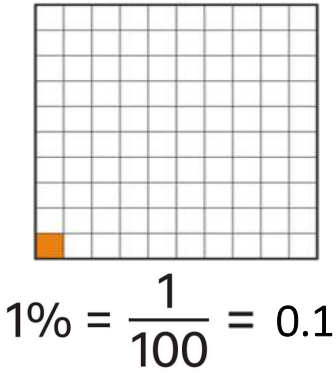
$$1.2 \div 4 = 0.3$$

Number Facts

100				
50		50		
25	25	25	25	
20	20	20	20	20

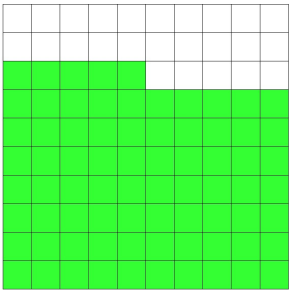
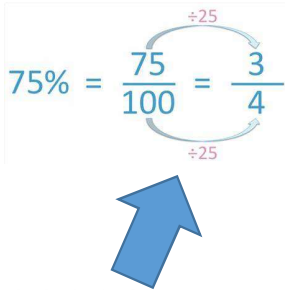
10,000				
5,000		5,000		
2,500	2,500	2,500	2,500	
2,000	2,000	2,000	2,000	2,000

1				
0.5		0.5		
0.25	0.25	0.25	0.25	
0.20	0.20	0.20	0.20	0.20

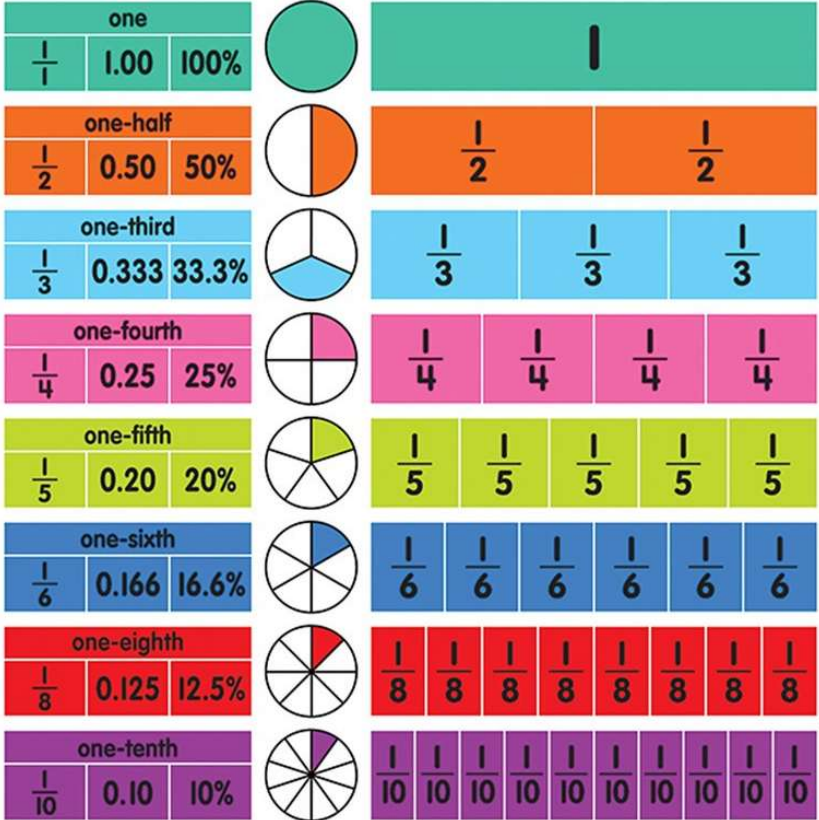


x 100

÷ 100



$75\% = \frac{75}{100} = 0.75$



18		
6	6	6

$6 \times 3 = 18$

$3 \times 6 = 18$

18					
3	3	3	3	3	3

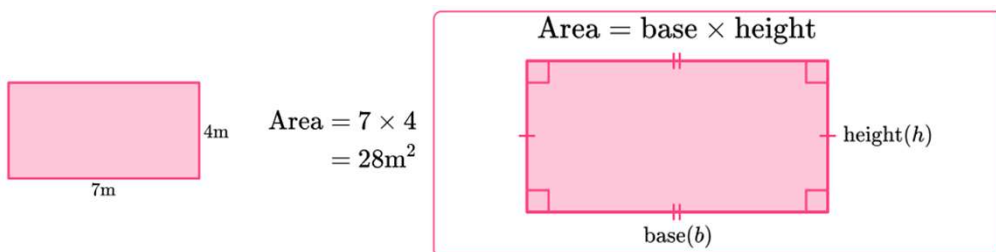
$18 \div 6 = 3$

$18 \div 3 = 6$

$\frac{1}{6}$ of 18 = 3

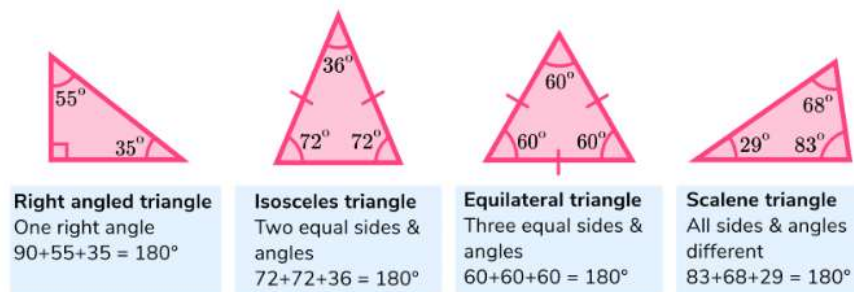
$\frac{1}{3}$ of 18 = 6

The **area of a rectangle** is the amount of space inside the rectangle.



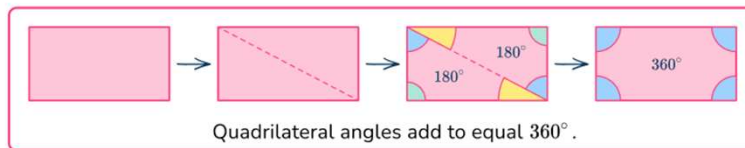
Angles in a triangle refers to the sum (total) of the angles at each vertex in a triangle. The sum of the interior angles of a triangle is **180°**.

E.g.

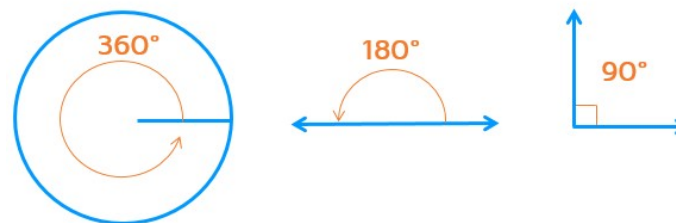
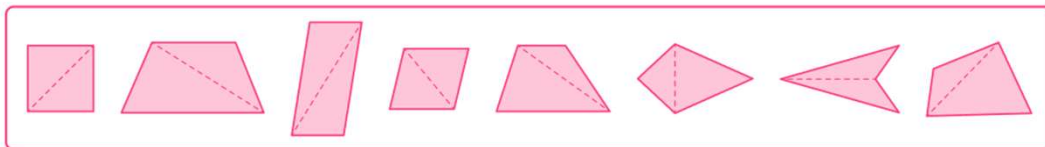


Quadrilateral angles are the four angles that occur at each **vertex** within a four-sided shape; these angles are called **interior angles of a quadrilateral**.

The sum of the interior angles of a quadrilateral is **360°**.
You can prove this using the angle sum of a triangle.

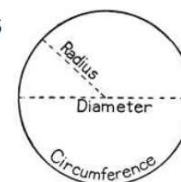


This is the same for all types of quadrilaterals:



Diameter = $2 \times$ radius

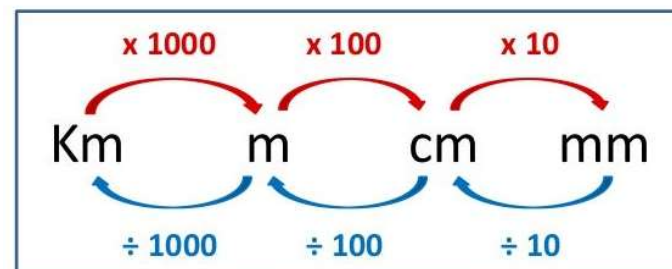
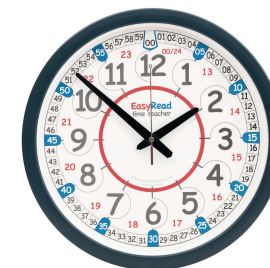
Radius = $\frac{1}{2}$ diameter



$$360 \div 2 = 180$$

$$\frac{1}{2} \text{ of } 360 = 180$$

1 day = 24 hours
1 hour = 60 minutes
1 minute = 60 seconds



5km = ? m **Need to $\times 1000$**
120cm = ? m **Need to $\div 100$**

$5 \times 1000 = 5000\text{m}$ ✓
 $120 \div 100 = 1.2\text{m}$ ✓

1cm = 10mm
1m = 100cm
1km = 1000m
1kg = 1000g
1l = 1000ml

