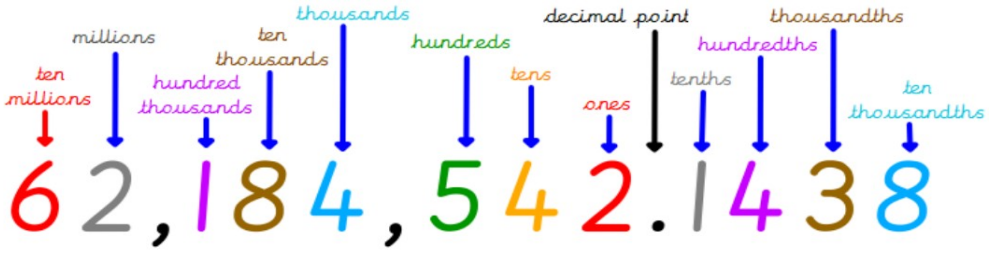
# The Redeemer C. of E. Primary School

# Year 6 Mathematics Core Knowledge Organiser

## Place Value




## Decimals

## Vocabulary

| Term | Definition |
|---|---|
| factor | a number that divides exactly into another number |
| common factor | factors of two numbers that are the same |
| prime number | a number with only 2 factors: 1 and itself |
| composite number | a number with more than two factors |
| prime factor | a factor that is prime |
| multiple | a number in another number's times table |
| common multiple | multiples of two numbers that are the same |
| square numbers | the result when a number has been multiplied by itself |
| cube numbers | the result when a number has been multiplied by itself 3 times |

## Measure Conversions

| | |
|---|---|
| 1 **centi**metre | 10mm |
| 1 metre | 100cm |
| 1 **kilo**metre | 1,000 m |
| | |
| 1 mile | 1.6 km |
| 1 kilometre | 0.625 ($^5/_8$) mile |
| | |
| 1 **kilo**gram | 1,000 grams |
| | |
| 1 litre | 1,000 **milli**litres |

## BIDMAS

| | |
|---|---|
| **Brackets** | 10 × (4 + 2) = 10 × 6 = 60 |
| **Indices** | 5 + $2^2$ = 5 + 4 = 9 |
| **Division** | 10 + 6 ÷ 2 = 10 + 3 = 13 |
| **Multiplication** | 10 - 4 × 2 = 10 - 8 = 2 |
| **Addition** | 10 × 4 + 7 = 40 + 7 = 47 |
| **Subtraction** | 10 ÷ 2 - 3 = 5 - 3 = 2 |

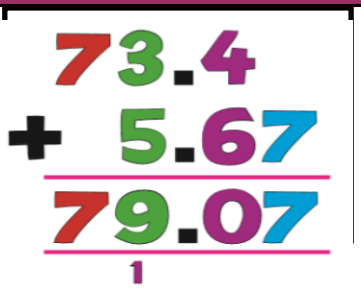
## Equivalent fractions, decimals and percentages


| | | | |
|---|---|---|---|
| $^1/_{100}$ | 0.01 | 1% | ÷ 100 |
| $^1/_{20}$ | 0.05 | 5% | ÷ 20 |
| $^1/_{10}$ | 0.1 | 10% | ÷ 10 |
| $^1/_5$ | 0.2 | 20% | ÷ 5 |
| ¼ | 0.25 | 25% | ÷ 4 |
| ½ | 0.5 | 50% | ÷ 2 |
| ¾ | 0.75 | 75% | ÷ 4, x3 |
| 1 | 1 | 100% | ÷ 1 |

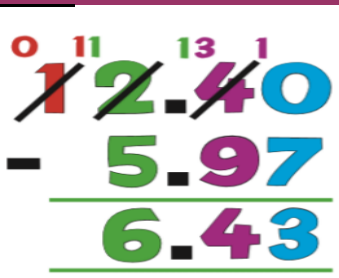
## Roman Numerals

| | | | |
|---|---|---|---|
| 1 | I | 100 | C |
| 5 | V | 500 | D |
| 10 | X | 1000 | M |
| 50 | L | | |

## Addition




## Subtraction




## Long Multiplication

| | | 4 | 3 | 5 | 7 | |
|---|---|---|---|---|---|---|
| | x | | | 3 | 6 | |
| | 2 | 6 | 1 | 4 | 2 | (4357 x 6) |
| 1 | 3 | 0 | 7 | 1 | 0 | (4357 x 30) |
| 1 | 5 | 6 | 8 | 5 | 2 | |

## Bus Stop Division

**short division**

| | | 0 | 5 | 2 | r3 |
|---|---|---|---|---|---|
| 1 | 2 | 6 | 2 | 7 | |
| | | 1 | | | |

decimal 52.25

fraction $52\frac{3}{12}$ / $52\frac{1}{4}$

## Long Division

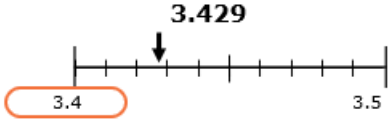
**long division**

| | | 0 | 5 | 2 | r3 | |
|---|---|---|---|---|---|---|
| 1 | 2 | 6 | 2 | 7 | | (12 x 50) |
| | - | 6 | 0 | 0 | | |
| | | | 2 | 7 | | (12 x 2) |
| | - | | 2 | 4 | | |
| | | | | 3 | | |

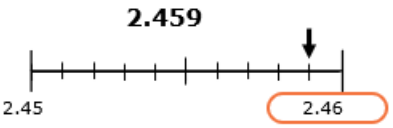
## Rounding

Round to the nearest whole number


Round to the nearest tenth




Round to the nearest hundredth




## Multiply and Divide

**multiplying by 10, 100 and 1000**

| M | HTh | TTh | Th | H | T | O | t | h | th |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1 | 2 | 4 | 5 | |
| | | | | 1 | 2 | 4 | 5 | | |
| | | | 1 | 2 | 4 | 5 | | | |
| | | 1 | 2 | 4 | 5 | 0 | | | |

**dividing by 10, 100 and 1000**

| M | HTh | TTh | Th | H | T | O | t | h | th |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 4 | 2 | 1 | | | |
| | | | | | 4 | 2 | 1 | | |
| | | | | | | 4 | 2 | 1 | |
| | | | | | | 0 | 4 | 2 | 1 |

# Fractions : whole from amounts

Add Subtract Multiply Divide

$\frac{1}{6}$ of 30 = 5

30

5 | | | | | |

?

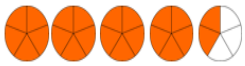
$\frac{1}{6}$ of ☐ = 30

180

30 | 30 | 30 | 30 | 30 | 30

30

**mixed numbers and improper fractions**



mixed number $4\frac{2}{5}$

improper fraction $\frac{22}{5}$

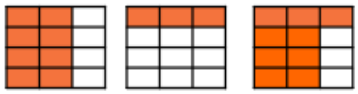
**expressing fractions in the same denominator**

$\frac{2}{3}$ $\frac{8}{12}$ $\frac{1}{4}$ $\frac{3}{12}$

**adding fractions with different denominators**

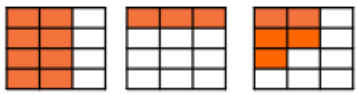
First express the fractions as the same denominator

$\frac{8}{12} + \frac{3}{12} = \frac{11}{12}$

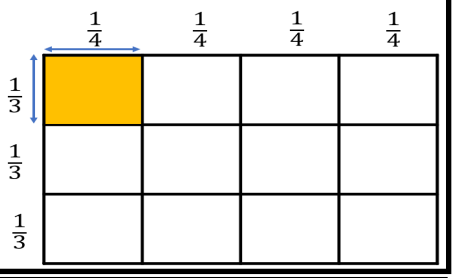


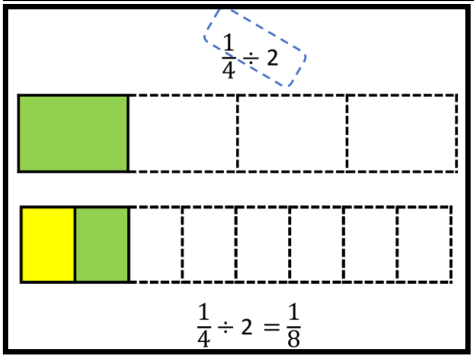
**subtracting fractions with different denominators**

$\frac{8}{12} - \frac{3}{12} = \frac{5}{12}$



$\frac{1}{4} \times \frac{1}{3} = \frac{1}{12}$



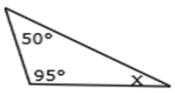

# Geometry

Angles 3D shapes

## Angles

| | |
|---|---|
| full turn | 360° |
| half turn | 180° |
| right angle | 90° |
| acute angle | < 90° |
| obtuse angle | > 90° |
| reflex angle | >180° |
| angles on a straight line | 180° |
| angles inside a triangle | 180° |
| angles inside a quadrilateral | 360° |

**angles in triangle**



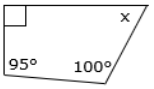

Angles in a triangle add up to 180°

95° + 50° + x = 180°

145° + x = 180°

x = 35°

**angles in a quadrilateral**




Angles in a quadrilateral add up to 360°

90° + 95° + 100° + x = 360°

285° + x = 360°

x = 75°

## 3D shapes

| |  square-based pyramid |  triangular-based pyramid |  triangular prism |
|---|---|---|---|
| **faces** (the flat sides) | 5 | 4 | 5 |
| **edges** | 8 | 6 | 9 |
| **vertices** (the points where the edges meet) | 5 | 4 | 6 |

**Volume** = the amount of space a 3D shape takes up, usually measured in $cm^3$ or $m^3$


**Volume of a cuboid** = length x width x height

# Measurement: Conversions

Perimeter/Area/Volume

Statistics: Average

**metric units of measure**

**length**

÷ 10 | 10 mm = 1 cm | x 10

÷ 100 | 100 cm = 1 m | x 100

÷ 1,000 | 1,000 m = 1 km | x 1,000

**mass**

÷ 1,000 | 1,000 g = 1 kg | x 1,000

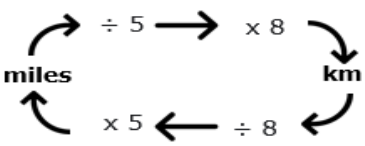
**capacity**

÷ 1,000 | 1,000 ml = 1 l | x 1,000

**convert between miles and kilometres**

1 mile ≈ 1.6 km

5 miles ≈ 8 km




**area and perimeter of rectangles**

Area = length x width

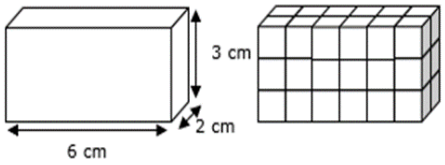
Perimeter = 2L + 2W


Area = 5 x 3 = 15 $cm^2$

Perimeter = (5 x 2) + (3 x 2) = 16 $cm^2$

**volume of cuboids**

width x length x height

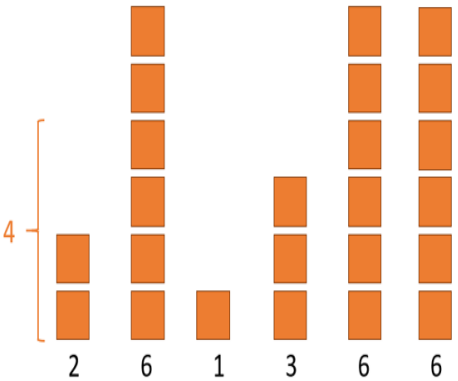



6 x 2 x 3 = 36 $cm^3$

2 6 1 3 6 6 = 24

Mean = 4

24 ÷ 6 = 4




Mean = Total ÷ number of items

The mean of this set of numbers is 4