

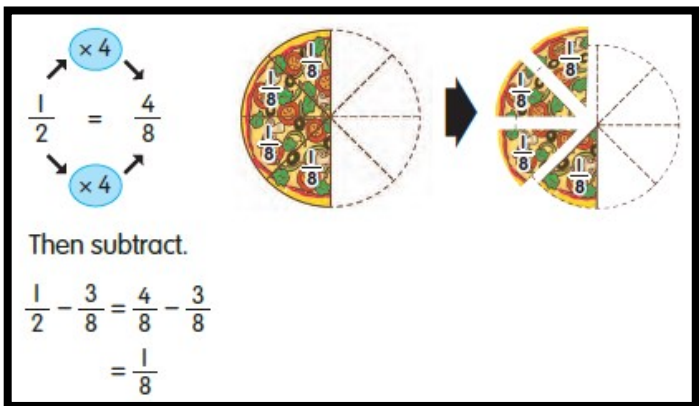
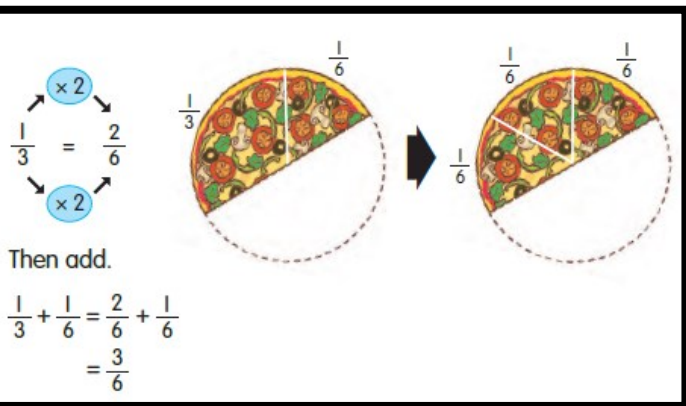
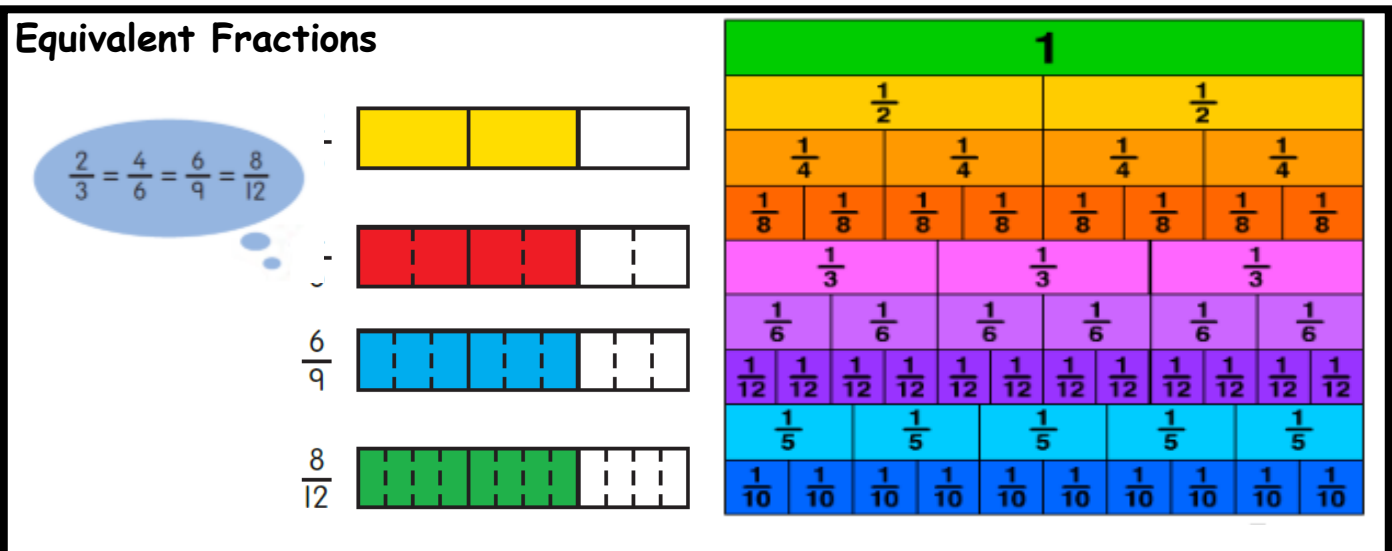
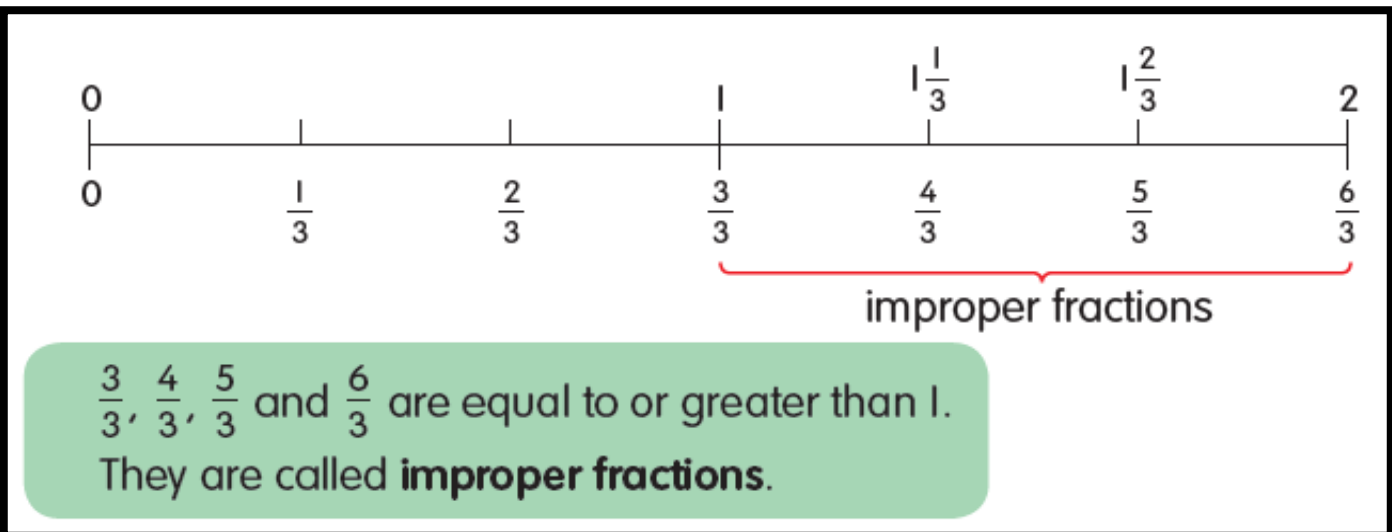
# MATHS SPRING 1 KNOWLEDGE ORGANISERS



# Year 5 Unit 6—Fractions



<p><b>Equivalence</b></p> <p>Having the same value</p> $\frac{1}{2} = \frac{2}{4} = \frac{8}{16}$ $1 \div 2 = 0.5 \quad 2 \div 4 = 0.5 \quad 8 \div 16 = 0.5$	<p><b>Improper Fraction</b></p> <p>A fraction greater than one whole</p> $\frac{8}{5}$
<p><b>Proper Fraction</b></p> <p>A fraction smaller than one whole</p> $\frac{2}{3}$ $\frac{3}{10}$	<p><b>Mixed Number</b></p> <p>Written as a whole number and a proper fraction</p> $1\frac{3}{4} \frac{7}{4}$



# Year 6 Unit 6

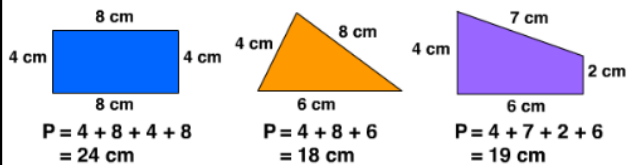
## Area, Perimeter and Volume



### perimeter

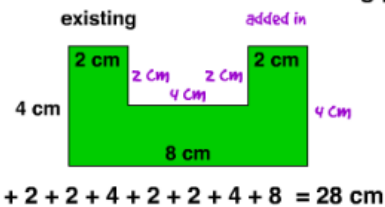
The perimeter of a shape is the sum of the length of all its sides.

#### adding the length of sides



### completing missing lengths

Some lengths may not be shown on examples. Don't forget to add them in when calculating perimeter.

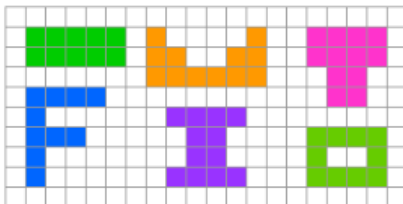


### area

Area can be determined using a grid or a formula.

#### Using a grid

The squares are counted to find an area.

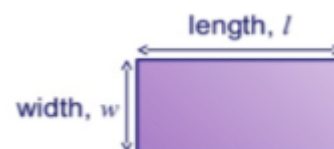


Area is measured in **square units**

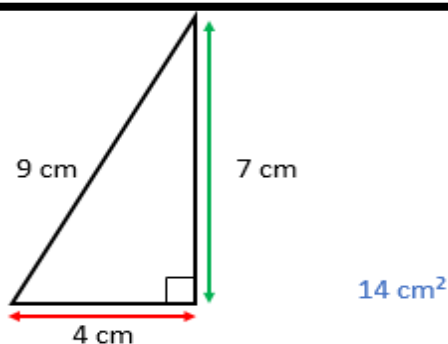
For example, we use  $\text{mm}^2$ ,  $\text{cm}^2$  or  $\text{m}^2$

The <sup>2</sup> tells us that there are 2 dimensions, length and width.

We can find the area of a rectangle by multiplying the **length** and the **width** of the rectangle together.



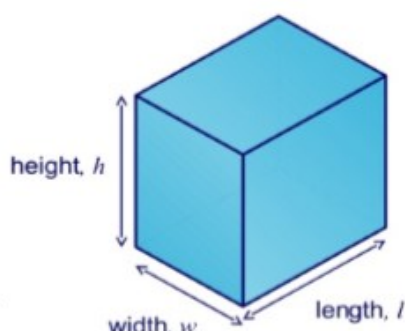
$$\begin{aligned} \text{Area of a rectangle} \\ &= \text{length} \times \text{width} \\ &= lw \end{aligned}$$



$$\text{Area of a triangle} = \frac{\text{Base} \times \text{Perpendicular height}}{2}$$

$$\begin{aligned} \text{Area of a triangle} &= \frac{1}{2} \times \text{Base} \times \text{Perpendicular height} \\ &= \frac{1}{2} \times 4 \times 7 \end{aligned}$$

We can find the volume of a cuboid by multiplying the area of the base by the height.



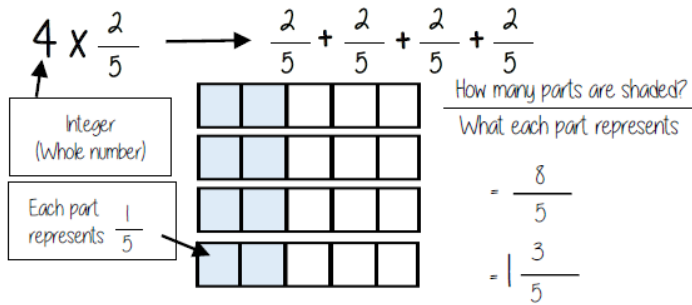
$$\begin{aligned} \text{Volume of a cuboid} \\ &= \text{length} \times \text{width} \times \text{height} \\ &= lwh \end{aligned}$$

# Year 6 Unit 7

## Fractions B



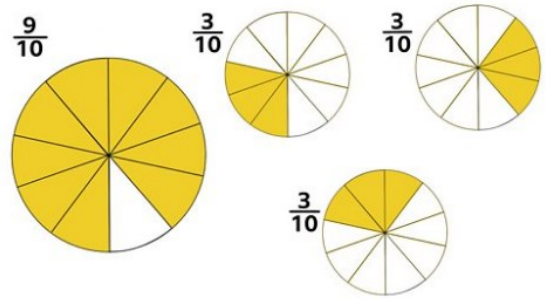
### Multiplying by an integer=repeated addition



### Dividing a fraction by an integer

There is  $\frac{9}{10}$  of a pizza left and we need to share it equally between 3 people.

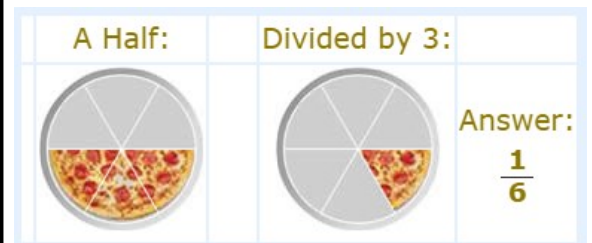
As a fraction, how much pizza will each person receive?



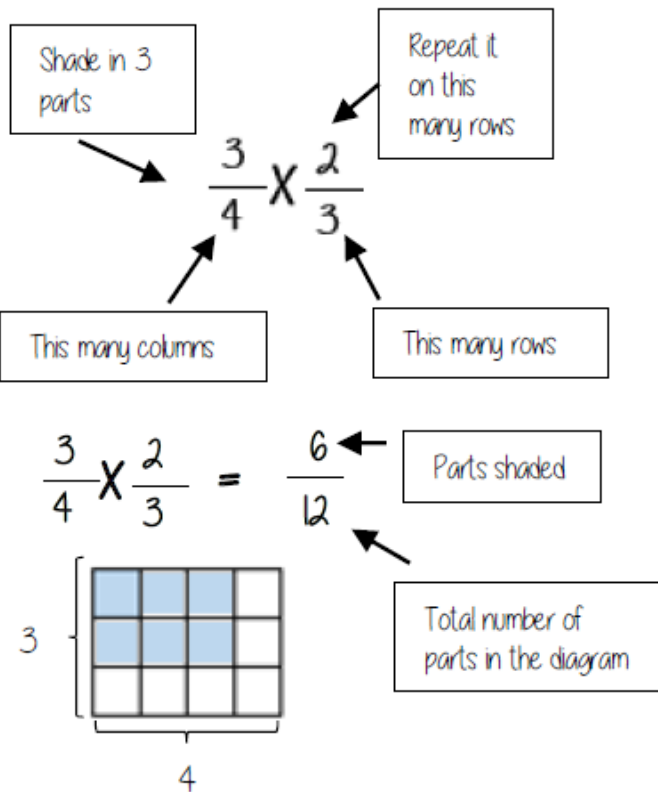
We started with  $\frac{9}{10}$  and then shared out the  $\frac{9}{10}$  to 3 people.

$9 \div 3 = 3$  so each person gets  $\frac{3}{10}$

Does  $\frac{1}{2} \div 3$  really equal  $\frac{1}{6}$  ?

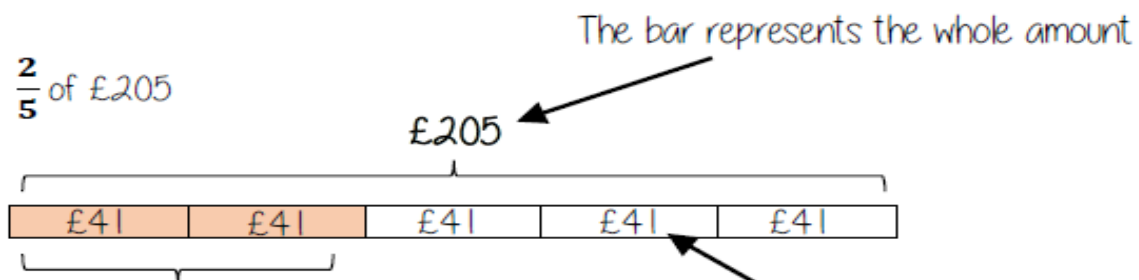


### Multiplying non-unit fractions



### Finding a fraction of a given amount

Find  $\frac{2}{5}$  of £205



2 out of the 5 equal parts  
 $2 \times £41 = \underline{£82}$

$£205 \div 5 = £41$

Each part of the bar model represents £41



# Year 7 Unit 5

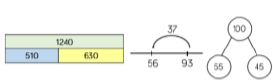
## Applying Addition and Subtraction



Addition	The joining of two or more numbers or quantities.	In <b>addition</b> two or more numbers are joined to get one number which is the <b>sum</b> or the <b>total</b> .
Sum Total	The result of adding; the whole amount	
Subtraction	When one quantity is taken away from another	80 <b>subtract</b> 30 is 50. The <b>difference</b> between 80 and 30 is 50
Difference	The result of subtracting one number from another	
Commutative	Numbers can be added in any order, but in subtraction the order is important.	$a + b = b + a$ $6 + 2 = 8$ or $2 + 6 = 8$
Associative	In addition, no matter how numbers are grouped, the answers will be same.	 $(6 + 3) + 4 = 6 + (3 + 4)$
Inverse	The reverse or opposite of an operation.	 $4 + 2 = 6$ $2 + 4 = 6$ $6 - 4 = 2$ $6 - 2 = 4$
Perimeter	The distance around a polygon.	 Perimeter = $2L + 2W$ Same as: $L + L + W + W$
Profit	Profit occurs when an item is sold for more than it cost to purchase.	
Loss	Loss occurs when an item is sold for less than it cost to purchase.	

### Addition and Subtraction

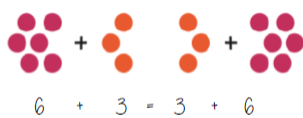
@whisto\_maths



Modelling methods for addition/ subtraction

- Bar models
- Number lines
- Part/ Whole diagrams

Addition is commutative



The order of addition does not change the result

Subtraction the order has to stay the same

$$360 - 147 = 360 - 100 - 40 - 7$$

- Number lines help for addition and subtraction
- Working in 10's first aids mental addition/ subtraction
- Show your relationships by writing fact families

Formal written methods

	H	T	O
+	1	8	7
+	5	4	2

	H	T	O
		4	2
-		2	4
			9

Remember the place value of each column. You may need to move 10 ones to the ones column to be able to subtract

### Addition and Subtraction of decimals

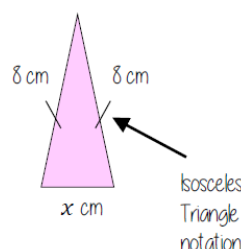
4	.	3	8
7	.	9	0
			+

0 can be used to fill empty places with value

The decimal place acts as the placeholder and aligns the other values

### Perimeter problems

Perimeter is the length around the outside of a polygon



Isosceles Triangle notation

The triangle has a perimeter of 25cm. Find the length of  $x$

$$8\text{cm} + 8\text{cm} + x\text{cm} = 25\text{cm}$$

$$16\text{cm} + x\text{cm} = 25\text{cm}$$

$$x\text{cm} = 9\text{cm}$$

# Year 8 Unit 4 – Geometric Reasoning



Polygon	A 2D shape having 3 or more straight sides.  <b>Regular</b> polygons have all sides and angles equal.	3 sides – triangle 5 sides – Pentagon 7 sides – Heptagon/Septagon 9 sides – Nonagon	4 sides – Quadrilateral 6 sides – Hexagon 8 sides – Octagon 10 sides – Decagon
Parallel	Lines that remain the same distance apart.		
Perpendicular	Lines that <b>intersect</b> (cross over) at right angles.		

<p>3 equal sides 3 equal angles</p> <p><b>Equilateral</b></p>	<p>2 equal sides 2 equal angles</p> <p><b>Isosceles</b></p>
<p>1 angle is a right angle (90°)</p> <p><b>Right-angled</b></p>	<p>no equal sides no equal angles</p> <p><b>Scalene</b></p>

**A quadrilateral is a shape with four sides.**

<p><b>Square</b> 4 equal sides 4 right angles</p>	<p><b>Rectangle</b> opposite sides are equal 4 right angles</p>	<p><b>Trapezium</b> 1 pair of parallel sides</p>
<p><b>Rhombus</b> 4 equal sides opposite sides are parallel opposite angles are equal</p>	<p><b>Parallelogram</b> opposite sides are equal and parallel</p>	<p><b>Kite</b> 2 pairs of adjacent sides are equal</p>

### Sum of angles in a triangle

The two base angles will be the same size

Look at triangle notation. This indicates an isosceles triangle

$\therefore 180 - 43 = 137$   
 $137 \div 2 = 68.5^\circ$

A triangle can only have **ONE** right angle

### Types of angle

**Acute Angle**  $< 90^\circ$

**Right Angle**  $= 90^\circ$

**Obtuse angle**  $90^\circ < \text{Obtuse angle} < 180^\circ$

**Straight Line**  $= 180^\circ$

**Reflex angle**  $180^\circ < \text{Reflex angle}$

### Sum of angles on a straight line

Adjacent angles that share a common point on a line add up to a line  $180^\circ$

Find angle XWY

$72^\circ + 42^\circ = 114^\circ$   
 $180^\circ - 114^\circ = 66^\circ$

### Sum of angles at a point

Find angle BOE

$90^\circ + 33^\circ + 92^\circ = 205^\circ$   
 $360^\circ - 205^\circ$   
**BOE = 155°**

Angle notation – find this missing angle

$360^\circ - 67^\circ = 293^\circ$