Year 7 Scheme of Learning

MODULE 2

Bishop Chadwick
Catholic Education Trust

Bespoke revision

Perimeter, area & volume

Bounce back: Constructions & Loci

Quadratic equations

Compound measures

Percentages, including interest

Year 11

Indices & standard form

Bounce back: Quadratic equations

Construction s & Loci

Probability & diagrams

Perimeter, area & volume

Averages

Angles & Transformation s

Straight line & other graphs

Expressions & equations

Graphs

Year 10

Fractions & percentages

Sequences

Pythagoras & Trigonometry

Ratio & proportion

Pythagoras & Trigonometry

Handling data & measures of location

Angles in parallel lines, lines & polygons

Fractions & percentages

Data handling

Year 9

Algebra: including substituting & brackets

Sequences & Indices

Number; including index laws

Area of trapezia & circles; Line symmetry & reflections

Standard form & number sense

Brackets, equations & inequalities

Sets & probability

Proof

Multiplicative reasoning

Working in Cartesian plane

Ratio & proportion

Year 8

Fraction arithmetic

Geometric reasoning

Prime numbers

Ratio & scale

Multiplying & dividing fractions

Representing data, tables & probability

Operations with equations & directed numbers

Fraction & % of amounts

Fractions, decimals & percentages

Use and understand algebraic notation

Place value and ordering, including decimals

Year 7

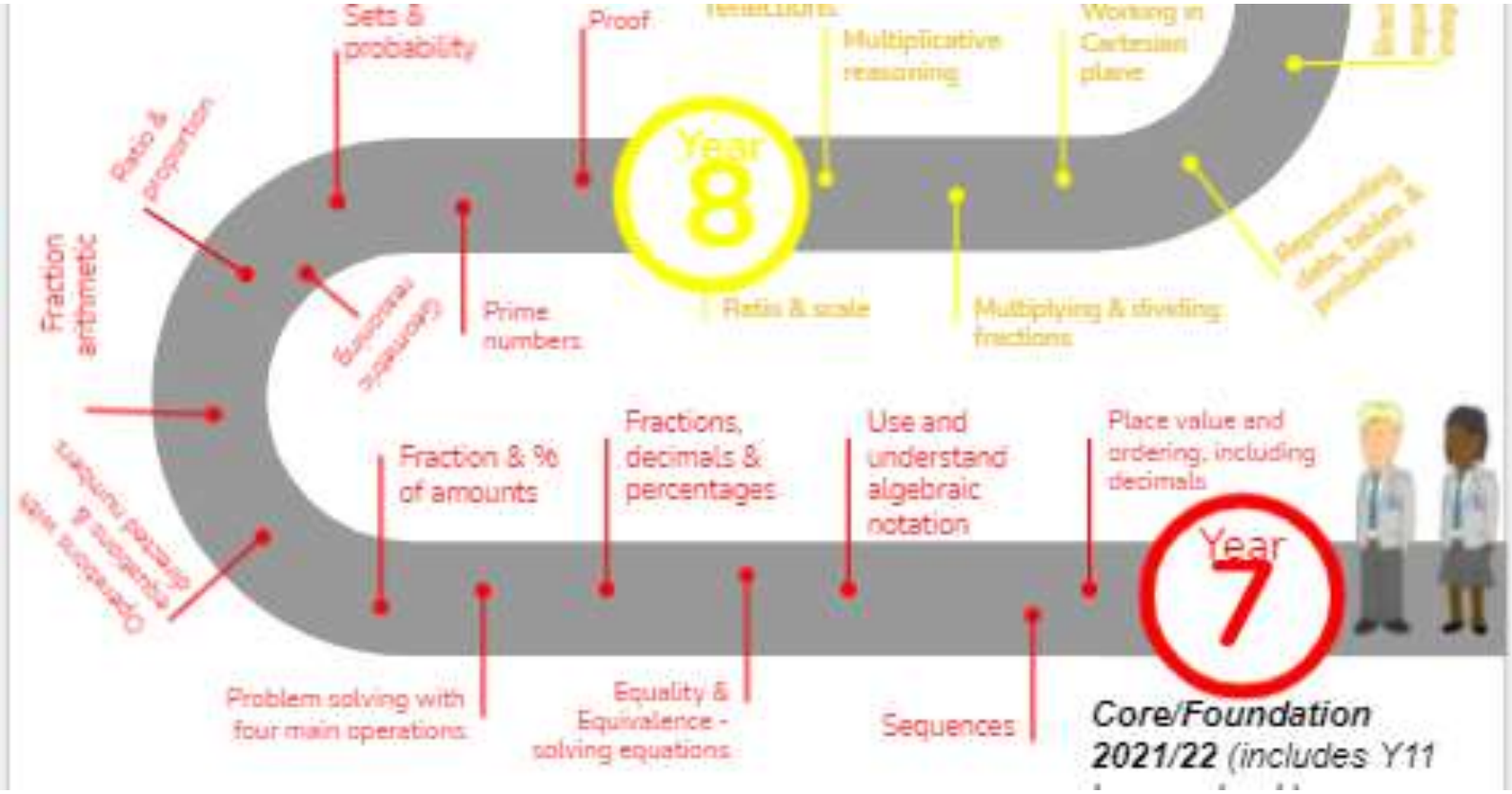
Problem solving with four main operations

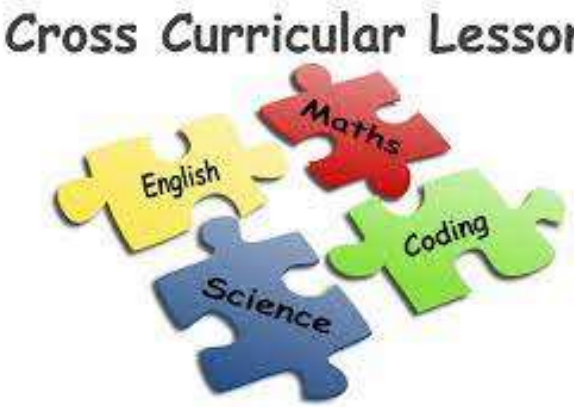
Equality & Equivalence - solving equations

Sequences

Core/Foundation 2021/22 *(includes Y11 bounce back)*

This is what your child will be taught in Year 7 in MATHS





They will have specific lessons linked to other subjects and a diet of retrieval built into their lessons

Caritas Christi Urget Nos

The first 3 topics of Year 7 are:

- Place value and ordering
- Sequences
- Using and understanding algebraic notation

We use the White Rose Maths scheme of learning in Year 7 as our feeder primary schools follow this scheme. It also helps with the transition to Year 7 as pupils are familiar with the resources.

Caritas Christi Urget Nos

Unit 6: Addition & Subtraction

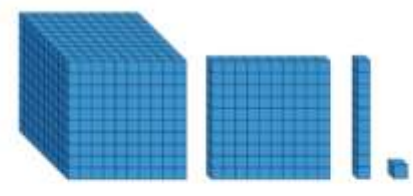
Key vocabulary

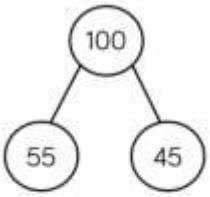
Total	Sum	Difference	Number Line
Commutative	Associative	Inverse	

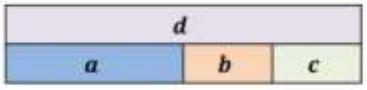
Key questions

Does the column method for subtraction work when dealing with time? Why or why not?
Explain how we could use a number line (or time line) to help us with calculations for time.
Is it true that sum of all the row totals in a table equal to the sum of all the column totals? Why or why not?

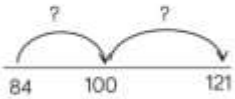
Key Representations

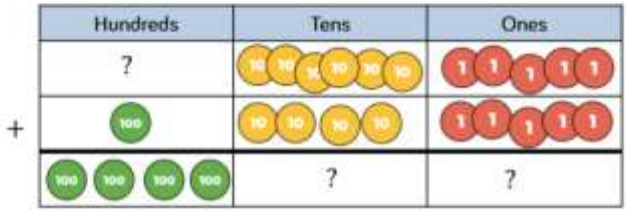




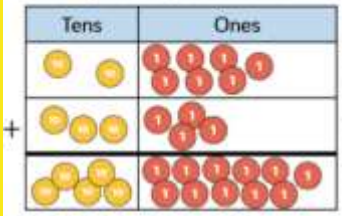


True or False? $a + b = d - c$





Exemplar Questions



What addition calculation is illustrated here?
What exchange needs to be done to complete the calculation?
Compare this to the formal written method for adding two integers.

Complete these calculations.

	H	T	O
	1	8	7
+	5	4	2

	H	T	O
	2	0	7
+	6	4	3

	H	T	O
	3	8	6
+	2	1	5

What are the similarities and differences between the calculations?

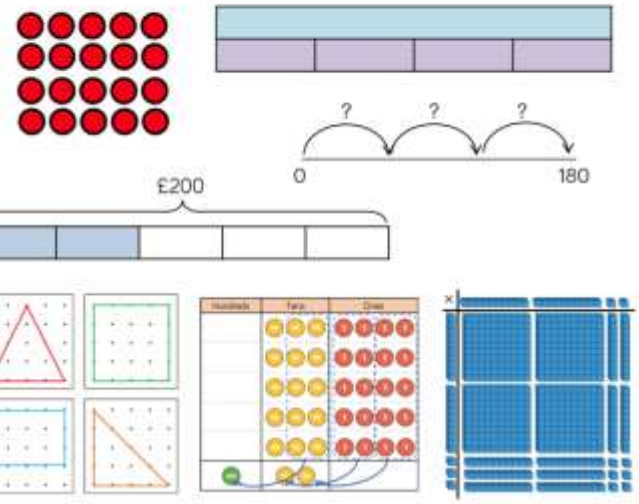
Estimate the answers to these calculations and then use the column method of addition to find the actual answers.

- 2634 more than 1800
- 35172 + sixty-seven thousand
- 485 000 + six hundred and seven thousand
- 850 000 added to half a million
- 7648 + 372 + 5063

Small Steps

- Properties of addition and subtraction
- Mental strategies for addition and subtraction
- Use formal methods for addition of integers
- Use formal methods for addition of decimals
- Use formal methods for subtraction of integers
- Use formal methods for subtraction of decimals
- Choose the most appropriate method: mental strategies, formal written or calculator
- Solve problems in the context of perimeter
- Solve financial maths problems

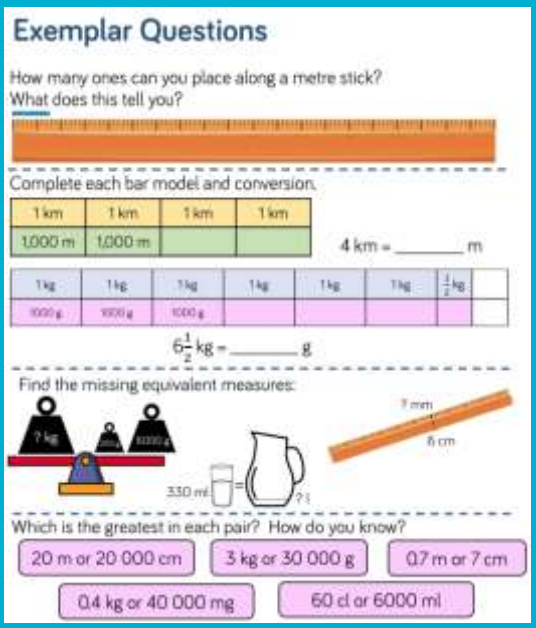
Key Representations



Small Steps

- Properties of multiplication and division
- Understand and use factors
- Understand and use multiples
- Multiply and divide integers and decimals by powers of 10
- **Multiply by 0.1 and 0.01**
- Convert metric units
- Use formal methods to multiply integers
- Use formal methods to multiply decimals
- Use formal methods to divide integers
- Use formal methods to divide decimals
- Understand and use order of operations
- Solve problems using the area of rectangles and parallelograms
- Solve problems using the area of triangles
- **Solve problems using the area of trapezia**
- Solve problems using the mean
- **Explore multiplication and division in algebraic expressions**

Exemplar Questions



Key questions

How do multiples relate to times-table facts?
Is 0 a multiple of every number?
Can multiples be negative?
Do multiples have to be a whole number?
Explain how 18 can be both a factor and a multiple of a number.

Unit 7: Multiplication & Division

Key vocabulary

Factor	Array	Venn diagram
Odd	Even	Integer

Key vocabulary

Place value	Divisor	Dividend
Quotient	Remainder	

Key questions

How do you estimate the answer to a decimal multiplication?
Explain why $6.4 \times 24 = 2.4 \times 64$. Tell me three more multiplications using these digits that have the same answer.

Small Steps

- Find a fraction of a given amount
- Use a given fraction to find the whole and/or other fractions
- Find a percentage of a given amount using mental methods
- Find a percentage of a given amount using a calculator
- **Solve problems with fractions greater than 1 and percentages greater than 100%**

Exemplar Questions

Use the bar model to help you work out $\frac{2}{5}$ of £95

Work out: $\frac{1}{8}$ of 720 lbs $\frac{3}{8}$ of 720 lbs $\frac{5}{9}$ of 8.19 km $\frac{11}{10}$ of 120 kg

Ron bakes 280 cookies on Monday.
On Tuesday he bakes $\frac{1}{8}$ as many more cookies.
How many cookies did he bake altogether over the two days?

Tommy and Whitney each make a tower made up of red and blue bricks. They each use the same number of blue bricks.

- $\frac{3}{8}$ of Tommy's tower is made up of blue bricks.
- $\frac{1}{3}$ of Whitney's tower is made up of blue bricks.
- Tommy uses 48 red bricks.

How many bricks are there in Tommy's tower?

Sort these cards into pairs with equal values. What do you notice?

$\frac{1}{2}$ of 30	$\frac{2}{3}$ of 60	$\frac{3}{8}$ of 160	$\frac{1}{4}$ of 60
$\frac{6}{7}$ of 210	$\frac{3}{4}$ of 80	$\frac{1}{3}$ of 120	$\frac{2}{7}$ of 630

Key questions

Why is it that you divide by 10 to find 10% of a number, but you don't divide by 20 to find 20% of a number?

If you know 10% of a number, what other percentages can you easily work out?

Find as many ways as you can to work out 60% of 45

Key vocabulary

Place value	Percent	Percentage
Decimal	Convert	Equivalent

Key questions

Can 110% of the class be absent on one day?

If the price of an item increases by 60%, what percentage is the new price of the old price?

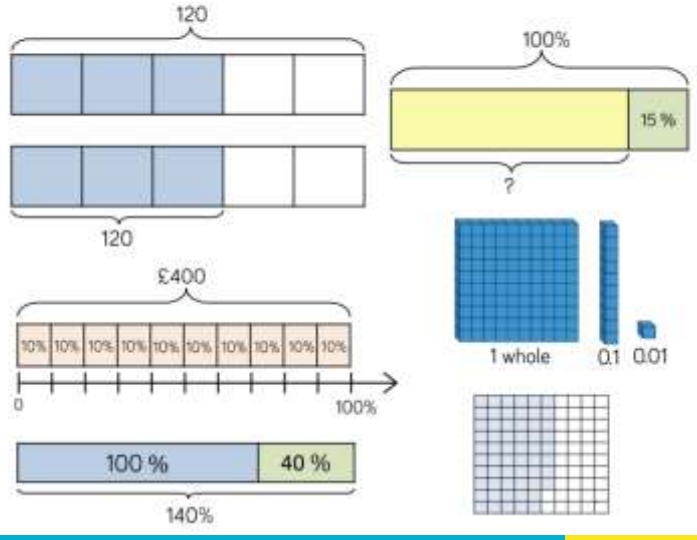
Can a price increase/decrease by 180% or 200%?

Unit 8: Fraction & Percentage of amount

Key vocabulary

Fraction	Equivalent	Numerator
Denominator	Whole	

Key Representations



Unit 9: Operations with equations & direct numbers

Key vocabulary

Positive	Negative	Reflection
Symmetric	Sea level	

Key questions

How could you use the number line to help perform this calculation?
What is $4 - 4$? What is $-4 + 4$? What do you notice?
How is $-3m + 5m$ different from $-3 + 5$?
How are they the same?

Key vocabulary

Solve	Equation	Balance
Solution	Function machine	Zero pair

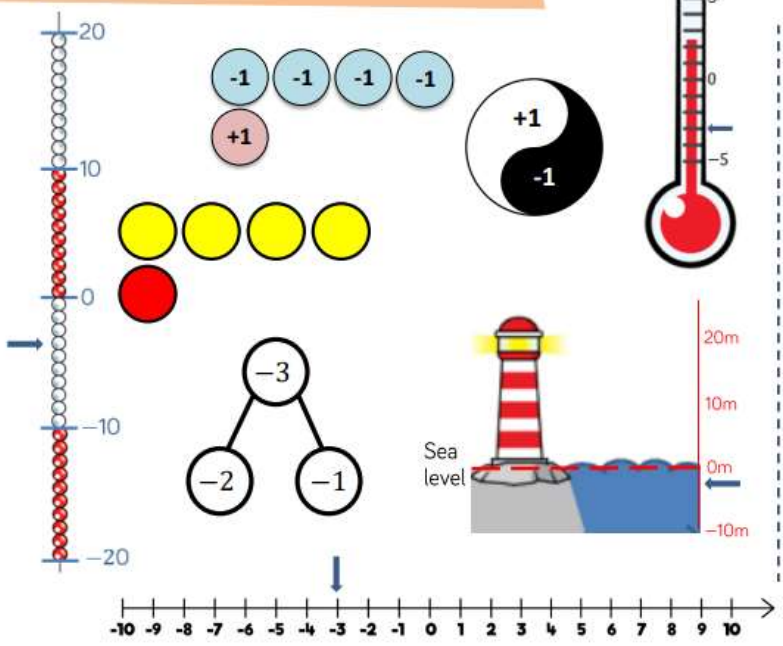
Key vocabulary

Square	Square root	Inverse
Positive	Negative	Power

Small Steps

- Understand and use representations of directed numbers
- Order directed numbers using lines and appropriate symbols
- Perform calculations that cross zero
- Add directed numbers
- Subtract directed numbers
- Multiplication of directed numbers
- Multiplication and division of directed numbers
- Use a calculator for directed number calculations
- Evaluate algebraic expressions with directed number
- Introduction to two-step equations
- Solve two-step equations
- Use order of operations with directed numbers
- **Roots of positive numbers**
- **Explore higher powers and roots**

Key Representations



Exemplar Questions

Put the following temperatures in order from coldest to hottest.

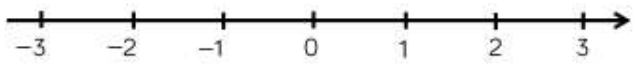
2°C, −1°C, −7°C, 0°C, 12°C

Complete the statements using > or <

- −2°C ◯ −6°C
- −6°C ◯ 4°C
- −9°C ◯ 0°C
- −26°C ◯ −24°C
- 15°C ◯ −115°C
- −6°C ◯ −6.2°C

Use the number line to help you put these numbers in ascending order.

- $\frac{1}{4}$
- −1.5
- $-\frac{1}{4}$
- $-1\frac{3}{4}$
- −1
- 2.5



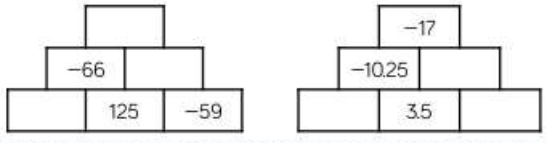
Exemplar Questions

Compare the calculations using <, > or =

- $17 - -0.5 + -2.7$ ◯ $17 - (2.7 - 0.5)$
- $(-2.3)^2 \times -1.38$ ◯ $-2.3^2 \times -1.38$
- $\frac{116.5 + -8.9}{-2}$ ◯ $116.5 + -8.9 \div -2$

What's the same and what's different about the pairs of calculations?

Complete the addition pyramids.



−5 7 −2 10

Using **each** number card and any operations, can you make each of the target numbers? Can you find more than one way?

20 250 42 −40

Key vocabulary

Equal parts	Congruent	Divide
Denominator	Numerator	

Key vocabulary

Denominator	Numerator	Mixed number
Whole	Addition	Subtraction

Key questions

Why do we need a common denominator to add fractions?

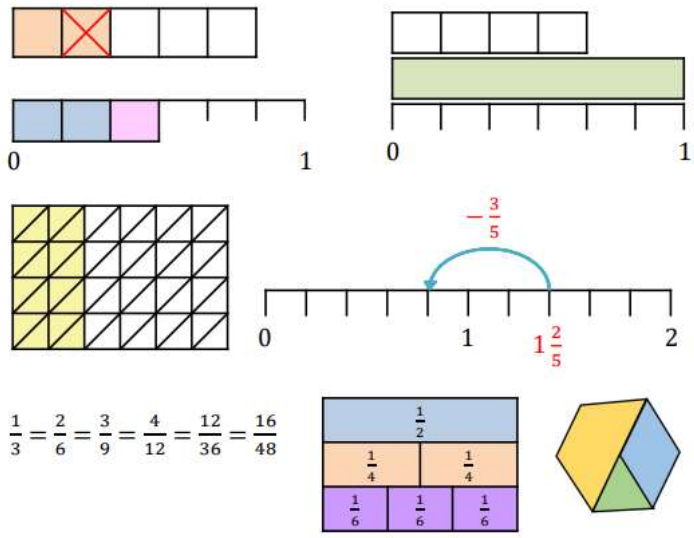
Why is $\frac{1}{10}+\frac{7}{10}$ easier to calculate than $\frac{1}{10}+\frac{7}{15}$?

Is it possible to subtract a larger fraction from a smaller one e.g. $\frac{1}{4}-\frac{1}{2}$?

Key vocabulary

Simplify	Like terms	Collect
In terms of	Common denominator	

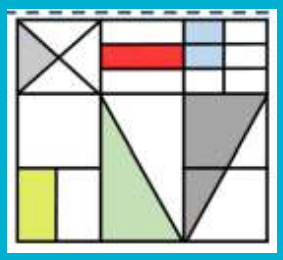
Key Representations



$\frac{1}{3}=\frac{2}{6}=\frac{3}{9}=\frac{4}{12}=\frac{12}{36}=\frac{16}{48}$

Complete the statements.

$1\frac{\square}{3}=\frac{5}{\square}$ $\qquad$ $\frac{13}{\square}=3\frac{\square}{\square}$



Exemplar Questions

If $p=4$ and $d=6$, work out the values of these expressions.

$\frac{1}{p}+\frac{1}{d}$ $\qquad$ $p-\frac{5}{d}$ $\qquad$ $\frac{1}{p^2}-\frac{1}{p}$ $\qquad$ $\frac{p}{d}+\frac{d}{p}$

Write the first five terms for the sequence given by the rule $\frac{2n}{5}$

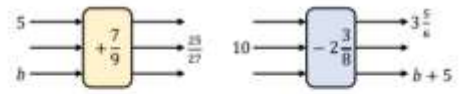
What's the term-to-term rule of the sequence?

Is the sequence linear or geometric?

What would the 100th term of the sequence be?

How often are the terms in the sequence integers?

Find the missing inputs and outputs for the following function machines:



Solve the equations

$k-\frac{5}{8}=2$ $\qquad$ $\frac{5}{8}+y=2$ $\qquad$ $5\frac{1}{5}=2g-\frac{4}{5}$ $\qquad$ $\frac{r}{4}-\frac{7}{5}=-\frac{2}{5}$

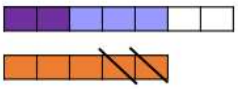
Unit 10: Addition & Subtraction of fractions

Small Steps

- Understand representations of fractions
- Convert between mixed numbers and fractions
- Add and subtract unit fractions with the same denominator
- Add and subtract fractions with the same denominator
- Add and subtract fractions from integers expressing the answer as a single fraction
- Understand and use equivalent fractions
- Add and subtract fractions where denominators share a simple common multiple
- Add and subtract fractions with any denominator
- Add and subtract improper fractions and mixed numbers
- Use fractions in algebraic contexts
- Use equivalence to add and subtract decimals and fractions
- **Add and subtract simple algebraic fractions**

Exemplar Questions

Use the bar model to work out: $\frac{2}{7}+\frac{3}{7}$

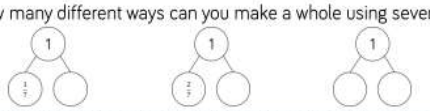


Use this bar model to complete the following $\frac{\square}{5}-\frac{2}{\square}=\frac{\square}{\square}$

Represent the calculations pictorially and work out each answer:

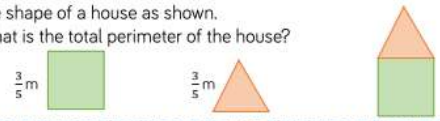
$\frac{2}{5}+\frac{3}{5}$ $\qquad$ $\frac{2}{4}+\frac{3}{4}-\frac{1}{4}$ $\qquad$ $\frac{2}{4}+\frac{3}{4}+\frac{2}{4}$ $\qquad$ $\frac{7}{23}-\frac{3}{23}-\frac{4}{23}$ $\qquad$ $\frac{3}{5}-\frac{4}{5}$

How many different ways can you make a whole using sevenths?



The following equilateral triangle and square are put together to make the shape of a house as shown.

What is the total perimeter of the house?



What is the term-to-term rule for the following sequences?

$\frac{1}{3}, 1, 1\frac{2}{3}, 2\frac{1}{3}, 3, \ldots$ $\qquad$ $4\frac{1}{5}, 3\frac{3}{5}, 3, 2\frac{2}{5}, 1\frac{4}{5}, \ldots$

What would the next two terms for each sequence be?

Are the sequences linear or geometric?

We recommend pupils have a Casio scientific calculator.
The Casio calculator featured is the one we use when demonstrating in lessons.

On our school website there is a calculation policy showing the methods we use for common operations. It can be found at: Our School > Policies