**Curriculum Overview for Mathematics**

**Year 9**

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| **Half Term 5: Sequences****Declarative Knowledge:*** Identify if a term is in a sequence using the nth term rule
* Recall the first 15 square numbers

**Procedural Knowledge:*** Use arrays to show a sequence of multiples
* Describe a positive, increasing sequence of multiples in a sentence
* Describe a positive, increasing sequence of multiples with something added
* Identify the multiples being shown in an array sequence and what has been added
* Write an nth term rule for a positive, increasing sequence shown pictorially
* Identify the rate of change in a given positive, increasing sequence of numbers
* Identify the constant difference in a given positive, increasing sequence of numbers
* Write an nth term rule for a positive, increasing sequence of numbers
* Identify the constant difference when it is negative and write an nth term
* Generate a sequence from an nth term rule
* Generate a sequence in the form -an and -an ± c
* Write an nth term rule for a decreasing sequence of numbers
* Use arrays to represent the sequence of square numbers
* Investigate the term-to-term rule for the square numbers
* Generate Square numbers and positive constant
* Recognise Square numbers and positive constant
* nth term square numbers and positive constant
* Square numbers and negative constant
* Generate Square numbers and negative constant
* Generate and use nth term for square numbers and negative constant
* Square numbers and positive, increasing linear sequence
* Square numbers and any linear sequence
* Multiples of the square number (an2) using arrays
* Generate sequences using an2
* Identifying a using the 2nd difference
* nth term an2 + bn + c
* Continue quadratic sequences
* ﻿Identify if a sequence is linear, quadratic, or the sequence of square numbers
* Generating terms in the sequences of square, cube and triangular numbers
* Identifying the constant ratio in geometric sequences
* Continue geometric sequences
* Make a sequence linear, geometric or quadratic
* Continue Fibonacci-type sequences
* Identify if a sequence is linear, quadratic, square, cube, triangilar, geometic or Fibonacci-type
* Make a sequence that is linear, quadratic, square, cube, triangular, geometric of Fibonacci-type

**Conditional Knowledge:** * Investigating the 2nd difference for an2
* \*Proof- Sum of consecutive square numbers etc (not included, hoping to add another time)
* Introduction to The Fibonacci sequence
* Use T(n) notation for Fibonacci sequences (not included, hoping to add another time)
 | Books | Modelling reading of questions by the class teacher – teaching like a Mathematician Key words on top sheet are shared with children, including syllabification when they appear in the learning Expectation of Mathematical vocabulary used in lessons |
| Speech | Linear, quadratic, square, cube, triangle, Fibonacci, geometric, term, position, nth term, sequence, multiples, generate, difference, index/indices |
| Checklist RTL | There will be a formal end of half-unit exam. There is an expectation of revision to take place at home. Children will relearn during an Exam Review lesson after the assessment and complete a Whole Class Feedback sheet.  |
| Home | Knowledge Recall Booklet – a selection of recall questions that is set at the start of the half-term and returned for marking at the end of the half-term.Dr Frost Maths – practising skills using DrFrost.org (a unique username and password will be provided by the school).Revision for end of unit exams. This will include Dr Frost Maths practise, but may also include extra revision set by the teacher, including practising past exam questions, creating revision cards, creating mindmaps, etc.  |
| **Half Term 5: Construction****Declarative Knowledge:*** Know that there are 180 degrees in a triangle
* Know the different types of triangle
* Know that equilateral triangles have equal length sides and all internal angles are equal
* Know that isosceles triangles have a pair of equal length sides and a pair of internal angles that are equal
* Know that right-angled triangles have a right-angle (90 degrees)
* Know that right-angled isosceles triangles have a pair of equal length sides, a pair of internal angles that are equal and a right-angle
* Know that scalene triangles have all different sizes angles and different sizes length
* Know that when measuring you start at 0
* Know that degrees are the unit of measurement for a turn
* Know that protractors are the mathematical instrument used to measure degrees

**Procedural Knowledge:*** Be able to convert between metric units of measurement for length
* Be able to use a protractor to measure angles
* Be able to draw an angle using a protractor and ruler
* Be able to use a pair of compasses to mark points that are a given length
* Use ruler and compasses to construct the perpendicular bisector of a line segment
* Use ruler and compasses to bisect an angle
* Use a ruler and compasses to construct a perpendicular to a line from a point and at a point
* Know how to construct the locus of points a fixed distance from a point and from a line

**Conditional Knowledge:*** Solve word problems that require the use of constructing SAS/ASA/SSS triangles
* Solve simple problems involving loci
* Combine techniques to solve more complex loci problems
 | Books | Modelling reading of questions by the class teacher – teaching like a Mathematician Key words on top sheet are shared with children, including syllabification when they appear in the learning Expectation of Mathematical vocabulary used in lessons |
| Speech | Triangle, degrees, angle, turn, around a point, internal angle, side, right-angle, isosceles, equilateral, scalene, centimetre, millimetre, protractor, ruler, ASA, SAS, SSS, construction, compasses, arc, line, segment, perpendicular, bisect, perpendicular bisector, locus, loci |
| Checklist RTL | There will be a formal end of half-unit exam. There is an expectation of revision to take place at home. Children will relearn during an Exam Review lesson after the assessment and complete a Whole Class Feedback sheet.  |
| Home | Knowledge Recall Booklet – a selection of recall questions that is set at the start of the half-term and returned for marking at the end of the half-term.Dr Frost Maths – practising skills using DrFrost.org (a unique username and password will be provided by the school).Revision for end of unit exams. This will include Dr Frost Maths practise, but may also include extra revision set by the teacher, including practising past exam questions, creating revision cards, creating mindmaps, etc.  |
| **Half Term 6: Pythagoras’ Theorem****Declarative Knowledge:*** Calculate with square numbers
* Recall square numbers and their root up to 122
* Know and recall Pythagoras's theorem formula

**Procedural Knowledge:*** Use a calculator to square numbers and square root numbers
* Identify the hypotenuse of a right-angled triangle
* Use a2 + b2 = c2 to find the length of the hypotenuse of a right-angled triangle
* Use a2 + b2 = c2 to find the length of a right-angled triangle that is not the hypotenuse
* Use Pythagoras's theorem to find the area of squares attached to a right-angled triangle

**Conditional Knowledge:*** Apply Pythagoras's theorem to find the length of lines and solve problems
* Apply Pythagoras’s theorem to find the length of lines and solve problems with compound shapes
* Apply Pythagoras's theorem with 3D shapes
 | Books | Modelling reading of questions by the class teacher – teaching like a Mathematician Key words on top sheet are shared with children, including syllabification when they appear in the learning Expectation of Mathematical vocabulary used in lessons |
| Speech | Pythagoras, hypotenuse, opposite, adjacent, right-angled, triangle, side, length, square number, square root, to square, |
| Checklist RTL | There will be a formal end of half-unit exam. There is an expectation of revision to take place at home. Children will relearn during an Exam Review lesson after the assessment and complete a Whole Class Feedback sheet.  |
| Home | Knowledge Recall Booklet – a selection of recall questions that is set at the start of the half-term and returned for marking at the end of the half-term.Dr Frost Maths – practising skills using DrFrost.org (a unique username and password will be provided by the school).Revision for end of unit exams. This will include Dr Frost Maths practise, but may also include extra revision set by the teacher, including practising past exam questions, creating revision cards, creating mindmaps, etc.  |