Cody Oaks Curriculum Pathway

(SUBJECT)

Post 16

Destination opportunities (KS5):

SPR 2 | SUM 1 | SUM 2

SPR 1 | AUT 2 | AUT 1:

Year 11

Therapeutic approach

SPR 1 | SUM 1 | SUM 2

SPR 1 | AUT 2 | AUT 1:

Year 10

SPR 2—**Probability and Statistics**

- Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale.
- Understand that the probabilities of all possible outcomes sum to 1.
- Enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams.
- Generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities.
- Describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers).
- Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data.
- Describe simple mathematical relationships between two variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs.

SUM 1—**Geometry and Measure**

- Consolidate, derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders).
- Consolidate, derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to derive properties of regular polygons.
—Use Pythagoras' Theorem and trigonometric ratios in similar triangles to solve problems involving right-angled triangles.
—Use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3-D
- Interpret mathematical relationships both algebraically and geometrically.

SUM 2—**Geometry and Measure**

- Draw and measure line segments and angles in geometric figures, including interpreting scale drawings.
-Derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line .
- Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric..
- Identify properties of, and describe the result. of, translations, rotations and reflections applied to given figures.
- Identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids

SPR 1—**Ratio, proportion & rates of change**

- Understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction.
- Relate the language of ratios and the associated calculations to the arithmetic of fractions and to linear functions.
- Solve problems involving percentage change, including: percentage increase, decrease and original value problems and simple interest in financial mathematics.
- Solve problems involving direct and inverse proportion, including graphical and algebraic representations.
- Use compound units such as speed, unit pricing and density to solve problems

AUT 2: **Algebra**

Reduce a given linear equation in two variables to the standard form y = mx + c; calculate and interpret gradients and intercepts of graphs of such linear equations numerically, graphically and algebraically .

Use linear and quadratic graphs to estimate values of y for given values of x and vice versa and to find approximate solutions of simultaneous linear equations.
Find approximate solutions to contextual problems from given graphs of a variety of functions, including piece-wise linear, exponential and reciprocal graphs.
Generate terms of a sequence from either a term-to-term or a position-to-term rule.
Recognise arithmetic sequences and find the nth term.

AUT 1: **Number**

- use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations
- interpret and compare numbers in standard form A x 10^n $1 \leq A < 10$, where n is a positive or negative integer or 0.
- use a calculator and other technologies to calculate results accurately and then interpret them appropriately

- appreciate the infinite nature of the sets of integers, real and

Year 9

Therapeutic approach

SPR 2— **Statistics**

- Describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers).
- Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data.
- Describe simple mathematical relationships between two variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs.

SUM 1—**Geometry and Measure**

- Use the standard conventions for labelling the sides and angles of triangle ABC, and know and use the criteria for congruence of triangles.
- Derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures [for example, equal lengths and angles] using appropriate language and technologies.
- Identify properties of, and describe the result. of, translations, rotations and reflections applied to given figures.
- Identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids

SUM 2—**Geometry and Measure**

- Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to derive results about angles and sides, including Pythagoras' Theorem, and use known results to obtain simple proofs.
—Use Pythagoras' Theorem and trigonometric ratios in similar triangles to solve problems involving right-angled triangles.
—Use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3 -D
- Interpret mathematical relationships both algebraically and geometrically.

SPR 1—**Ratio, proportion & rates of change**

- Understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction.
- Relate the language of ratios and the associated calculations to the arithmetic of fractions and to linear functions.
- Solve problems involving percentage change, including: percentage increase, decrease and original value problems and simple interest in financial mathematics.
- Solve problems involving direct and inverse proportion, including graphical and algebraic representations.
- Use compound units such as speed, unit pricing and density to solve problems

AUT 2—**Algebra**

- Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs.
- Use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement)
- Work with coordinates in all four quadrants.
- Recognise, sketch and produce graphs of linear and quadratic functions of one variable with appropriate scaling, using equations in x and y and the Cartesian plane.
- Interpret mathematical relationships both algebraically and graphically

AUT 1: **Number**

- work interchangeably with terminating decimals and their corresponding fractions.
- define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express 1 quantity as a percentage of another, compare 2 quantities using percentages, and work with percentages greater than 100%- interpret fractions and percentages as operators
- use standard units of mass, length, time, money and other measures, including with decimal quantities
- round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures]
- use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation $a<x\leq b$

Year 8

SPR 2: **Probability**

- Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale.
- Understand that the probabilities of all possible outcomes sum to 1.
- Enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams.
- Generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities.

SUM 1: **Geometry and Measure**

- Calculate and solve problems involving: perimeters of 2D shapes incl. circles, areas of circles and composite shapes.
- Derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders)
- Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles.
- Understand and use the relationship between parallel lines and alternate and corresponding angles.
- Derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to derive properties of regular polygons.

SUM 2: **Geometry and Measure**

- Draw and measure line segments and angles in geometric figures, including interpreting scale drawings.
-Derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line .
- Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric.

SPR 1: Ratio, proportion & rates of change

- Change freely between related standard units [for example time, length, area, volume/capacity, mass]
- Use scale factors, scale diagrams and maps.
- Express one quantity as a fraction of another, where the fraction is less than 1 and greater than 1.
- Use ratio notation, including reduction to simplest form.
- Divide a given quantity into two parts in a given part:part or part:whole ratio; express the division of a quantity into two parts as a ratio

AUT 2: Algebra

- Use and interpret algebraic notation, including.
Substitute numerical values into formulae and expressions, including scientific formulae.
- Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors.
- Simplify and manipulate algebraic expressions to maintain equivalence
- Understand and use standard mathematical formulae; rearrange formulae to change the subject.

AUT 1: Number

- Understand and use place value for decimals, measures and integers of any size.
- Order positive and negative integers, decimals and fractions; use number line as a model for ordering; use all symbols.
- Use concepts and vocabulary of prime numbers, factors, multiples, common factors and multiples and HCF/LCM, prime factorisation including using product notation.
- Use 4 operations including formal written methods applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative
- use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals
- recognise and use relationships between operations including inverse opera-

Year 7

Therapeutic approach

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SPR 1: **Fractions, Decimals, Percentages**
- Compare and order fractions.
- Use common factors and multiples to simplify fractions.
- Add and subtract fractions with different denominators and mixed numbers.
- Multiply simple pairs of fractions with answers in simplest form.
- Divide fractions by whole numbers.
- Calculate decimal, fraction and percentage equivalents.
- Multiply 1 digit numbers with up to 2 decimal places by whole numbers.

SUM 1: **Geometry and Algebra**
- Use simple formulae
- Generate and describe linear number sequences.
- Express missing number problems algebraically.
- Find pairs of numbers that satisfy an equation with 2 unknowns.
- Enumerate possibilities of combinations of 2 variables.

Draw 2D shapes using given dimesons and angles.
- Recognise, describe and build 3D shapes including nets.
- compare and classify geometric shapes based on their properties

SUM 2: **Statistics and Ratio and Proportion**
- Interpret and construct pie charts and line graphs and use these to solve problems.
- Calculate and interpret the mean as an average.
- Solve problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division facts.
- Solve problems involving the calculation of percentages and use of percentages for comparison.
- Solve problems involving similar shapes where the scale factor is known or

SPR 2: **Measurement and Geometry (Shape)**
- Calculate and convert measurements between standard units of length, mass, volume and time including miles and kilometres from smaller and larger units of measure using decimal notations up to 3dp.
- Recognise that shapes with the same areas can have different perimeters and vice versa.
- Recognise when to use formulae for area and volume of shapes—including parallelograms and triangles.
- Calculate, estimate and compare volume of cubes and cuboids using standard units including cubic cm and cubic m.
- recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles

AUT 2: **Number—four operations.**
- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written methods.
- divide numbers up to 4 digits by a two-digit whole number using the formal written method and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate.

Divide numbers up to 4 digits by a two-digit number using the formal written method interpreting remainders according to the context.
-perform mental calculations, including with mixed operations and large numbers.
- identify common factors, common multiples and prime numbers.
- use their knowledge of the order of operations to carry out calculations involving

AUT 1: **Number and Place Value**
- read, write, order and compare numbers up to 10 000 000 and determine the value of each digit including decimals up to 3dp.
- round any whole number to a required degree of accuracy.
- use negative numbers in context, and calculate intervals across zero.
- solve number and practical problems that involve all of the above.
- read Roman numerals to 1000 (M) and recognise years written in Roman numerals.

Year 6

SPR 2: Fractions, Decimals & Percentages
- read and write decimal numbers as fractions linking to 100, 50, 25 and 75.
- recognise and use decimals up to 3 decimal places.
- round decimals with two decimal places to the nearest whole number and to one decimal place.
- read, write, order and compare numbers with up to three decimal places.
- solve problems involving numbers up to three decimal places.
- recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal.
-solve problems which require knowing percentage and decimal equivalents of 1/2 , 1/4 , 1/5 , 2/5 and 4/5and those fractions with a denominator of a multiple of 10 or 25.

SUM 1: Measurement
- measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
- calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes.
- convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)
- understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.
- estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water]
- solve problems involving converting between units of time.
- use all four operations to solve problems involving measure [, length, mass,

SUM 2: **Geometry, Position, direction, Statistics**
- identify 3-D shapes, including cubes and other cuboids, from 2-D representations.
-know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles.
- draw given angles, and measure them in degrees (o)
- identify:
-angles at a point and one whole turn (total 360o)
- angles at a point on a straight line and 2 1 a turn (total 1800.
- other multiples of 90o.
- use the properties of rectangles to deduce related facts and find missing lengths and angles.
- distinguish between regular and irregular polygons based on reasoning about equal sides and angles.

SPR 1: Fractions, Decimals
- compare and order fractions whose denominators are all multiples of the same number.
- identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.
- recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, 5 2 + 5 4 = 5 6 = 1 5 1]
- add and subtract fractions with the same denominator and denominators that are multiples of the same number.
- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.
- read and write decimal numbers as fractions [for example, 0.71 = 100 71]
- recognise and use thousandths and relate them to tenths, hun-

AUT 2: Number(addition, subtraction/Multiplication, division)
- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) - add and subtract numbers mentally with increasingly large numbers.
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- Identify factors and multiples (common and pairs), identify prime numbers and vocabulary and establish a prime number up to 100.
- Multiply (up to 4 digit by 2 digit) and divide 4 by 1 digit) using formal methods and recalling multiplication/division facts.
- Recognise and use squared and cubed.
- Solve multi-step problems using 4 operations, multiples, factors,

AUT 1: Number and Place Value
- read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit.
- count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000.
- interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero.
- round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.
- Multiply/divide whole numbers and decimals by 10, 100 and 1000.
- solve number problems and practical problems that involve all of the above.

Year 5

Therapeutic approach

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