

Maths Scheme of Work Overview



Scheme of work sequence/flow

At Dene Magna, in Maths we follow a balanced scheme of work that is reviewed each year. The KS3 scheme of work builds steadily on previous KS2 knowledge and exposes students to a wide variety of fundamental concepts beyond basic numeracy. The flow (particularly in year 7) mixes new concepts with some recapping of KS2 skills in order to build confidence and ensure all students have a good knowledge foundation irrespective of their primary school experience. The KS3 content is also designed to allow time and flexibility for plenty of discovery activities and fun, whether pancake day maths, Black Friday themed learning, competitions and quizzes. Please have a look at our 'Intent' document for more information.

In year 7, students are taught largely in mixed ability groups (in order for middle attainers to be encouraged upwards in their ability), with only a few slower-paced learners being allocated to a 'progress' group where learners will follow a simplified stage 6 SOW which recaps more KS2 content. In year 8, all students are put into groups according to their speed of learning and all students flow onto the next stage of the scheme of work. In year 9 where we start to deliver GCSE content, students will still be in groups according to their ability and learning speed, but will follow either a Higher paper curriculum, a Foundation paper curriculum or a 'crossover' where classes are exposed to some Higher content to see how they respond and so the right decision can be made in year 10. In year 11, teachers finish the Higher or Foundation curriculums as started in year 9/10 and generally finish teaching before Christmas, with teachers actively identifying weak knowledge areas of the class, and teaching to fill gaps. From year 9 onwards students mark the transition to GCSE studies with a move away from books to categorised folders which will form a comprehensive revision resource in time.

		Speed related groups	Speed related groups	Speed related groups	Speed related groups
Year	7	8	9	10	11
Group 1	Mixed ability (Stage 7 SOW)	Stage 8 SOW	Higher	Higher	Higher
Group 2			Crossover		
Group 3				Foundation	
Group 4					
Group 5					
Group 6	Progress (Stage 6 SOW)	Stage 7 SOW	Foundation	Foundation	Foundation
Group 7					

In KS3, we generally change teachers at the end of each year (to expose them to a variety of teachers and teaching styles), but we do try to keep the teacher consistent during KS4 so that teachers get to know students and their families well in order for them to be most successful during GCSE assessments.

Irrespective of the speed of learning of a group, assessments are carried out after teaching a few topics so that student progress can be monitored alongside homework scores and any group changes made. Teachers track their delivered topics in a live SOW document so that overall progress can be monitored. We also teach with a 'mastery' approach so teachers can teach for depth as time allows. The SOW is paced such that faster groups do have extra time to be stretched and to deepen their understanding.

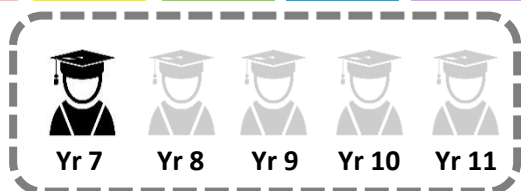


For students that choose to study one of our 3 KS5 Maths offerings at our sixth form, our strategy is once again to follow a clear sequence of topics, but we try to minimise the number of teachers at any one time. Further Maths students are currently taught by one member of staff, and A level students are taught by different teachers for pure versus mechanics or statistics. We find that this modular approach reduces the number of teachers at any time, and builds momentum/pace in learning. We currently have two A level Maths classes (both around 12 in size) but these are not grouped by ability, only by timetable logistics to match their other A level choices.



Stage 6 SOW

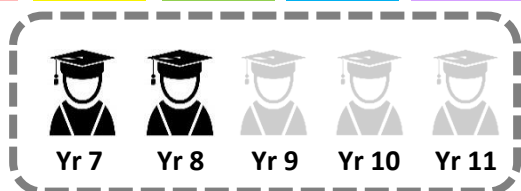
Number	Ratio & Proportion	Shape	Algebra	Statistics
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Stage 7 SOW

Number	Ratio & Proportion	Shape	Algebra	Statistics
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Stage 8 SOW

Number

Ratio & Proportion

Shape

Algebra

Statistics

Probability



Yr 7



Yr 8



Yr 9



Yr 10



Yr 11

Book standards

- Date & WALT writing
- Vertical workings
- Lesson interaction

Number system

- Prime factorisation
- HCF and LCM
- Rounding to d.p and s.f.
- Standard form.

Directed Numbers

- Operations with -ve numbers
- BIDMAS with -ves
- Use a calculator with negatives

Transformations

- Enlargement of shapes
- Rotation of shapes
- Translation of shapes
- Reflection of shapes
- Describing Transformations

Probability

- P vocabulary
- Listing outcomes
- Probability scale
- Simple probability
- Frequency trees

Exploring FDP

- Recurring and terminating fractions and decimals
- Convert between fractions and decimals

Black Friday Activity

20% OFF

Algebra Proficiency

- Recap notation and simplifying
- Expanding and Factorising
- Use laws of indices
- Substitution
- Change the subject

Pancake Day
(focus on recipe maths)



Ratio and Proportion

- Using ratio
- Ratio and proportion
- Solve problems involving proportional reasoning
- Compound units

Exploring angles

- Recap angle facts
- Angles in parallel lines
- Angles in triangles and quadrilaterals

Pi Day
(focus on circles)

π

Patterns & Sequences

- Sequence rules
- Find the nth term
- Use the nth term

Calculating FDP

- Using multipliers
- % change
- % using multipliers
- Increase/decrease by %

Easter competition



Solving equations

- Solve linear equations
- Handling brackets
- Variables on both sides

Area & volume

- Properties of circles
- Calculating area & circumference
- Parts of a circle
- Volume of prisms

Presenting Data

- Interpret grouped frequency tables
- Simple histograms
- Scatter graphs

Straight line graphs

- Plot linear graphs
- Gradients
- $y=mx+c$
- Quadratic graphs

Measuring Data

- Recap averages
- Calculate averages from tables

Revision technique

- Study skills
- Past questions
- Exam technique

GCSE Trial
(foundation or simplified higher)



On to Foundation or Higher



Sports Day

(focus on numeracy and decimals)



Year 9 (Foundation)

Number

Ratio & Proportion

Shape

Algebra

Statistics

Probability



Yr 7



Yr 8



Yr 9



Yr 10



Yr 11

- Inserts/worksheets
- Past paper section
- Tabs in order
- Workings for future revision

Folder standards

Non-Calc recap

- Add, Subtract, Divide, Multiply
- Integers and decimals

Number systems

- Prime factors
- LCM, HCF
- Standard Form
- Rounding to sig fig
- Negative numbers
- Powers and roots

Transformations

- Rotation, reflection and translation
- Describing translations and 2D vectors
- Enlargement

Algebra proficiency

- Fractional coefficients
- Factorising
- Simplifying with indices
- Substituting +/- values
- Changing the subject

Exploring FDP

- Simplifying fractions
- Fractions to decimals
- Converting between fractions and decimals

Probability

- Probability scale
- Listing outcomes
- Venn diagrams
- Possibility spaces
- Theoretical and experimental probabilities

Black Friday % focus

20% OFF

Ratio & proportion

- Dividing according to ratio
- Units of speed
- Rates of pay
- Pricing and best value

Calculating FDP

- 1% values
- % Increase and decrease
- Percentage change
- Using calculators for exact fractions

Angles

- Angles in triangles and quads
- Alternate and corresponding angles
- Problem solving

Patterns & sequences

- Describing rules
- Ascending & descending sequences
- Using nth term

Solving eqns

- Single values of x
- Handling negative numbers
- X's on both sides
- Handling brackets

Area, per. and volume

- Properties of circles
- Composite shapes
- Volume of prisms
- Cylinders
- Converting units

Plotting

- Gradients
- $y = mx + c$
- Quadratic graphs
- Distance-Time and Speed-Time graphs

Presenting data

- Grouped frequency tables
- Interpreting histograms
- Scatter graphs
- Correlation

Measuring data

- Sets of data
- Mode, mean, median, range
- Mean from tables

GCSEs (Foundation)



On to next year



Year 9 (Crossover)

Number

Ratio & Proportion

Shape

Algebra

Statistics

Probability



Yr 7



Yr 8



Yr 9



Yr 10



Yr 11

- Inserts/worksheets
- Past paper section
- Tabs in order
- Workings for future revision

Folder standards

Non-Calc recap

- Add, Subtract, Divide, Multiply
- Integers and decimals

Number systems

- Indices rules/laws
- Roots
- Std Form
- Bounds and error intervals

Construction

- Bisecting lines and angles
- Constructing triangles
- Loci
- Plans & Elevations
- Bearings

Proportion

- Density, speed and pressure
- Direct/inverse graphs
- K calculations
- Speed, distance, time

Deeper Algebra

- Complex brackets
- Difference of 2 squares
- Creating expressions

Black Friday
% focus

20% OFF

Patterns

- Arithmetic and nth term
- Values of any term
- Geometric and Quadratic patterns
- Fibonacci

Pythag

- Hypotenuse
- + & - principles
- Coordinate pythag

- Basic formula
- Parts of circles
- Sector area & perimeter

Circles & Sectors

- Single values of x
- X's on both sides
- Inequalities

Solving eqns

Calculating FDP

- Using multipliers
- Reverse percentage problems
- Simple interest

More Angles

- Polygon rules
- Algebra in shape

Probability

- Simple
- Tree diagrams
- Experimental
- Possibility spaces

Plotting

- Gradients
- $y = mx + c$
- Quadratics
- Cubic

Scatter diagrams

- Correlation
- Lines of best fit
- Analysing
- Outliers

Similar shapes

- Congruence & similarity
- Scale factors & ratio
- Areas & volumes

Real life graphs

- Speed
- Acceleration

Simult. equations

- Creating expressions
- Solving

Stem & leaf

- Mean from tables
- Analysing grouped data
- UQ, LQ and IQR

GCSEs (Higher)



On to Year 10 Higher



Year 9 (Higher)

Number

Ratio & Proportion

Shape

Algebra

Statistics

Probability



Yr 7



Yr 8



Yr 9



Yr 10



Yr 11

- Inserts/worksheets
- Past paper section
- Tabs in order
- Workings for future revision

Folder standards

Non-Calc recap

- Add, Subtract, Divide, Multiply
- Integers and decimals

Number systems

- Indices rules/laws
- Roots
- Std Form
- Bounds and error intervals

Construction

- Bisecting lines and angles
- Constructing triangles
- Loci
- Plans & Elevations
- Bearings

Proportion

- Density, speed and pressure
- Direct/inverse graphs
- K calculations
- Speed, distance, time

Deeper Algebra

- Complex brackets
- Difference of 2 squares
- Creating expressions



Black Friday % focus

20% OFF

Patterns

- Arithmetic and nth term
- Values of any term
- Geometric and Quadratic patterns
- Fibonacci

Pythag

- Hypotenuse
- + & - principles
- Coordinate pythag

- Basic formula
- Parts of circles
- Sector area & perimeter

Circles & Sectors

- Single values of x
- X's on both sides
- Inequalities

Solving eqns

Calculating FDP

- Using multipliers
- Reverse percentage problems
- Simple interest



More Angles

- Polygon rules
- Algebra in shape

Probability

- Simple
- Tree diagrams
- Experimental
- Possibility spaces

Plotting

- Gradients
- $y = mx + c$
- Quadratics
- Cubic



Scatter diagrams

- Correlation
- Lines of best fit
- Analysing
- Outliers

Similar shapes

- Congruence & similarity
- Scale factors & ratio
- Areas & volumes

Real life graphs

- Speed
- Acceleration



Simult. equations

- Creating expressions
- Solving

Stem & leaf

- Mean from tables
- Analysing grouped data
- UQ, LQ and IQR

GCSEs (Higher)



On to Year 10 Higher



Year 10 (Foundation)

Number

Ratio & Proportion

Shape

Algebra

Statistics

Probability

- Add, Subtract, Divide, Multiply
- Integers and decimals
- Rounding and truncating

Non-Calc recap



Yr 7



Yr 8



Yr 9



Yr 10



Yr 11

Using decimals

- Recap angle rules
- Internal angles of polygons

Recap shapes & angles

- Angles in triangles and quads
- Angles in parallel lines
- Angles in polygons
- Algebra in shapes

Indices rules

- Square and cube numbers
- + and – indices
- Standard form
- Using a calculator

Construction & loci

- Bisecting lines and angles
- Loci

Fraction fluency

- Simplifying
- Arithmetic
- Converting formats

Recap algebra

- Collecting terms
- Factorising
- Changing subject

Black Friday
% focus

20% OFF

- One value as % of another
- Compound Interest
- Reverse %

Sequences & patterns

- Term to term rules
- Nth term
- Fibonacci

FDP

- Converting formats
- Problem solving

Ratio & Proportion

- Dividing into parts
- Simplifying
- Best buy
- Recipe ratio

Solving equations

- Linear equations
- Function machines

Probability

- Outcomes
- Venn diagrams
- Relative frequency

Similar shapes

- Side scale factor
- Conditions for congruency

Area & volume

- Perimeter of 2D shapes
- Formulae for area
- 3D volume
- Converting units

Presenting data

- Frequency tables
- Types of data
- Pie charts & line graphs
- Stem & leaf
- Frequency polygons

Scale drawings & bearings

- Ratio/scale
- Measuring and interpreting bearings

Recap Primes

- Product of primes
- HCF and LCM using PoP

Transformations

- Vectors
- Rotation, reflection & enlargement

More percentages

- Using multipliers
- Percentage change

Compound measures

- Speed
- Density
- Rates of pay

Pythag & Trig

- Finding sides and angles

Solving & Inequalities

- Mean from tables

Trial GCSEs
(Foundation)



On to
stage 11 F



Year 11 (Foundation)

Number

Ratio & Proportion

Shape

Algebra

Statistics

Probability

- Add, Subtract, Divide, Multiply
- Integers and decimals

Non-Calc Arithmetic



Yr 7



Yr 8



Yr 9



Yr 10



Yr 11

Circles

- Area/Circum.
- Cylinders
- Multiples of π

Ratio & proportion

- Direct/inverse proportion
- Conversion graphs

Probability

- Tree diagrams
- Combined events
- Venn diagrams

Vectors

- Vector components
- Column notation
- Vector arithmetic & scalars

Measuring data

- Mode, mean and median
- Spread and range
- Grouped & ungrouped data
- Basic sampling

More Algebra

- Solving sim equations
- Quadratics

Trial Papers (Dec)



Everything from here on is flexible on class learning needs



Results Analysis

- WWW
- EBI

Intervention groups

- Period 6 sessions small groups

Pythag & Trig

- Vector components
- Column notation
- Vector arithmetic & scalars

Teach exam technique

- Time management
- Handling diagrams
- Linking subjects together
- Key words

Teach to fill gaps

- Teach/re-teach content

Trial Papers (Feb/Mar)



Results Analysis

- WWW
- EBI

Teach to fill gaps

- Teach/re-teach content

Revision

- Personal revision guide issued T- 8 weeks

Teach to fill gaps

- Teach/re-teach content

Intervention groups

- Period 6 sessions all students
- Easter revision

GCSEs (Foundation)



Early summer





Year 10 (Higher)

Number

Ratio & Proportion

Shape

Algebra

Statistics

Probability



Yr 7



Yr 8



Yr 9



Yr 10



Yr 11

Folder standards

- Inserts/worksheets
- Past paper section
- Tabs in order

Non-Calc recap

- Add, Subtract, Divide, Multiply
- Integers and decimals

Advanced Trig

- Pythag & Trig recap
- Sine/Cosine rule
- Area of scalene triangles
- Exact trig values
- Bearings

More numbers

- Fractional indices
- Negative indices
- Surds
- Bounds & error intervals

Sim equations

- Solving simple and hard linear pairs
- Creating expressions

Iteration

- Solution between values
- Iteration formula

Black Friday
% focus

20% OFF

Transformations

- Translation
- Rotation
- Reflection
- Enlargement

More Algebra

- Factorising quadratics
- Algebraic fractions

Proportion

- Direct & inverse proportion
- K values
- Speed
- Density

Inequality regions

- Drawing and interpreting
- Solid and dashed lines

nth term sequences

- Arith + geo sequences
- Quadratic nth term
- Finding specific terms

Volume & s. area

- Cones, pyramids
- Spheres
- Frustums

Real life graphs

- Non-standard functions
- $y = mx + c$
- Gradients & tangents
- Velocity time graphs

Recurring decimals

- Converting
- 'over 9s'
- Proofs

Quadratics

- Solving types of quadratics
- Roots and turning points
- Parabola

Circle Theorems

- Common
- Unfamiliar
- Proofs

Probability

- Venn diagrams
- Set notation
- Two way tables

Analysing stats

- Sampling
- IQR
- Cumulative freq

GCSEs (Higher)



On to stage
11 H



Year 11 (Higher)

Number

Ratio & Proportion

Shape

Algebra

Statistics

Probability



Yr 7



Yr 8



Yr 9



Yr 10



Yr 11

- Inserts/worksheets
- Past paper section
- Tabs in order

Folder standards

Non-Calc Arithmetic

- Add, Subtract, Divide, Multiply
- Integers and decimals

Algebra in shapes

- Finding sides and angles
- Solving
- Algebraic graphs

Surds

- Teach/re-teach content

Functions

- $F(x)$
- Compound and inverse functions

Advanced Pythag & Trig

- 3D sides and angles

Complex inequalities

- Solving challenging algebra
- Quadratic formula

Vectors

- Analysing vectors
- Vector proof

Results analysis

- Envelope experience
- WWW/EBI

Advanced graphs

- Inverse, Trig and exponential graphs

Trial Papers (Dec)

Recap exam technique

- Practice habits

Teach to fill gaps

- Teach/re-teach content

Group intervention

- Period 6
- RFL



Everything from here on is flexible on class learning needs

Trial Papers (Feb/Mar)

Results Analysis

- WWW
- EBI

Teach to fill gaps

- Teach/re-teach content

Revision

- Personal revision guide issued T-8 weeks

Teach to fill gaps

- Teach/re-teach content

Intervention groups in holidays

- Easter revision sessions

GCSEs (Higher)



Bridging work to year 12



Year 1 – A Level Maths

PURE + STATISTICS + MECHANICS

Folder standards



Yr 12



Yr 13

- Inserts/worksheets
- Past paper section
- Tabs in order

- Rearranging formulae
- Completing the square

Solving equations

Sampling Methods

- Collecting data
- Measures of spread
- Averages

- Solving and factorising
- Inequalities

Indices & surds

Data presentation

- Advanced graphs
- Histograms
- Single variable data
- Bivariate data

Distributions

- Probability
- Binomial distribution

Polynomials

- Advanced algebra and graphs
- Algebraic division
- Binomial
- Curve sketching
- Argument and proof

Hypothesis testing

- Formulating a test
- Critical region

Lines and circles

- Equations
- Inequalities

Vectors

- Definitions and properties
- Components of vectors
- Parallel and collinear proof

Calculus

- Differentiation
- Leibniz
- Rates of change
- Tangents and normal
- Integration

Kinematics

- Motion in a straight line
- Definitions and graphs
- Equations of motion
- Variable acceleration

Trigonometry

- Sin, Cos, Tan
- Graphs and rules

Forces and laws

- Newton's laws
- Dynamics
- Motion under gravity
- Systems of forces

Logs

- Laws of logs
- Exponential functions and processes
- Curve fitting

AS Trial Paper

On to year 13



Year 2 – A Level Maths

PURE + STATISTICS + MECHANICS

Folder standards



Yr 12



Yr 13

- Recap factor theorem
- Algebraic division
- Partial Fractions

Advanced Algebra

Modelling probability

- Conditional probability
- Modelling

Advanced Trig

- Radians
- Reciprocal and inverse trig functions
- Compound angles
- Equivalent forms

Statistical distribution

- Normal distribution
- Approximating the binomial using standardised normal distribution

Further calculus

- Shapes of functions
- Exponential and log functions
- Product, quotient and chain rules
- Inverse functions
- Rates of change
- Integration by parts and substitution

Hypothesis testing

- Testing correlation
- Testing the normal distribution

Parametric Equations

- Cartesian form
- Differentiating parametrics

Motion in 2 dimensions

- Constant and variable acceleration
- Motion under gravity
- Motion under forces

Sequences and series

- Arithmetic and geometric
- Binomial series
- Sums to infinity

Kinematics

- 3D vectors
- Equilibrium and resolving

Numerical methods

- Root finding
- Newton-Raphson
- Trapezium rule

Forces and laws

- Statics
- Lami
- Dynamics
- Turning moments

REVISION

A Level Exams





Year 1 - Further Maths

PURE + STATISTICS + MECHANICS

Folder standards

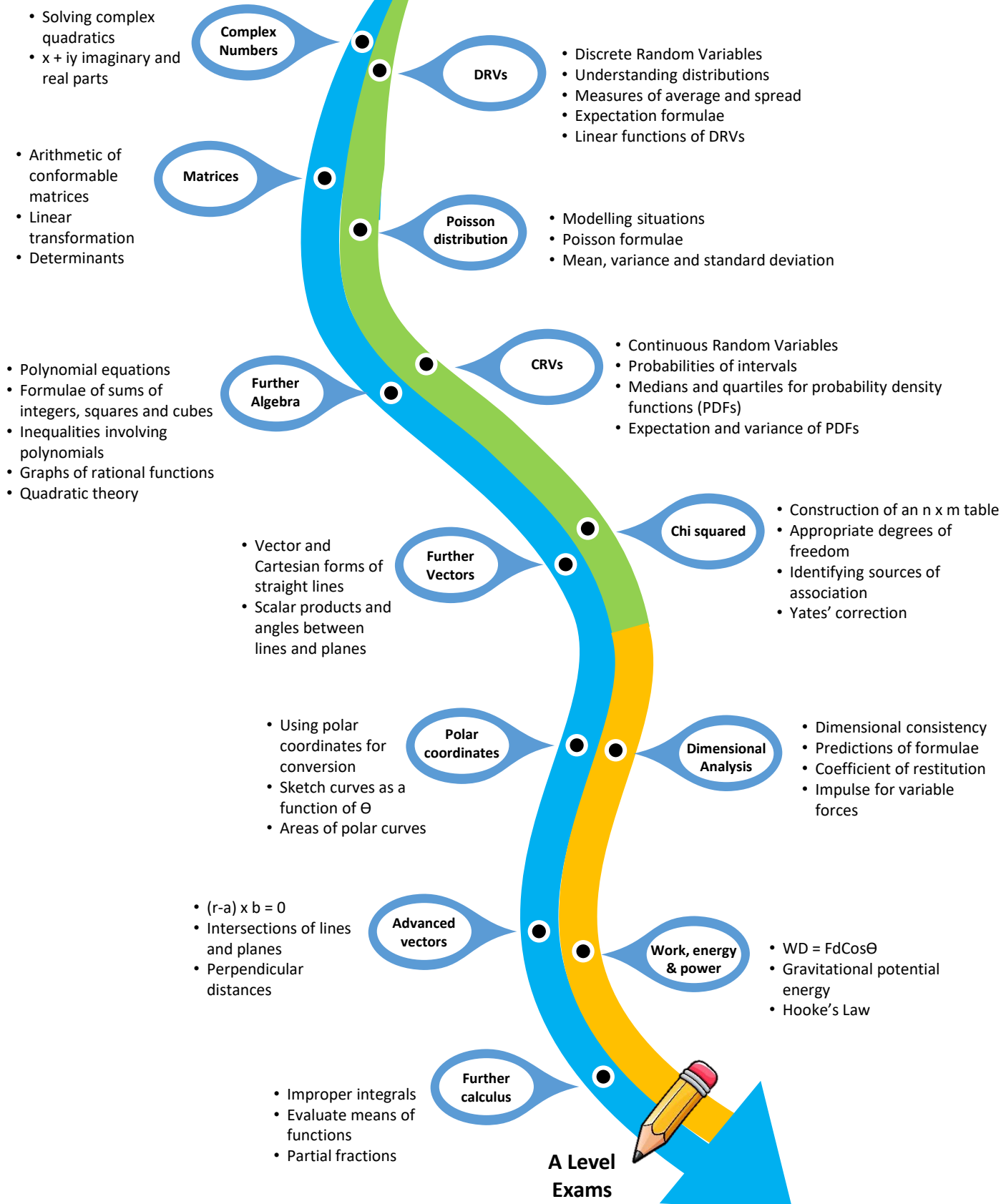


Yr 12



Yr 13

- Inserts/worksheets
- Past paper section
- Tabs in order





L3 Mathematical Studies

With Critical Path option

- Inserts/worksheets
- Past paper section
- Tabs in order

Folder standards

Yr 12

