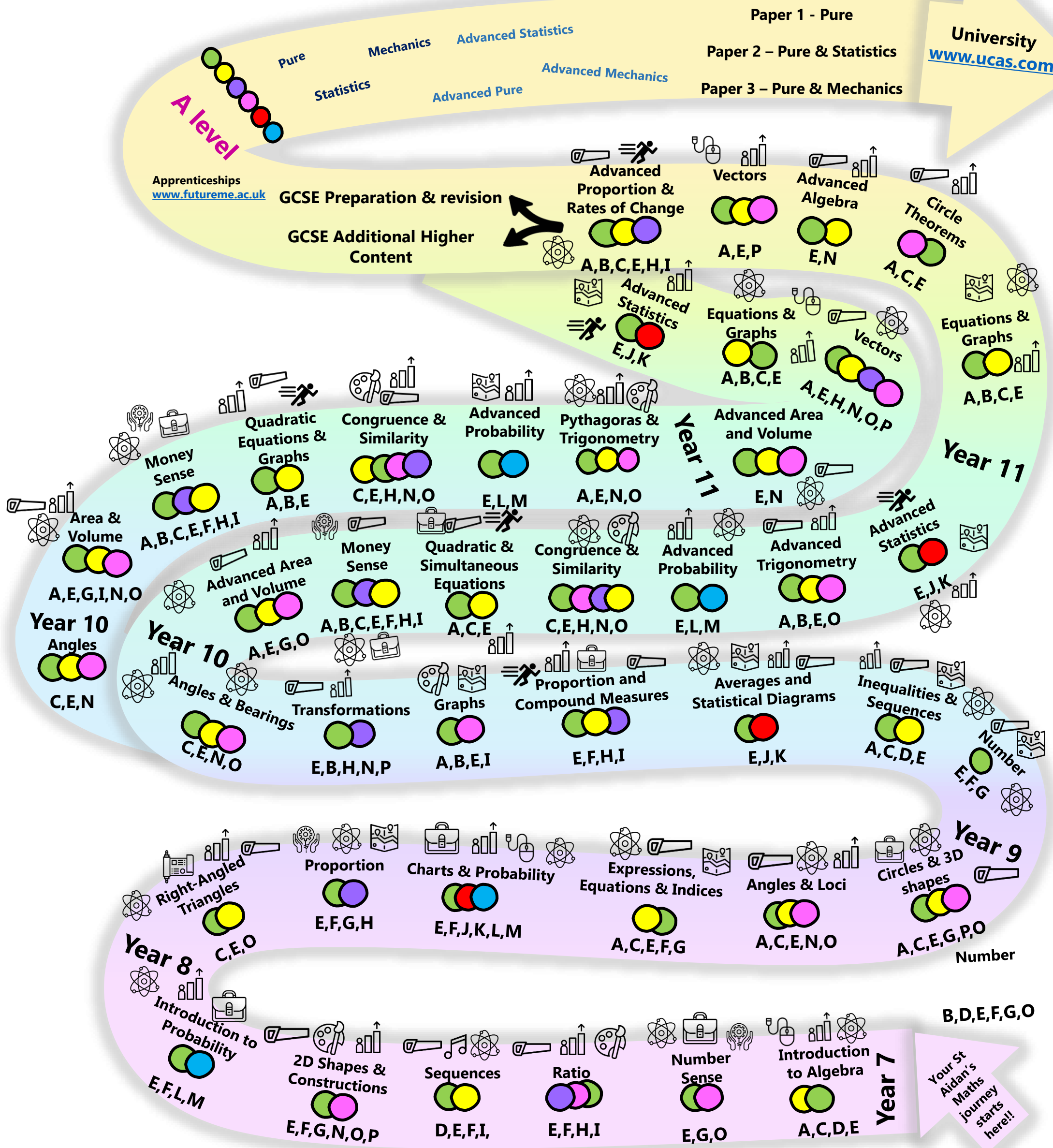


Maths Learning Journey

"Mathematics is, in its way, the poetry of logical ideas." – Albert Einstein



Key Concepts:	
	Number
	Algebra
	Data handling
	Probability
	Ratio & Proportion
	Geometry & Measures

Sub Concepts:	
A	Notation, vocabulary & manipulation
B	Graphs
C	Equations & Inequalities
D	Sequences
E	Structure & Calculation
F	Fractions, decimals & percentages
G	Measures & Accuracy
H	Ratio & Proportion
I	Rates of change
J	Measures of location & dispersion
K	Collecting, representing & interpreting data
L	Calculations
M	Diagrams & Tables
N	Properties & Construction
O	Mensuration & calculation
P	Vectors

NC Skills	
1	Mathematical Fluency
2	Reason Mathematically
3	Solve problems

Read like a Mathematician	
50 Mathematical Ideas You Really Need To Know	Why do busses come in threes?
How long is a piece of string?	Can You Solve My Problems?
Alex's Adventures in Numberland	The Indisputable Existence of Santa Claus
	How Many Socks Make a Pair?
	The Liar Paradox & The Towers of Hanoi
	Maths Magic & Mystery
	The Great Mathematical Problems

Maths Careers	
Engineer	Software engineer
Accountant	Statistician
Economist	Astronomer
Pharmacist	Investment analyst
Actuary	Meteorologist
Data analyst	Financial trader

Curriculum Links			
	Science		MFL
	English		ICT
	P.E/ Sport		RE
	Geography		Careers
	Art		PHSE/ Citizenship
	DT/ Engineering		History
	Music		Enterprise

Your St Aidan's Maths journey starts here!!

Math's Learning Journey

"The Laws of nature are written by the hand of God in the language of mathematics."
Galileo Galilei



Math's Narrative The 7 Year Journey

Math's can be seen all around us; it is not only taught in the classroom it can be seen in every aspect of our lives. Without realizing it, we use mathematical concepts alongside the skills we learn from doing math's problems every day. Just as languages provide the building blocks and rules that allow us to communicate, math's uses its own language. This is made up of numbers, symbols and formulae and allows us to explore the rules we need to measure or identify essential problems, such as speed, distance, time, space and force. It also allows us to put a price on things, create graphics and understand how things work. We can even use it to predict how things may change over time and under different conditions. By studying and applying math's we can find patterns and structure in our lives.

Throughout the study of Maths at St Aidan's the following essential skills are developed:

- 1) Problem solving skills – the skills learnt in the classroom can be applied in other subjects and real life.
- 2) Analytical thinking – break down a problem, look at the possible solutions and conclude which will be the most logical.
- 3) Time management – appreciate and value time, whether at home or school.
- 4) Critical Thinking – developing a model as an approach to problem solving.
- 5) Quantitative reasoning – applying basic mathematical skills to information to draw conclusions.
- 6) Construct logical arguments – using the language of maths to prove or disprove a theory.

From **Year 7** onwards all skills and knowledge from KS2 are consolidated, built upon and extended. Data from KS2 is analysed and our curriculum is adjusted to reflect the knowledge gaps identified. Pupils are offered varied and frequent practice problems that become more complex over time, ensuring they gain deep subject knowledge and understanding. Having good conceptual knowledge, that they can recall and apply will allow them to reason, problem solve, identify relationships, make conjectures and solve a variety of problems by applying their knowledge to both familiar and unfamiliar contexts. The curriculum begins with an introduction to Algebra, developing an understanding of how letters can be used to represent unknown values and correct algebraic notation for expressions and equations. They then move onto Number Sense, consolidating and strengthening their knowledge and application of Calculations and Structure. This is followed by ratios, whereby pupils develop a deep understanding of their equivalents and how to perform calculations. Moving on then to Sequences, an appreciation of how patterns can be identified and used to solve problems. They then delve into Shape Properties, and they conclude the year with a look at Probability, understanding how different factors can alter the chance of an event occurring.

The Journey in **Year 8** starts with right angled triangle, looking at two key concepts, Pythagoras' Theorem and Trigonometry, both are key foundational concepts. They then move into proportion, linking back to ratio, pupils explore how quantities within problems relate to each other, using these links to convert recipes and identify best buys in a supermarket amongst other real-life skills. Our next focus is Charts and Probability, developing a deep understanding of different representations allows pupils to analyse, interpret and represent data in a variety of formats and use the data to understand the world of chance and predict how often an event may occur. From this we then strengthen their understanding of algebra and its application by learning about how to use and apply expressions and equations to solve problems and understand the rules of indices. Towards the end of their year 8 journey pupils discover all about angles, they will look further into the properties of different polygons and explore the various angle rules that will allow them to fully grasp and solve multistep geometry problems. Building upon this they meet circles and 3D shapes; discovering how pi is used to find the circumference and area of a circle and how to calculate volume.

Year 9 begins by refocusing on number skills, enhancing their previous knowledge and refining their skills, from this they move onto more in-depth algebra skills, using the knowledge gained in year 8 they look at how they are applied to inequalities and more complex sequences. Next, they will move on to developing their analytical skills as they look further into the methods of Averages and Statistical diagrams which they were introduced to in year 8. This is followed by revisiting proportion and building upon this knowledge with the introduction of compound Measures. Their next step is to be introduced to the various types of graphs, they will learn how to both draw the graphs and how to distinguish and describe each one using key features. This skill of describing key features will then be applied further in the next concept of transformations where they will gain the expertise of both completing and describing enlargements, rotations, reflections and translations. Finally, they move onto expanding their knowledge of angles facts and are introduced to Bearings, applying this new knowledge to problems that are much more complex and diverse.

Year 10 pupils embark on their journey through KS4 following slightly different pathways of either higher or intermediate. The intermediate pathway ensures that pupils have access to all foundation and accessible higher concepts, allowing tier of entry decisions to be left until year 11. Throughout the year pupils build upon the knowledge and skills acquired throughout KS3 to access more complex algebra, geometry and probability concepts. Pupils are regularly challenged to apply their knowledge and skills to problem solving scenarios to help develop a deeper understanding and support the recognition of links between concepts. Pupils are exposed to GCSE exam questions in lessons and assessments throughout the year which allows pupils to become familiar with their format and how they should be approached.

Year 11 begins by completing the final elements of knowledge the pupils require. During this final element of their Maths journey pupils from the intermediate pathway will either move into the advanced knowledge required to sit the higher paper or develop and consolidate their understanding in preparation for the exam. Through revision pupils will revisit concepts from previous years and enhance their ability to give full, complete worked solutions to exam questions, pupils will also begin fine-tuning their revision strategies to ensure success in their exams.

Year 12 and Year 13 St Aidan's pupils will be able to confidently approach pure, mechanics and statistics at A-Level due to the foundations that have been laid at KS3 and KS4. pupils will have been given the skills and knowledge needed to fully access the complexity of A-Level maths and they will build upon each of the various strands looking in greater depth at each and understanding mathematical proofs.

Maths Assessment Map:

Year /Cycle	Concept:	Curriculum assessed:	Assessment Type
Year 7 Cycle 1	Introduction to Algebra	Using letters, simplifying expressions	Formative
		Expressions, Notation and Equations	Summative
		Practical Applications of Algebra	Extended Writing
	Number Sense	Powers of 10, Rounding, Estimation, Standard Form, Factors, Multiples and Primes	Formative
		Negative Numbers, Fractions and Percentages	Summative
Year 7 Cycle 2	Ratio	Simplifying Ratios and Dividing into a Quantity	Formative
		Ratio Problems and Ratio in other forms	Summative
		History of the golden ratio	Extended Writing
	Sequences	Linear and non linear Sequences – Graphing Sequences	Formative
		Sequences and nth term	Summative
Year 7 Cycle 3	2D shapes and Constructions	Angles and line Segments, Triangles, Quadrilaterals and Polygons	Formative
		Properties of Shapes and Constructions	Summative
	Probability	Calculating Probability	Formative
		Probability of events and problem solving	Summative
		What's the Chance	Extended Writing

Maths Assessment Map:

Year /Cycle	Concept:	Curriculum assessed:	Assessment Type
Year 8 Cycle 1	Right Angled Triangles	Pythagoras Theorem	Formative
		Trigonometry	Summative
		Mathematical Theories	Extended Writing
	Proportion	Direct and Inverse Proportion	Formative
		Using Proportion and Speed	Summative
Year 8 Cycle 2	Charts and Probability	Averages, Tables and Charts	Formative
		Interpreting and Representing Data and Probability	Summative
	Expressions, Equations and Indices	Substitution and Expressions	Formative
		Solving Equations and Index Laws	Summative
		Uses of Algebra - Coding	Extended Writing
Year 8 Cycle 3	Geometry	Angles in Parallel Lines and Polygons	Formative
		Angles and Constructions	Summative
		The Mathematics of Football	Extended Writing
		Circumference and Area of a Circle	Formative
		Volume and Surface Area	Summative

Year /Cycle	Concept:	Curriculum assessed:	Assessment Type
Year 9 Cycle 1	Number	Working with Numbers – Negatives, Rounding, Estimation	Formative
		Indices, Standard Form and Surds	Summative
	Algebra	Representing and Solving Equations and Inequalities	Formative
		Sequences and Problem Solving	Summative
		Linear Equations	Extended Writing
Year 9 Cycle 2	Averages and Statistical Diagrams	Averages and Charts	Formative
		Stem and Leaf, Scatter Graphs and Cumulative Frequency	Summative
		Interpreting and Representing Data	Extended Writing
	Proportion & Compound Measure	Direct and Inverse Proportion	Formative
		Speed, Density and Rates	Summative
	Graphs	Plotting linear graphs, equation of a straight line	Formative
		Quadratics and other graphs	Summative
Year 9 Cycle 3	Trans- formations	Translations, Reflections and Rotations	Formative
		Combined Transformations and Enlargements	Summative
	Angles and Bearings	Angles in polygons and problem solving	Formative
		Angles and Bearings	Summative
		Mathematical Theories	Extended Writing

Year /Cycle	Concept:	Curriculum assessed:	Assessment Type
Year 10I Cycle 1	Area & Volume	Perimeter, area and volume (triangles, trapezia, prisms).	Formative
		Area/circumference of circles and area/arc length of sectors.	Formative
		Bounds, area, perimeter, circles, volume, surface area and compound measures.	Summative
	Money Sense	Percentages, interest, exchange rates.	Summative
Year 10H Cycle 1	Advanced Area & Volume	Bounds, area, perimeter, circles (including sectors).	Formative
		Bounds, area, perimeter, circles, volume, surface area and compound measures.	Summative
	Money Sense	Percentages, interest, exchange rates.	Summative
Year 10I Cycle 2	Quadratic Equations & Graphs	Quadratic graphs – drawing and interpreting.	Formative
		Quadratics – drawing, interpreting, factorising expanding and solving.	Summative
	Congruence & Similarity	Similarity, congruence and transformations.	Formative
Year 10H Cycle 2	Quadratic & Simultaneous Equations	Quadratics – factorising, expanding, solving, quadratic formula and completing the square.	Formative
		Quadratics and simultaneous Equations (algebraically).	Summative
	Congruence & Similarity	Similarity, congruence and transformations.	Formative
	Advanced Probability	Probability calculations.	Formative
		Probability calculations, tree and Venn Diagrams	Summative
Year 10I Cycle 3	Advanced Probability	Probability calculations.	Formative
		Probability calculations, tree and Venn Diagrams	Summative
	Pythagoras and Trigonometry	Pythagoras' Theorem.	Formative
		Pythagoras' Theorem and right-angled Trigonometry	Summative
	All	Year 10 Mock	Summative
Year 10H Cycle 3	Advanced Trigonometry	Bounds with trigonometry, trigonometric graphs and area of a triangle.	Formative
		Bounds with trigonometry, trigonometric graphs, area of a triangle, sine and cosine rule.	Summative
	Advanced Statistics	Box plots, cumulative frequency and comparing distributions.	Formative
		Box plots, cumulative frequency, comparing distributions and histograms.	Summative
	All	Year 10 Mock	Summative

Year /Cycle	Concept:	Curriculum assessed:	Assessment Type
Year 11I Cycle 1	Advanced Area & Volume	Circles – area, perimeter and sectors.	Formative
		Circles, surface area and volume (cylinders, spheres, pyramids, cones).	Summative
	Vectors	Drawing, writing and calculating with vectors.	Formative
Year 11H Cycle 1	Equations & Graphs	Quadratic graphs, simultaneous equations and inequalities (graphically).	Formative
		Quadratic graphs, simultaneous equations, inequalities, cubic graphs and iterations.	Summative
	Circle Theorems	Theorems, finding angles, proofs and equations of tangents.	Formative
Year 11H Cycle 2	Advanced Algebra	Formulae and algebraic fractions.	Formative
		Algebraic fractions, functions, surds, proof and formulae.	Summative
	Vectors	Writing, drawing and geometrical problems with vectors.	Formative
	Advances Proportion & Rates of Change	Rates of change (graphs) and non-linear graphs.	Formative
		Rates of change (graphs), non-linear graphs and proportion.	Summative
Year 11I Cycle 2	Equations and Graphs	Drawing and interpreting non-linear graphs.	Formative
		Graphs and simultaneous equations.	Summative
	Advanced Statistics	Averages from frequency tables.	Formative
		Averages, drawing and interpreting statistical diagrams/graphs.	Summative
Year 11	GCSE Preparation	GCSE preparation & revision.	
		Past Papers	
		Mock Examinations	Summative