

How to Use these Sheets

The sheets contained in this document are intended to help you focus your intervention programme.

This Document contains:

- 1 - This sheet of 'Instructions'
- 2 - Student Tracker
- 3 - Teacher Tracker

The PiXL Process

At the heart of the PiXL process is the concept of **DIAGNOSIS - THERAPY - TESTING**.

If **DIAGNOSIS** is thorough and systematic then we are much more likely to be effective in targeting intervention, **THERAPY**, according to identified need, rather than relying upon a series of general revision sessions. It is crucial that objective **TESTING** takes place following interventions to confirm that what was a learning insecurity has been converted into a learning security.

This **PERSONALISED LEARNING CHECKLIST** will enable you to conduct a thorough and systematic **DIAGNOSIS** for your remaining target students according to their target status:

The diagnostic judgement results in 1 of 3 conclusions:

- An individual student is **'Secure'** in this topic. 'Secure' means they can recall this knowledge or skill: score 80% +
- A student is **'Insecure'** in this topic. 'Insecure' meaning that they have some grasp of the topic between 50% & 79%
- A student has **'No Understanding'** of this topic, meaning that they are scoring less than 50% and therefore cannot demonstrate secure understanding of that topic

The sheets contained in this document are **conditionally formatted**. Therefore, if you enter a **'1' for 'Secure', the cell will turn Green**; enter a **'2' for 'Insecure' and the cell will turn Yellow**. Enter a **'3' for 'No Recall' and the cell will turn Red**.

This exercise will identify two vital elements which will enable you to target intervention with laser precision:

- The specific individual learning needs of each student in the target group which can be addressed through small group intervention
- The topics which need to be taught to whole groups. This may be because they have yet to be taught or because they have been taught but not learned.

Testing (**Diagnosis**) should be regular and systematic:

- Knowledge tests**
- Recall questions at the start or end of the lesson**
- Short topic tests**

The emphasis will be on carefully **PLANNING** opportunities for testing throughout the lessons followed by systematic intervention.

How to Use these sheets

- 1 - Enter student names and target grades into the Teacher Tracker sheet
- 2 - Enter topic and knowledge into the Student Tracker - these will automatically feed into your Teacher Tracker Sheet



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER					
Unit of Work:						
Topic	Knowledge	RAG				
Number	Calculate the number of ways to perform a task					
	Round numbers to 1, 2 & 3 significant figures					
	Use rounding to estimate calculations					
	Write a number as a product of it's prime factors					
	Use prime factor decomposition to find HCF & LCM					
	Use a calculator efficiently including roots & indices					
	Use negative & fractional indices					
	Convert between real numbers and standard form					
	Calculate with numbers in standard form					
	Simplify a surd					
	Rationalise a denominator					



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER					
Unit of Work:						
Topic	Knowledge	RAG				
Algebra	Apply laws of indices					
	Expand single brackets & collect terms					
	Factorise an expression to a single bracket					
	Solve equations - unknown on one side incl brackets					
	Solve equations - unknown on both sides incl brackets					
	Form and solve equations					
	Solve equations involving fractions					
	Substitute into formulae					
	Change the subject of a formula					
	Find & use the nth term of a linear sequence					
	Find the nth term of a quadratic sequence					
	Expand a pair of brackets					
Factorise a quadratic expression						



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER					
Unit of Work:						
Topic	Knowledge	RAG				
Interpreting & representing Data	Construct & interpret stem & leaf diagrams incl back to back					
	Construct & interpret frequency polygons					
	Construct & interpret pie charts					
	Plot & interpret time series graphs					
	Plot & interpret scatter graphs					
	Calculate and solve problems involving averages & range from a discrete data set					
	Calculate averages from frequency tables					
	Estimate averages from grouped data					
	Construct & use two way tables					
	Choose appropriate diagrams & recognise misleading graphs					



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER					
Unit of Work:						
Topic	Knowledge	RAG				
Fractions & Percentages	Add & subtract fractions with different denominators					
	Multiply fractions					
	Divide fractions					
	Apply all operations to mixed numbers					
	Find the reciprocal of a number					
	Write a ratio in the form 1:n					
	Share a quantity in a given ratio					
	Solve problems involving ratio					
	Convert between currencies & measures					
	Solve problems involving proportion					
	Calculate any % of an amount - with and without a calculator					
	Calculate a % change					
	Convert between fractions, decimals & %s					
	Write a recurring decimal as a fraction					

Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER					
Unit of Work:						
Topic	Knowledge	RAG				
Angles & Trigonometry	Know & use the sum of angles in triangles & quadrilaterals					
	Solve problems with angles on parallel lines					
	Calculate interior / exterior angles of polygons					
	Use interior / exterior angle facts to solve problems involving polygons					
	Use Pythagoras to calculate lengths of right angled triangles					
	Use Pythagoras to solve more complex problems including in context					
	Use trigonometry to calculate missing lengths & angles in a right angled triangle					
	Use trigonometry to solve more complex problems including in context					



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER					
Unit of Work:						
Topic	Knowledge	RAG				
Graphs	Plot the graph of a linear function					
	Find the equation of a given linear line					
	Re-arrange an equation into the form $y=mx+c$ & find the gradient & y intercept					
	Draw & interpret distance-time graphs					
	Understand and make calculations of acceleration & distance from velocity-time graphs					
	Solve problems involving real life graphs including interpretation of the gradient					
	Find the gradient of a line segment					
	Find the midpoint of a line segment					
	Find the length of a line segment					
	Find the equation of a line segment given two points					
	Construct graphs of quadratic functions					
	Construct graphs of cubic functions					
	Construct graphs of reciprocal functions					
	Interpret linear & non linear real life graphs					
	Draw the graph of a circle					



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER					
Unit of Work:						
Topic	Knowledge	RAG				
Area & Volume	Calculate area of compound shapes					
	Calculate perimeter of compound shapes					
	Use the formula for the area of a trapezium					
	Convert between metric units of area & volume					
	Write the error bounds of a measurement					
	Calculate the area of circles - incl in terms of pi					
	Calculate the circumference of circles - incl in terms of pi					
	Calculate area and arc length of sectors					
	Solve problems involving sectors incl finding missing angles					
	Calculate volumes of prisms					
	Calculate the surface area of prisms					
	Calculate the volume of a cylinder					
	Calculate the surface area of a cylinder					
	Calculate volume and surface area of spheres & hemispheres					
	Calculate volume & surface area of cones and pyramids incl frustrums					
	Solve problems involving volume & surface area					
Solve problems involving segments of circles						



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER					
Unit of Work:						
Topic	Knowledge	RAG				
Transformations & Constructions	Draw plans & elevations of 3D solids					
	Reflect a shape & describe a reflection					
	Rotate a shape & describe a rotation					
	Translate a shape & describe a translation using a vector					
	Enlarge a shape with a +ve scale factor & describe an					
	Enlarge a shape with a -ve scale factor & describe an					
	Combine transformations					
	Solve problems involving bearings					
	Construct triangles given SAS, ASA & SSS					
	Construct the perpendicular bisector					
	Construct an angle bisector					
	Construct the shortest distance to a line from a point					
	Construct angles using ruler & compass					
Use loci to solve problems						



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER					
Unit of Work:						
Topic	Knowledge	RAG				
Equations & Inequalities	Solve quadratic equations by factorising					
	Solve quadratic equations using the formula					
	Solve quadratics by completing the square					
	Solve linear simultaneous equations					
	Solve linear & quadratic simultaneous equations					
	Show and interpret linear inequalities on a number line					
	Solve linear inequalities					



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER						
Unit of Work:							
Topic	Knowledge	RAG					
Probability	List outcomes of events in a sample space diagram & interpret to calculate probability						
	Solve problems involving mutually exclusive events						
	Compare theoretical & experimental probabilities						
	Construct & use probability tree diagrams						
	Construct & use probability tree diagrams for conditional probability						
	Use Venn diagrams to calculate probability & use set notation						



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER					
Unit of Work:						
Topic	Knowledge	RAG				
Multiplicative Reasoning	Calculate outcomes using compound interest & depreciation					
	Solve problems involving growth & decay					
	Solve problems involving speed & acceleration					
	Convert between metric speed measures					
	Solve problems involving density					
	Solve problems involving pressure					
	Solve problems involving direct proportion					
	Solve problems involving inverse proportion					



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER					
Unit of Work:						
Topic	Knowledge	RAG				
Similarity & Congruence	Prove that triangles are congruent using SSS, SAS & ASA					
	Show that triangles with AAA are similar					
	Calculate missing lengths of similar shapes					
	Solve problems involving similar shapes					
	Solve problems involving similar solids for area and volume					



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER						
Unit of Work:							
Topic	Knowledge	RAG					
Further Trigonometry	Prove exact values of sine, cos & tan for 30° , 45° & 60°						
	Know & apply the graph of the sine function to solve problems						
	Know & apply the graph of the cosine function to solve problems						
	Know & apply the graph of the tangent function to solve problems						
	Use trigonometry to calculate the area of a triangle						
	Use the sine rule to solve problems						
	Use the cosine rule to solve problems						
	Use Pythagoras in 3D to solve problems						
	Use Trigonometry in 3D to solve problems						
	Recognise how transformations in a function effect trigonometric graphs						



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER					
Unit of Work:						
Topic	Knowledge	RAG				
Further Statistics	Understand sampling					
	Take a stratified sample					
	Construct & interpret cumulative frequency diagrams					
	Construct & interpret box plots					
	Construct & interpret histograms					
	Compare sets of data					



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER						
Unit of Work:							
Topic	Knowledge	RAG					
Equations & Graphs	Solve simultaneous equations graphically						
	Represent inequalities on graphs						
	Interpret regions of inequalities						
	Recognise & draw quadratic functions						
	Solving quadratic functions graphically						
	Sketch & find roots of cubic functions						
	Solve cubic equations using an iterative process						



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER						
Unit of Work:							
Topic	Knowledge	RAG					
Circle Theorems	Solve problems involving triangles, angles & circles						
	Understand & use facts about tangents						
	Solve problems involving circle theorems including: angle subtended at centre is double at the edge; angle in a semi circle is 90° ; angles in the same sector are equal and opposite angles in a cyclic quadrilateral sum to 180°						
	Solve problems involving the alternate segment theorem						
	Find the equation of a tangent to a circle at a given point						



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER					
Unit of Work:						
Topic	Knowledge	RAG				
Further Algebra	Re-arrange complex formulae					
	Add & subtract algebraic fractions					
	Multiply Algebraic fractions					
	Divide Algebraic fractions					
	Simplify Algebraic fractions					
	Simplify expressions involving surds					
	Expand expressions involving surds					
	Rationalise the denominator of a fraction					
	Solve equations that involve algebraic fractions					
	Use function notation					
	Find composite functions					
	Find inverse functions					
	Prove a result using algebra					



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER					
Unit of Work:						
Topic	Knowledge	RAG				
Vectors & Geometric proof	Understand & use vector notation					
	Work out the magnitude of a vector					
	Calculate the resultant of two vectors					
	Solve geometric problems involving vectors					
	Express points as position vectors					
	Prove lines are parallel					
	Prove points are collinear					
	Apply vector methods for simple geometric proofs					



Personalised Learning Checklist

Course and Examining Board:	GCSE EDEXCEL MATHEMATICS - HIGHER TIER						
Unit of Work:							
Topic	Knowledge	RAG					
Proportion & Graphs	Write & use equations to solve problems involving direct proportion						
	Solve problems involving square & cubic proportionality						
	Write & use equations to solve problems involving inverse proportion						
	Use & recognise graphs showing inverse proportion						
	Recognise & sketch graphs of exponential functions						
	Calculate the gradient of a tangent at a point to a graph						
	Estimate the area under a non linear graph						
	Understand the relationship between translating a graph & the change in it's function notation						
	Reflect & stretch graphs						

