1 Mathematical Processes and Applications

	Outcome	4a F	5c E	5b E	5a E	6c D	6b D	6a D	7c C	7b C	7a B	8c B	8b A	8a A	EP A*
1.1	Representing	Identify the necessary information to understand or simplify a context or problem.	Represent problems, making correct use of symbols, words, diagrams, tables and graphs	Use appropriate procedures and tools, including ICT	Identify the mathematical features of a context or problem,	Try out and compare mathematical representations.	Select appropriate procedures and tools, including ICT.	Break down substantial tasks to make them more manageable.	Represent problems and synthesise information in algebraic, geometrical or graphical form.	Move from one form to another to gain a different perspective on the problem.	Compare and evaluate representations	Explain the features selected and justify the choice of representation in relation to the context	Choose and combine representations from a range of perspectives	Introduce and use a range of mathematical techniques, the most efficient for analysis and most effective for communication	Systematically model contexts or problems through precise and consistent use of symbols and representations, and sustain this throughout the work
1.2	Analysing - use mathematical reasoning	Classify and visualise properties and patterns	generalise in simple cases by working logically; draw simple conclusions and explain reasoning	understand the significance of a counter-example; take account of feedback and learn from mistakes	visualise and manipulate dynamic images; conjecture and generalise	Move between the general and the particular to test the logic of an argument.	identify exceptional cases or counter examples; make connections with related contexts	Use connections with related contexts to improve the analysis of a situation or problem.	Pose questions and make convincing arguments to justufy generalisations or solutions.	Recognise the impact of constraints or assumptions.	Identify a range of strategies and appreciate that more than one approach may be necessary.	explore the effects of varying values and look for invariance and covariance in models and representations; examine and refine arguments, conclusions and generalisations	produce simple proofs	make progress by exploring mathematical tasks, developing and following alternative approaches; examine and extend generalisations; support assumptions by clear argument and follow through a sustained chain of reasoning, including proof	present rigorous and sustained arguments; reason inductively, deduce and prove; explain and justify assumptions and constraints
1.3	Analysing - use appropriate mathematical procedures	make accurate mathematical diagrams, graphs and constructions on paper and on screen; calculate accurately, selecting mental methods or calculating devices as appropriate; manipulate numbers, algebraic expressions and equations, and apply routine algorithms; use accurate notation, including correct syntax when using ICT; record methods, solutions and conclusions; estimate, approximate and check working													
1.4	Interpreting and evaluating	Interpret information from a mathematical representation or context.	relate findings to the original context; check the accuracy of the solution	explain and justify methods and conclusions; compare and evaluate approaches	Use logical argument to interpret the mathematics in a given context or to establish the truth of a statement.	Give accurate solutions appropriate to the context or problem.	Evaluate the efficiency of alternative strategies and approaches.	Justify the mathematical features drawn from a context and the choice of approach.	Generate fuller solutions by presenting a concise, reasoned argument using sumbols, diagrams, graphs and related explanations.	Make sense of, and judge the value of, own findings and those presented by others.	Judge the strength of empirical evidence and distinguish between evidence and proof.	Justify generalisations, arguments or solutions.	show insight into the mathematical connections in the context or problem; critically examine strategies adopted and arguments presented	Consider the assumptions in the model and recognise limitations in the accuracy of results and conclusions.	justify and explain solutions to problems involving an unfamiliar context or a number of features or variables; comment constructively on reasoning, logic, process, results and conclusions
1.5	Communicating and reflecting	present written work in an orderly way	Communicate own findings effectively, orally and in writing, and discuss and compare approaches and results with others.	Recognise equivalent approaches.	Refine own findings and approaches on the basis of discussions with others.	Recognise efficiency in an approach.	Relate the current problem and structure to previous situations.	Review and refine own findings and approaches on the basis of discussions with others.	Look for and reflect on other approaches and build on previous experiences of similar situations and outcomes.	Use a range of forms to communicate findings effectively to different audiences.	Review findings and look for equivalence to different problems with similar structure	Routinely review and refine findings and approaches.	Identify how other contexts were different from, or similar to, the current situation and explain how an why the same or different strategies were used.	use mathematical language and symbols effectively in presenting convincing conclusions or findings; critically reflect on own lines of enquiry when exploring	search for and appreciate more elegant forms of communicating approaches and solutions; consider the efficiency of alternative lines of enquiry or procedures

Colour coding

Year 7
Year 8
Year 9
Year 10
Year 11
Extension Work

Strands

1. **Mathematical Processes and Applications**
2. **Number**
3. **Algebra**
4. **Geometry and Measures**
5. **Statistics**