Framework for assessing Synthesis and Problem solving skills

	Problem- Solving	**Mastery of Mathematical procedures**	**Reasoning and proof**	**Communication**	**Connections**	**Representations**
No evidence	Problem indicated a clear solution strategy.	No evidence of following any basic mathematical procedure	Activity/Task did not require students to give a reason or proof.	Activity/Task did not require students to communicate in any way.	No connections are made.	No attempt is made to construct mathematical representations.
Students working at "novice" level	No strategy is chosen, or a strategy is chosen that will not lead to a solution.	Evidence of some familiarity with a that a basic mathematical procedure	Arguments are made with no mathematical basis. No correct reasoning or justification for reasoning is present.	Everyday familiar language is used to communicate ideas.	No connections are made.	An attempt I**s** made to construct mathematical representations to record and communicate problem solving.
Students working at "practitioner" level	A correct strategy is chosen based on the mathematical situation in the task. Planning or monitoring of strategy is evident. Evidence of solidifying prior knowledge and applying it to the problem solving situation is present. Correct answer is obtained.	Evidence that a basic mathematical procedure was followed but executed inaccurately	Arguments are constructed with adequate mathematical basis. A systematic approach and/or justification of correct reasoning is present. This may lead to clarification of the task exploration of mathematical phenomenon Noting pattern, structures and regularities.	Communication of an approach is evident through a methodical, organised , coherent sequenced and labelled response. Formal mathematical language is used throughout the solution to share and clarify ideas.	Mathematical connections or observations are recognised.	Appropriate and accurate mathematical representations are constructed and refined to solve problems or portray solutions

Framework for assessing Synthesis and Problem solving skills

	Problem- Solving	**Mastery of Mathematical Procedures**	**Reasoning and proof**	**Communication**	**Connections**	**Representations**
Students working at "expert" level	An efficient strategy is chosen and progress towards a solution is evaluated. Adjustments in strategy, if necessary, are made along the way and/or alternative strategies are considered. Evidence of analysing the situation in mathematical terms and extending prior knowledge is present. A correct answer is achieved.	Basic mathematical procedures were followed accurately	Deductive arguments are used to justify decisions and may result in formal proofs. Evidence is used to justify and support decisions made and conclusions reached. This may lead to • testing and accepting or rejecting of a hypothesis or conjecture • Explanation of phenomenon • Generalising and extending the solution to other cases	Communication of argument is supported by mathematical properties. Precise mathematical language and symbolic notation are used to consolidate mathematical thinking and to communicate ideas.	Mathematical connections or observations are used to extend the solution.	Abstract or symbolic mathematical representations are constructed to analyse relationships extend thinking and clarify or interpret phenomenon.