Standards of Student Practice in Mathematics Proficiency Matrix

	Students:	(I) = Initial	(IN) = Intermediate	(A) = Advanced
1a	**Make sense of problems**	Explain their thought processes in solving a problem one way. *(Pair – Share)*	Explain their thought processes in solving a problem and representing it in several ways. *(Question/Wait time)*	Discuss, explain, and demonstrate solving a problem with multiple representations and in multiple ways. *(Grouping/Engaging)*
1b	**Persevere in solving them**	Stay with a challenging problem for more than one attempt. *(Question/Wait time)*	Try several approaches in finding a solution, and only seek hints if stuck. *(Grouping/Engaging)*	Struggle with various attempts over time, and learn from previous solution attempts. *(Show Thinking)*
2	**Reason abstractly and quantitatively**	Reason with models or pictorial representations to solve problems. *(Grouping/Engaging)*	Are able to translate situations into symbols for solving problems. *(Grouping/Engaging)*	Convert situations into symbols to appropriately solve problems as well as convert symbols into meaningful situations. *(Encourage Reasoning)*
3a	**Construct viable arguments**	Explain their thinking for the solution they found. *(Show Thinking)*	Explain their own thinking and thinking of others with accurate vocabulary. *(Question/Wait time)*	Justify and explain, with accurate language and vocabulary, why their solution is correct. *(Grouping/Engaging)*
3b	**Critique the reasoning of others.**	Understand and discuss other ideas and approaches. *(Pair – Share)*	Explain other students' solutions and identify strengths and weaknesses of the solution. *(Question/Wait time)*	Compare and contrast various solution strategies and explain the reasoning of others. *(Grouping/Engaging)*

4	**Model with Mathematics**	Use models to represent and solve a problem, and translate the solution to mathematical symbols. *(Grouping/Engaging)*	Use models and symbols to represent and solve a problem, and accurately explain the solution representation. *(Question/Prompt)*	Use a variety of models, symbolic representations, and technology tools to demonstrate a solution to a problem. *(Show Thinking)*
5	**Use appropriate tools strategically**	Use the appropriate tool to find a solution. *(Grouping/Engaging)*	Select from a variety of tools the ones that can be used to solve a problem, and explain their reasoning for the selection. *(Grouping/Engaging)*	Combine various tools, including technology, explore and solve a problem as well as justify their tool selection and problem solution. *(Show Thinking)*
6	**Attend to precision**	Communicate their reasoning and solution to others. *(Show Thinking)*	Incorporate appropriate vocabulary and symbols when communicating with others. *(Allowing Struggle)*	Use appropriate symbols, vocabulary, and labeling to effectively communicate and exchange ideas. *(Encourage Reasoning)*
7	**Look for and make use of structure**	Look for structure within mathematics to help them solve problems efficiently (such as 2 x 7 x 5 has the same value as 2 x 5 x 7, so instead of multiplying 14 x 5, which is (2 x 7) x 5, the student can mentally calculate 10 x 7. *(Question/Prompt)*	Compose and decompose number situations and relationships through observed patterns in order to simplify solutions. *(Allowing Struggle)*	See complex and complicated mathematical expressions as component parts. *(Encourage Reasoning)*
8	**Look for and express regularity in repeated reasoning**	Look for obvious patterns, and use if/ then reasoning strategies for obvious patterns. *(Grouping/Engaging)*	Find and explain subtle patterns. *(Allowing Struggle)*	Discover deep, underlying relationships, i.e. uncover a model or equation that unifies the various aspects of a problem such as discovering an underlying function. *(Encourage Reasoning)*