CCSS Standards of Mathematical Practice Rubric

This rubric is intended to measure student work and habits against the Common Core State Standards of Mathematical Practice (MPs). Teachers are to assess tasks that map well with various indicators of the rubric, ideally a few at a time. The rubric could apply to all grade levels, with modifications or different emphases.

DRAFT

The rubric is very much in DRAFT form. Please consider offering feedback by emailing Geoff Krall (gmkrall@gmail.com).

	MP	Emerging	Developing	Proficient	Advanced
MP 1	Make sense of problems and persevere in solving them	Computes a solution with little regard to deciphering the information in the prompt Begins working toward a solution, but discontinues when met with obstacles	Identifies crucial information as well as distractors in a problem Arrives at a solution without background discussion or other evidence	States and analyzes constraints, variables, assumptions, and givens Uses models, diagrams, tables, and other tools to set up the solution method Solution is to the problem is presented with a discussion or evidence	Develops hypotheses as to the form of the solution of the problem Verifies a solution via alternate methods Describes why two different approaches to a problem yields the same or similar results Student monitors progress formally or informally throughout the problem
MP 2	Reason abstractly and quantitatively	Provides no evidence of a visual model Provides no abstraction of the task Offers no quantitative reasoning	Translates scenarios into mathematical abstractions inaccurately Visual models are unclear or misrepresent the scenario	Accurately translates scenarios into mathematical abstractions Uses visual models to represent concepts Accurately transcribes from words to numbers, symbols, diagrams, and other mathematical abstractions	Monitors use and manipulation of symbols throughout a task Representations are clear, coherent and concise Contextualizing and decontextualizing are clear, possibly even including description
MP 3	Construct viable arguments and	Shows no argumentation in the	States a conjecture or solution without clear	Uses conjectures and counterexamples fluidly	Identifies flaws in reasoning and understands their source

	critique the reasoning of others	solution method Fails to document strategic thinking or reasoning Does not make an argument	reasoning Misuses or does not use accepted definitions Responds to others' arguments in ways that don't relate to the task Provides non-evidenced claims in an argument	throughout the task Uses definitions and prior results strategically to develop a line of reasoning Responds to others' arguments with precision and plausibility Cites data, prior knowledge or other evidence in an argument	Specifics for which conditions arguments are true Provides clarifying questions that hones an argument Cites evidences to support a claim while offering caveats and/or sources of error
MP 4	Model with mathematics	Does not attempt to create a model. Fails to identify or misidentifies crucial aspects of the task in their model	Creates a model that doesn't enhance clarity of the scenario States some of the generalizations and estimates pertaining to the model	Creates a model to simplify, explain, and test a solution Identifies crucial aspect of their mathematical model States all necessary generalizations and estimates pertaining to the model Translates the task from ambiguousness to structure	Describes how the model is applicable to other scenarios Explains limitations of the model Reflects on how aspects of the model are interrelated Helps translate the task from ambiguousness to clarity
MP 5	Use appropriate tools strategically	Does not identify strategies that could aid the solution, method, or representation of a solution Given tools go unused or misused	Tools do not help advance a solution or method Tools make the solution or methods muddled With some support, the student identifies an appropriate tool for the task	Chooses and uses tools that help advance a solution method Chooses and uses tools that help communicate the solution Student identifies unconventional tools to help aid their solution, method,	Identifies sources of error emanating from their chosen tool set Conducts research to identify the tools needed Student identifies and explains the discovery and use of an unconventional tool

				or representation	
MP 6	Attend to precision	Neglects the use of symbols, units or labels Work is disorganized and/or unclear Does not demonstrate careful thinking throughout at task	Loses track of symbols, labels, and/or units over the course of a solution Solution is stated without units or explanation Work is Solution has a degree of precision that is inappropriate for the given scenario	Uses appropriate units throughout the task Uses and/or develops appropriate math symbols and terminology Organization makes the work easy to follow and understand Solution has a degree of precision appropriate to the scenario	Uses accepted terminology and definitions to seamlessly describe a solution method Gives a range or set of circumstances for which the solution is accurate Verifies final solution for reasonableness
MP 7	Look for and make use of structure	Sees the problem as disconnected from prior learning and mathematical structures Work is haphazard or aimless	Completes the task without drawing connections to other content or structures Uses notation and terminology consistent with the discipline With support, draws upon prior knowledge to solve the problem	Identifies underlying mathematical structures Draws connections within the task Independently draws upon prior knowledge to solve the problem	Breaks down a scenario into smaller, more manageable pieces Regularly cites existing theorems or postulates, or other aspects of the task Build on prior knowledge to enhance the solution
MP 8	Look for and express regularity in repeated reasoning	Completes the task without any generalization (solely uses iterative methods) Applies commonly used existing formulas to a situation	Attempts to demonstrate connections with prior content Connects generalized formulas to the task	Connects method and solution to prior content Identifies patterns within a task	Uses results from a problem or problems to make generalizations Explains patterns that aid the solution and generalizations