Mathematical Thinking Behaviors – Rubric

Mathematically Proficient Students….	Attempting: I need more time/support/experiences to learn this concept.	Approaching: I understand this concept and I can work the problems independently.	Meeting: I understand this concept and I can explain it to someone else. I can be strategic and validate my solution.	Exceeding: I show how I understand this concept and extend it to other concepts I have learned and apply to the world around me.
Take Risks – I make my thinking and curiosity visible to others. I know mistakes help my brain to grow. I work in collaboration with other because I know it will deepen the learning for all of us.	I'm not sure what to do to get started. I'm afraid if I try something it will be wrong. I listen to others ideas but I'm not comfortable or ready to share my thinking.	I have a preferred method to solving that I use I will try a strategy that I know. If it doesn't work, I'm going to ask someone to show me what to do. I listen to others ideas and also share my thinking with others.	I will try a strategy. If it doesn't work I will try using a different method. I will share my ideas and listen to the ideas of others to try and figure out something that will work. I share my thinking with others and consider ways my ideas compare & connect to others. I am open to alternative methods and ideas and I am willing to change my thinking based on others methods.	I seek challenges! I know that when I make a mistake, I can learn something from the mistake. I might have to try many different strategies and seek out resources to help me finally get it. The work and thinking will take time and persistence. I generate alternative methods and ideas prompted by the ideas of others.
Self Monitor and Reflect – I can pick out examples of my work that highlight my progress in learning the intended math concept. I can identify and engage in behaviors that will propel my learning forward.	I'm not sure the about the questions I should ask to help me learn. I rely on the teacher/other students or the answer key to tell me if my solution is correct. If I am told I am making errors, I'm unsure how to fix them.	I ask questions to clarify my own understanding. I check if my solution is reasonable when I am finished with the problem. If I made an error, I can go back and find my mistake, but I'm unsure how to fix it.	I ask questions that help me make connections, think more deeply about a concept, and/or clarify someone else's thinking. I check if my work is reasonable as I solve and adjust if necessary as move towards solution. If I make an error, I can find my mistake and fix it.	I ask questions to deepen my understanding an seek ways to apply my understanding in new ways. I ask "what if…" questions and explore possible responses to my wonder/question. If I make an error, I can find my mistake, fix it and explain what I did incorrectly.

Make Connections – I can connect mathematics to other subjects and the real world. I can connects topics within mathematics. I am curious about how this relates to what I know about the world around me.	Math is something I only do in school. I don't have answers to the questions, "Why am I learning this?" and "When am I ever going to use this?" I'm just making sense of this new concept. I'm wondering how it connects to other math concepts I have learned.	I can make connections between the concept I'm learning and a situation outside of math class. I can make a connection to ways I might use this concept to do math in my future. I understand the connections that others are making between this concept and other concepts I have already learned.	I can make predictions and ask questions about the problems and tasks I am engaging in during class. I am making connections between this concept and other concepts I have learned. I am making connections between my thinking and the thinking of others.	I am using the connections that I am making between this concept and other concepts to justify my thinking, prove why, construct arguments, make conjectures, etc. I am constantly looking for connections or notice connections when I least expect it. I can create a real world context for a given representation.
Communicate mathematical ideas – I can …ustify and explain their math thinking –	I'm applying a strategy or using a model that doesn't work with this concept.	When reminded about a model or strategy that has been taught to me, I can use it to show my thinking. I understand how it works for a particular kind of problem.	When given any problem, I can apply what I know and use a strategy or model to show my thinking. I use mathematical language as I communicate my thinking and justify my solution. I use my representation to communicate my ideas.	I use an efficient strategy/model for the given problem/situation. I can justify why I chose my method and what makes it efficient in this situation.
Create & use mathematical representations – I can generate and use representations to model my thinking and make sense of abstract ideas. My representation helps to communicate my ideas with clarity.	I'm copying the representation that is being shown to me and I'm having a hard time understanding what it means.	I can create a model/representation of a problem when given an example. I've memorized a strategy that someone else taught me, but I'm not quite sure how to use it in different kinds of problems. I'm not quite sure how or why it works yet	I can create my own representation of the problem/situation in a way that makes sense mathematically.. I can create multiple representations of the same problem or situation. I can use what I know to figure out something that I'm trying to solve.	I can flexibly use representations to build understanding, show my thinking or to make abstract ideas more concrete. I can make connections between multiple representations of a given situation/solution method.