



## ***MEC MSP Theory of Action***

***If teachers have opportunities to learn mathematics in ways that fully model all of the following then they will continue to grow in their ability to...***

- Anticipate typical student responses, misconceptions, and common errors
- Recognize mathematical principles and logic as the basis for determining the validity of students' mathematical reasoning
- Make flexible and responsive classroom decisions guided by the reasoning revealed by students in the moment
- Probe to understand student thinking rather than ask questions to guide student thinking
- Work to stimulate productive cognitive dissonance
- Focus teaching and learning on the significant mathematical ideas and concepts (big ideas) at the unit level rather than the individual lesson level or CCSS standard level
- Encourage students to solve problems in ways that make sense to them and examine diverse approaches in order to deepen their understanding of mathematical ideas and connections among those ideas
- Recognize that when it comes to mathematics, what is efficient might differ for each student; honor those differences and help all students learn increasingly more efficient approaches and strategies
- Make public their own authentic moments when they are trying to mathematize problems and willingly learn mathematics alongside their students
- Believe that ALL students, and they themselves, are inherently capable of thinking mathematically
- Actively work to help students develop a sense of agency
- Employ multiple assessment practices that are aligned with the mathematical outcomes (mathematical big ideas in the unit, mathematical communications, and mathematizing problems)
- Establish a classroom culture that fosters constructive discourse and promotes mathematical habits of mind (socio-mathematical norms)

***Then students will grow in their ability to...***

- Analyze complex problems to identify assumptions, constraints, and make meaning of the context
- Identify and carry out multiple mathematical approaches to solve problems
- Verify solutions within the context of the original problem
- Construct viable arguments to explain and justify their reasoning mathematically
- Critique the reasoning of others using mathematical principals and logic
- Use multiple perspectives including geometric, algebraic, numeric, verbal and graphical to understand, represent, and communicate mathematical ideas and to solve problems
- Look closely to discern patterns or structures as they work to identify or generalize a mathematical idea across seemingly unrelated contexts and problem situations
- Believe in themselves as inherently capable of thinking mathematically
- Have a sense of agency and a disposition to actively engage in mathematical reasoning and persevere in making sense of and solving complex problems and situations

***Then students will***

- Be motivated to pursue further study and exploration of mathematics
- Increase achievement on mathematics assessments

## Definitions

### ***Agency***

A subjective awareness that one is initiating, executing, and controlling one's own volitional action in mathematics and beyond; A sense of agency is closely associated with one's sense of ownership; 'Aha' moments help to build a sense of agency

### ***Persevere***

Students understand that the level of satisfaction they get from solving a problem is often directly proportional to the amount of time and struggle it took to solve it, and they work on a problem until they are convinced that they understand it

### ***Mathematize***

Students can take a complex problem or situation and identify and carry out the mathematics needed to solve the problem or analyze the situation

### ***Classroom Culture***

A classroom culture that adheres to the socio-mathematical norms, for example, the desired classroom culture is one where:

- Students are encouraged to ask questions
- Curiosity is fostered and valued
- Answers are important, yet it is the mathematical reasoning and communication of ideas that is of utmost importance
- Mistakes are springboards to learning
- Discourse is the norm
- Diverse approaches are examined and valued