# Innovation Configuration Map: Clarifying Effective Mathematics Teaching Practices

Developing a culture of organizational learning and collaborative communities of practice is among the greatest challenges and goals of any instructional leader – district or building administrator, curriculum specialist, instructional coach, or teacher-leader. The use of reflective tools can guide instructional leaders as they grapple with the complexities of building and sustaining ongoing collaborative learning. This document provides a suite of such tools to help instructional leaders enact and foster systemic change by creating the kinds of district, school, and classroom environments needed to prepare students for success. Regular application of these tools helps leaders determine needs, plan actions, measure the impact of those actions and support others through organizational change.

A change, or innovation, can assume several different configurations that encompass the ideal state envisioned by its designers and different variations arising from user interpretation and experience. Innovation Configuration (IC) maps are descriptive documents that provide clarity by detailing what an innovation should look like in practice. IC maps detail the *how* and *what* of an innovation and provide a way to understand the possible progression of behaviors. These maps are useful not only throughout the change process, but also once an innovation is fully implemented and leaders strive to maximize outcomes. IC maps allow educator teams to develop a common understanding of effective behaviors, identify where additional support is needed, and encourage self-reflection and self-assessment. It is important to note that IC maps are not intended as evaluative tools. Instead, they are a means to assess and measure the various forms of innovation implementation and inform goal setting and next steps. Inherent in the productive use of IC maps is the need to openly share their purpose and intent and use results to enhance collaboration in ways that allow all voices to contribute.

The following IC maps, organized around four of the eight National Council of Teachers of Mathematics' effective math teaching practices,– *Implement tasks that promote reasoning and problem solving, Use and connect mathematical representations, Elicit and use evidence of student thinking,* and *Pose purposeful questions* – give instructional leaders purposeful opportunities to pause, reflect, and compare current practice to organizational values and expectations.

Instructional leaders can use these tools in ongoing continuous improvement efforts to –

- Initiate or focus the conversation about instructional leadership.
- Examine the current state of instructional leadership in a district or school.
- Design or strengthen existing district or school structures for collaboration and learning.
- Support job-embedded professional leadership growth and development.
- Guide decision-making about how to leverage instructional leadership to improve teaching and learning.

You can further your understanding of the research-based teaching practices covered in the IC maps by reading the National Council of Teachers of Mathematics' book, Principles to Actions: Ensuring Mathematics Success for All and continue your learning on the purpose and use of IC maps by watching this video.

## Innovation Configuration Map: Clarifying Teaching

| **2. Implement tasks[3] that promote reasoning and problem solving** (Motivate students through opportunities to explore and solve problems that promote reasoning and thinking; support students in exploring tasks aligned to the cognitive demand of the CCRSM) | | | | |
|---|---|---|---|---|
| **Level 1** | **Level 2** | **Level 3** | **Level 4** | **Level 5** |
| Teachers:<br>• Implement tasks that provide multiple entry points through the use of varied tools, multiple representations, and solution strategies.<br>• Implement tasks that require students to use strategies and procedures in ways that are meaningfully connected with concepts and that build on/extend new mathematical understanding.<br>• Engage students in tasks that draw on prior experiences by attending to context, culture, conditions, and language, OR by creating common experiences as the foundation of the task.<br>• Facilitate discourse among students around key mathematical aspects of the task, scaffolding questions for varied levels of student understanding, to support students while maintaining the challenge. | Teachers:<br>• Implement tasks that provide a limited number of entry points and include suggested tools, representations, or solution strategies.<br>• Implement tasks that require students to use strategies and procedures in ways that are connected with concepts or understanding.<br>• Engage students in tasks that connect to prior experiences or create common experiences<br>• Utilize scaffolding questions to support students as they engage in the task while maintaining decreasing the challenge. | Teachers:<br>• Implement tasks that provide limited number of entry points and allow only limited solution strategies.<br>• Implement tasks that require students to connect procedures with concepts or understanding.<br>• Engage students in tasks that connect to prior learning.<br>• Ask leading questions that decrease the challenge of the task. | Teachers:<br>• Center most instructional time around memorization and procedure-based tasks without connection to context or conceptual understanding.<br>• Ask leading questions that decrease the challenge of the task. | Teachers:<br>• Center instructional time around memorization and procedure-based tasks without connection to context or conceptual understanding.<br>• Ask leading questions that eliminate the challenge of the task. |

[3] Tasks should be at grade level and should align with stated goal(s).

## Innovation Configuration Map: Clarifying Learning

| **2. Implement tasks that promote reasoning and problem solving** (Explore, reason, and communicate while engaging in mathematics; use tools and representations to support thinking and problem solving; accept and expect a variety of solution approaches) | | | | |
|---|---|---|---|---|
| **Level 1** | **Level 2** | **Level 3** | **Level 4** | **Level 5** |
| Students:<br>• Use and consider different representations and tools, leveraging prior knowledge, to support thinking and problem solving.<br>• Engage in active inquiry to build mathematical understanding through problem solving.<br>• Persevere in reasoning, while self-monitoring through the task, by using a variety of strategies to enter into the task and obtain a solution.<br>• Communicate students' own thinking about the task, and participate in discourse in order to understand and accept a variety of solution approaches.<br>• Use strategies and procedures in ways that are meaningfully connected with concepts and that build on/extend new mathematical understanding.<br>• Communicate how the mathematics in the task are personally relevant and connect to other mathematical ideas. | Students:<br>• Use and consider different representations and tools, leveraging prior knowledge, to support thinking and problem solving.<br>• Ask questions and problem solve to extend mathematical understanding.<br>• Persevere in reasoning through the task by using a variety of strategies to enter into the task and obtain a solution.<br>• Communicate students' own thinking about the task and discuss a variety of solution approaches.<br>• Use strategies and procedures in ways that are connected with concepts or understanding. | Students:<br>• Use different representations and tools to support thinking and problem solving.<br>• Engage in problem solving.<br>• Persevere in reasoning through the task by using a limited number of strategies to enter into the task and obtain a solution.<br>• Communicate students' thinking about the task and consider more than one solution approach.<br>• Connect procedures with concepts or understanding. | Students:<br>• Use limited representations and tools to problem solving.<br>• Engage in problem solving with support from teachers.<br>• Reason through the task by selecting and using a strategy to obtain a solution, and lean on the teacher for guidance for monitoring and adjusting strategy.<br>• Communicate students' thinking about the task. | Students:<br>• Rely on procedures and teacher-provided strategies to solve problems.<br>• Rely on support from teachers in order to engage in solving problems.<br>• Students show how they obtained solutions. |