



# Intensive Critical Learning Instructional Pathway for Student Success in Mathematics, 2015-2016

## Working Through Level 1&2: Students' Learning Journey

DURHAM DISTRICT SCHOOL BOARD  
K - 6 PROGRAMS

### Overview of the Initiative

The purpose of this research initiative is to explore the impact of implementing an intensive critical pathway for student success in mathematics on teacher and student attitudes, student achievement and teacher practice.

#### Goals:

- co-learning, co-planning, co-teaching and co-debriefing between the iCLIPSS coach and classroom teachers and together, shaping the learning sub-conditions of the classroom
- providing an opportunity for colleagues to reflect on instructional practice
- identifying the factors that enable students to work through Level 2 to Level 3
- linking theory to practice in practical ways leading to embedded practice

### Learning Goal and Success Criteria

#### Learning Goal:

We are learning to teach through problem solving and analyze student thinking in mathematics in order to address the needs of all students.

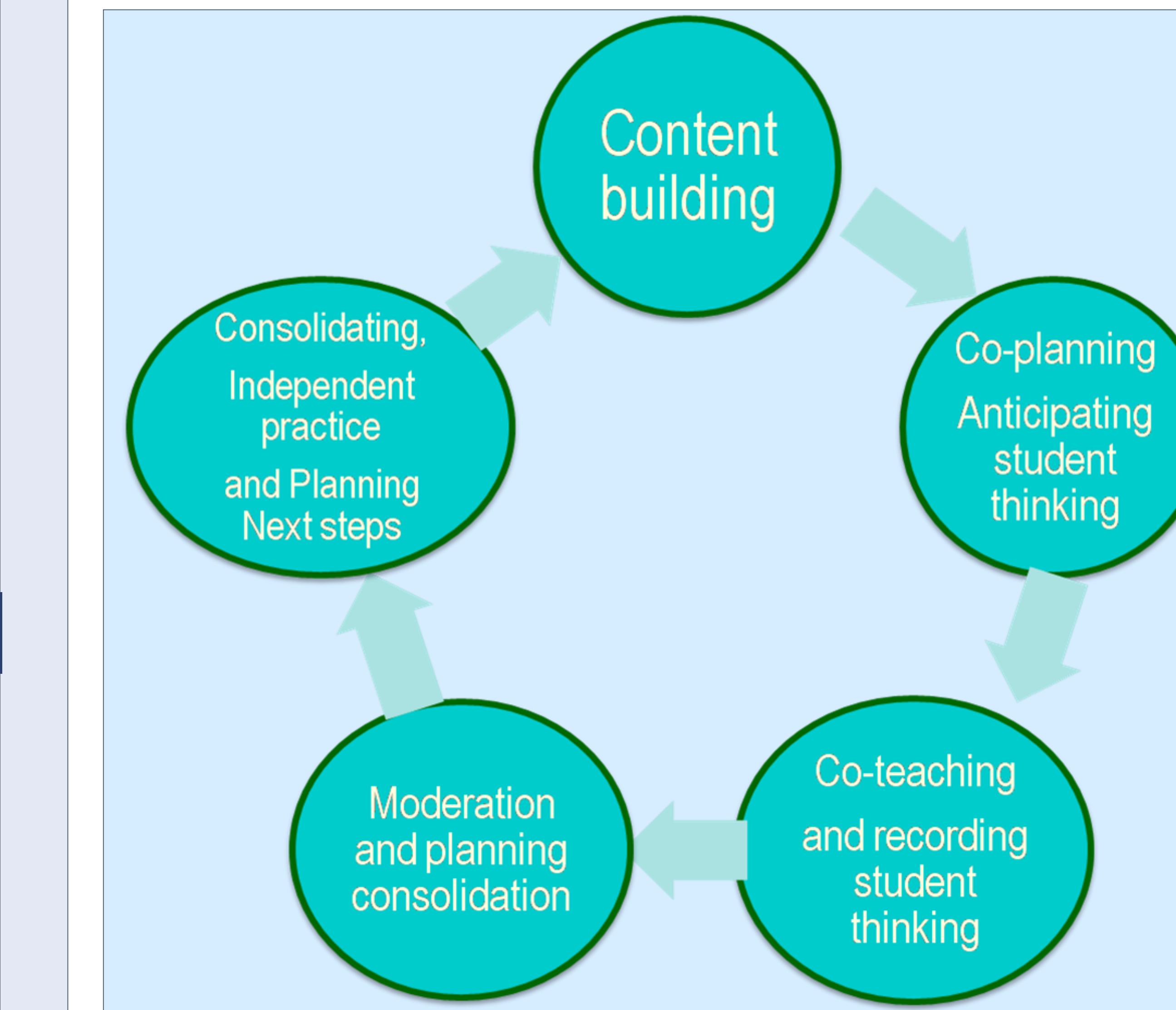
#### We will know we have been successful when:

- We understand the mathematics curriculum and can determine what students need to know and be able to do to successfully demonstrate their knowledge and understanding of the concept being taught
- We can design a rich task that allows students to construct their own understanding and demonstrate what they know about a mathematical concept through a problem solving model
- We can look at student work and determine what they understand and their misconceptions about a concept
- We can use student work to plan our next steps for teaching and move student thinking forward

### Project Logistics

- 23 schools, 2 junior teachers per school
- Schools involved: Bolton C. Falby, Cedarackque, Carruthers Creek, Lord Elgin, Roland Michener, Romeo Dallaire, Terry Fox, Vimy Ridge, Cartwright Central, R.H. Cornish, S.A. Cawker, Bobby Orr, College Hill, David Bouchard, Forest View, Glen Street, Lakewoods, Queen Elizabeth, Sherwood, Stephen G. Saywell, Woodcrest, Gandatsetiagon, Bellwood
- 2 full days per month to develop pathways
- Content building included in planning process
- Resources shared: [Math Expressions](#), [Open Questions for the Three-Part Lesson \(4-8\)](#), [Number Talks](#), [Making Math Meaningful](#), [Numeracy Nets](#), [Leaps & Bounds](#)

### Pathway Cycle



Through this **Pathway Cycle**, the role of the teacher changes dramatically from a keeper of knowledge to a facilitator of knowledge. Students become the leaders of learning which is tied to a constructivist approach. The change in students' engagement in the pathway (from passive to active) is evident in the increase of student sharing in homogeneous groups and an increase in the use of manipulatives during the teaching and problem solving.

Teachers observe that if the context of the lesson is not set, the lesson will not flow. Setting the context means giving the students a reason to want to solve the problem. Setting the context may include a variety of possibilities including – providing information that will help students solve a problem (an oral story, a read-aloud, etc.), finding out what students already know about a concept (class discussion on and around questions), a game that is connected to the “big idea”.

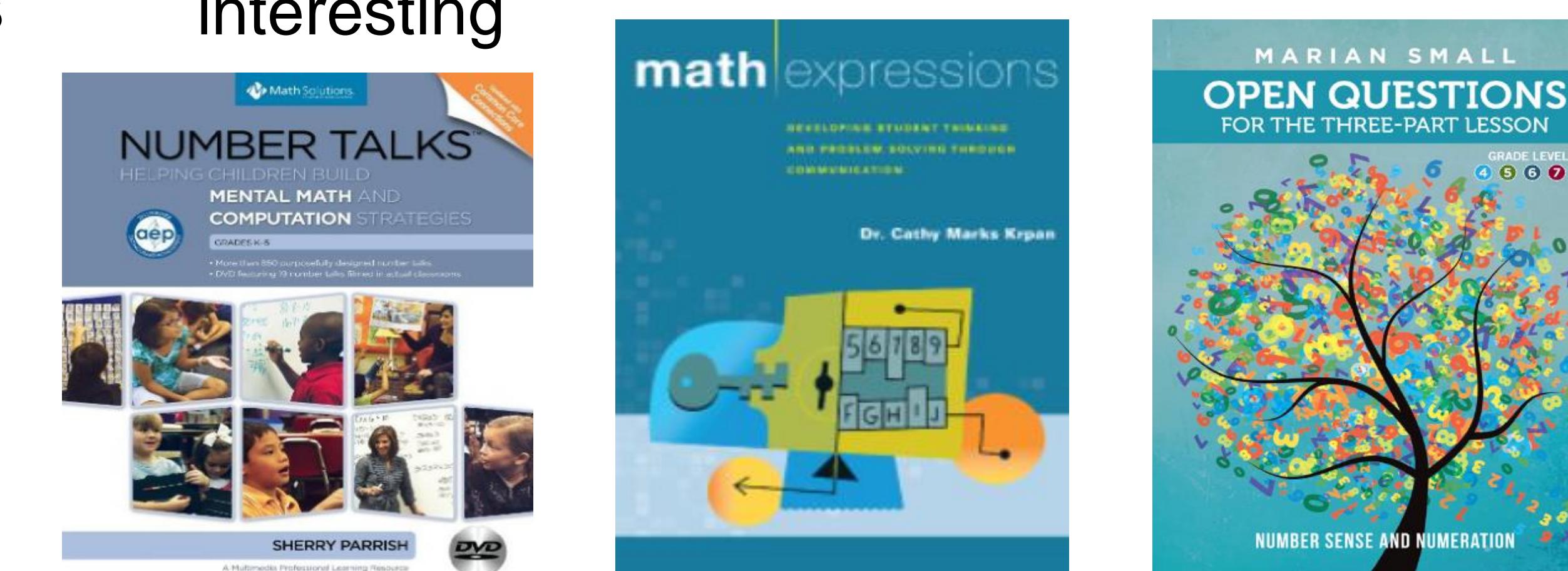
### Highlights of iCLIPSS

#### Teachers report...

- their confidence has contributed to their students' self-confidence in math
- they deliver a better math program when they plan collaboratively with others
- they are able to make connections between mathematics and the real world for their students
- they feel comfortable grouping their students according to their mathematical misconceptions
- a change in thinking when it comes to deconstructing the curriculum

#### Students report...

- feeling more confident in math now than at the beginning of the year
- more frequent practice using descriptive feedback they are given to improve their work
- participating more in class
- finding the work they are doing in classrooms interesting



### What We Have Learned

- Co-teaching and teacher moderation support planning effective next steps for student learning
- Evidence (conversations, observations, and products) should drive instruction and guided practice
- Exit Tickets provide teachers with feedback that can be used to help plan purposeful next steps for students
- It is important to try to make strand to strand connections whenever possible
- It is important for students and teachers to have a growth mindset about mathematics
- Using the Big Ideas helps guide purposeful classroom instruction
- Using diagnostics helps to uncover misconceptions
- Rich tasks promote conceptual understanding and student engagement
- Using centres can help facilitate guided practice as an intervention

### Teacher Voice

"I really enjoyed the co-planning process with my peers and breaking down curriculum expectations into time frames that were realistic, manageable and focused on the big ideas."

"I also appreciated having the opportunity to co-teach with educators from other schools to truly reveal student misconceptions. This allowed me to provide specific feedback based on various pieces of student work."

### Administrator Voice

"iCLIPSS provided me with the opportunity to truly co-learn, co-plan, moderate and co-teach alongside my staff."

"We were able to dig deeply into the pre-assessment data and document student thinking to identify the student learning need and plan rich three-part lessons to address the identified need."

"I learned alongside my staff and engaged in deep and relevant conversations about student thinking and learning needs."