

Supporting Mathematical Thinking through Formative Assessment Building a Mathematical Community

Synopsis: Creating a culture of mathematical discourse in your classroom will help your students meet the learning goals of the Alberta curriculum. In this video, learn about how students and teachers at one Alberta school are exploring strategies, strengthening number sense, and building a mathematical community through math talks.



Questions for Discussion and Reflection:

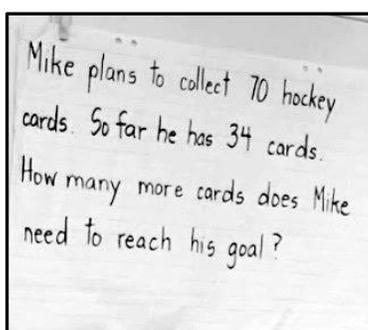
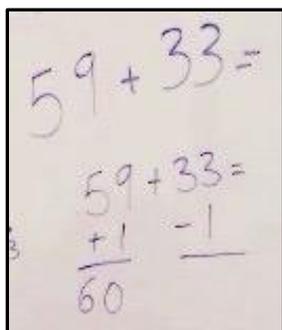
As you watch this video, keep these questions in mind. You may wish to pause the video for discussion.

- What do you notice about the **classroom environment** during the math talks? How do you go about creating that environment in your classroom?
- What is the **role of the teacher** in this community? What is the **role of the students**?
- How does **assessment** change in this environment? How might you gather and record evidence of learning? What is the role of formative assessment?
- **Teacher collaboration** is key to moving your instruction and assessment practice forward. How and when might this take place? How might this be supported at a school level?

Key Ideas:

Students need to develop a robust number sense that allows them to work flexibly and efficiently with numbers. Math talks are an important instructional strategy for achieving this goal.

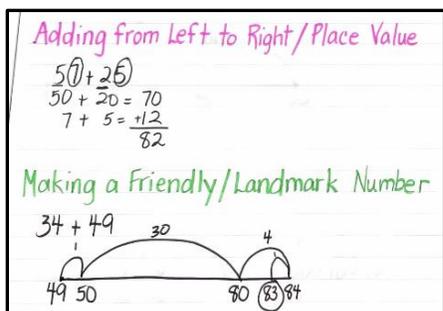
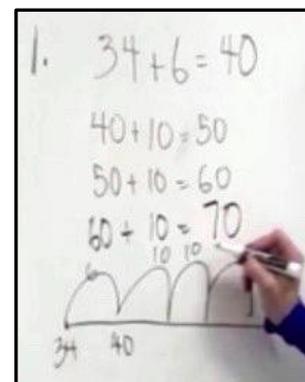
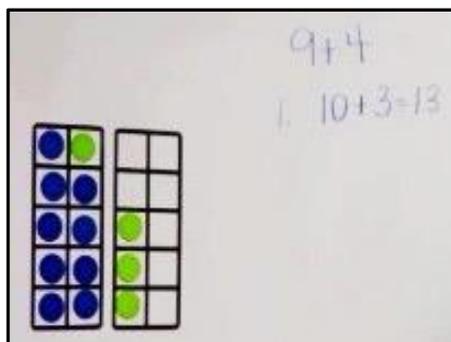
Through math discourse, students develop math vocabulary and the ability to solve equations mentally, explain their thinking and defend solutions.



Teachers carefully choose the numbers and contexts they present to encourage the development of targeted strategies.

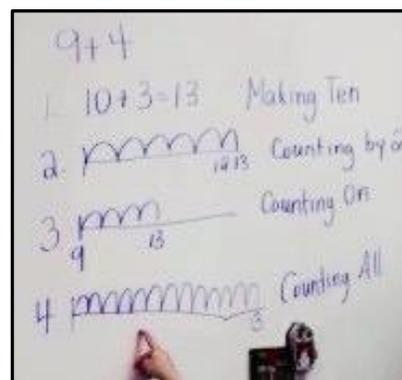
Teachers provide and model the use of a variety of visual supports and tools.

When teachers model and represent student thinking, it deepens student understanding and supports their ability to use the strategies on their own.



Teachers create a record a record of the various strategies that have been suggested and explored, and add to that list over time as new strategies are introduced. (See [Other Resources: Strategy Charts](#))

Students are encouraged to compare different strategies and consider the efficiency of each. They begin by using strategies that make sense to them. Teachers honour those strategies, but through probing questions help students move toward strategies that are more efficient.



When it comes to assessment, teachers focus on mathematical thinking, rather than only right and wrong answers. Mistakes are part of the learning process.



When teachers have the opportunity to collaboratively examine student work, they support one another in their growth as effective mathematics teachers.

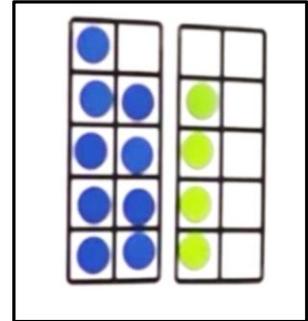
Students are exposed to a number of different strategies, but are not required to master them all. Teachers and students work together to ensure all students develop facility with at least one reliable and efficient strategy that they understand.

Next Steps:

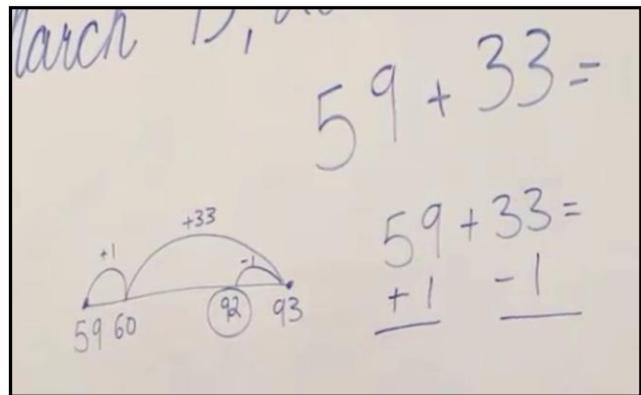
Try a number talk with a group of students. Choose a short problem that you think may encourage a strategy from your grade-level Program of Studies.

Examples (from the video):

- Grade 1: Use a problem such as $9+4$ and provide a ten-frame visual of the problem.
 - Outcome – Number, 10: Describe and use mental mathematics strategies, such as... making ten...



- Grade 3: Use a problem such as $59+33$ and be prepared to model using an open number line as well as numerical equations.
 - Outcome – Number, 6: Describe and apply mental mathematics strategies for adding two 2-digit numerals such as... taking one addend to the nearest multiple of 10 and then compensating.



Soon afterward, meet with a colleague who has also tried a number talk (preferably at your grade level, possibly using the same problem). Reflect on the experience, share what you learned about your students and the strategies they choose, and plan for your next number talk.