

Destreamed Grade 9 Math Leading the Implementation

Professional Learning Network # 3: Supporting Teachers with Assessment

Nadine/Luciana

Land Acknowledgement

I acknowledge that I am on the ancestral territory of nations within nations including the Anishnabe, the Ojibwe and the Michi Saagiig, the inherent right-holders of this land which is home to many diverse First Nations, Inuit and Métis peoples. I am grateful to have the opportunity to work and learn on these lands in a community of sharing.

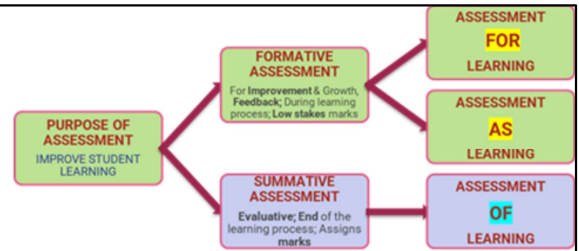
As educators, we have a duty to learn, understand and redress the historical and ongoing impacts of colonialism. We have a responsibility, individually and collectively, to reconcile our relationship with the land and Peoples.

Nadine/Luciana

We will read this and each presenter will “say” something briefly specific to their place and invite the participants (while presenters are sharing) to add in the chat window something specific to where they are

De: in udgsb which covers the ancestral and traditional territories of Mississaugas of the Credit, the Six nations of the grand river and Saugeen Ojibway Nation Territories

Today's Goals



1. Intro: What is sound Assessment
2. Big Ideas for today's focus
 - Explore assessment as ongoing and embedded in instruction
 - Discover a variety of assessment strategies.
 - Consider how to put assessment data together.
3. Wrap up

De

Review our plan today - set the stage about what sound assessment is and then explore 3 ideas, breaking into discussion after each idea so everyone can share ideas about what they are doing with assessment in the destreamed course

Sound Classroom Assessment . . .

Is used to improve teaching and learning

Is ongoing and imbedded in instruction

Uses a variety of assessment strategies

Is aligned with curriculum and instruction

Focuses on meaningful mathematics

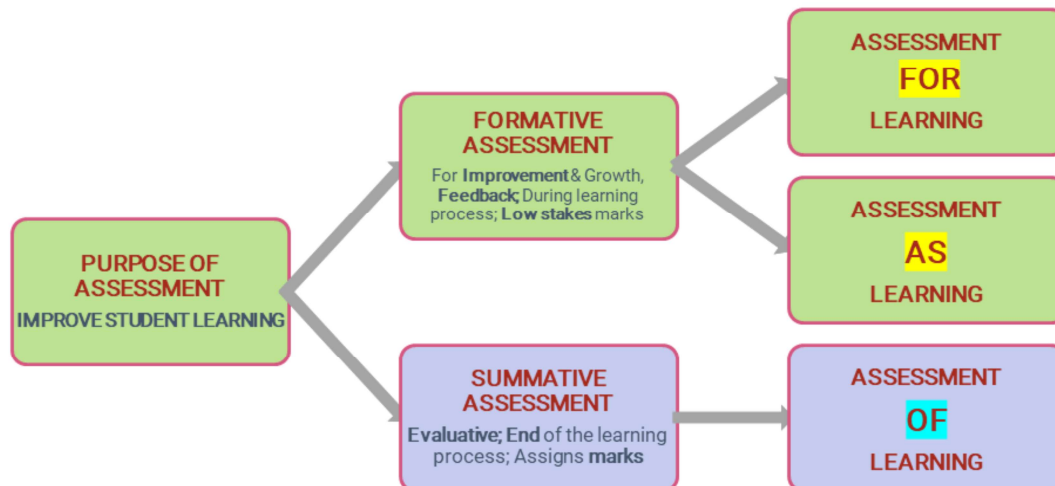
Includes students in the assessment
process

(Suurtamm & Arden, 2017)

Chris

There are many components to sound classroom practice. These components are equally important, or rather even more important, when we are considering a destreamed class with a range of learners. The first on the list is the recognition that the purpose of assessment is to improve student learning (and of course teaching). This is a prevalent message in assessment research literature, and we also see it echoed in Ontario curriculum and assessment documents such as the new math curriculum and of course in Growing Success. The others in the list help to support this main purpose and although they are all important, today we are going to specifically focus on assessment as ongoing and imbedded in instruction, the use of a variety of assessment strategies, and in including students in the assessment process, particularly when teachers are putting their assessment data together, These are the 3 ideas we will look at and to consider what these might look like in a destreamed math classroom, and how we, as administrators, can support teachers in making this happen.

Assessment as Ongoing and Embedded in Instruction



Varvara

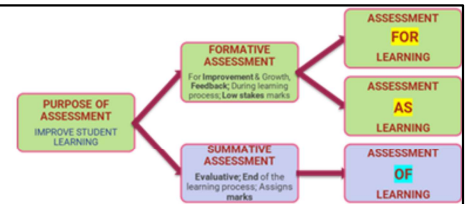
Let's explore a bit how we could do this....

The Ontario Curriculum, 1-8 & 9-12, defines the Assessment as “the process of gathering information that accurately reflects how well a student is achieving the curriculum expectations...” Assessment and evaluation should be based on the provincial curriculum expectations and the achievement levels. Through assessment teachers gather information to determine students’ strengths and weaknesses in their achievement of the curriculum expectations. The data gathered are used to assist teachers in reflecting/adapting/revising instructional classroom strategies to reach every student.

The primary purpose of assessment and evaluation is to improve student learning. Assessment for the purpose of improving student learning is seen as both “assessment **For & As** learning”.



Sound Classroom Assessment is Ongoing and Embedded in Instruction



Assessment is not an event but a process

- Assessment occurs throughout instruction as teachers pose questions, listen to student thinking, and respond to that thinking through the moves they make
- Recent research on “noticing” student thinking highlights that this is important work of teaching (e.g. Jacob, Lamb, and Philip, 2010)

Chris

Assessment should not be seen as an event but is a process that is constantly occurring in a classroom. As teachers pose questions, listen to student thinking and respond to that thinking they are constantly in assessment mode. This might occur in whole class discussions, through observations of students working in groups, or when working with individual students. These informal assessments are constantly informing the teacher about the next steps for the student as well as the teacher's next steps. This work of “noticing” student thinking or assessing in the moment is at the heart of teaching.

Teacher Questions

Types of Teacher Prompts

Seeking an alternate method	
Asking to review work	You need to come to a consensus . . .I'll be back after you review it.
Encouraging thinking	
Posing new challenges	So, what do you think we should do next?
Asking to explain thinking	
Listening and observing	
Promoting group interaction	Can you explain to Jason what you did?
Seeking sense-making	Why does that make sense?
Encouraging/ Praising students' thinking	
Teacher paraphrasing	
Supporting math language	What made you think of unit rates?

Chris

Some of the research that I (Chris) have done has highlighted the types of questions that teachers often ask that help to elicit student thinking. Examples of some of these questions are provided such as asking students working in a group to review their work, with the promise that the teacher will be back to see where their thinking is; or posing new challenges; or encouraging students to explain to others; or a very useful question “Why does that make sense?” Many math teachers at the secondary level are familiar with the work of Peter Liljedahl and the Thinking classroom with the use of Vertical Non-permanent Surfaces (whiteboards). He encourages these same types of questions when observing students working as well as when consolidating learning.

Assessment as Ongoing and Embedded in Instruction

Assessment:

- Is more than the test - **guides** teaching and enhances learning
- Is **equitable** and **fair**
- Builds a common understanding of success
- **Provides evidence** of learning through multiple ways
- Focuses on **understanding**
- promotes **collaborative** sharing of ideas and strategies
- **Informs** classroom practice

Students:

- take **ownership** of their own learning and develop **independent** learning skills
- find **enjoyment** in mathematics and become more confident in doing mathematics
- develop effective skills to **investigate** and make **conjectures** about mathematical concepts and relationships
- develop capabilities to reflect on alternative **ways** to perform a task
- develop **flexibility** in their thinking about mathematical concept and be able to represent those concepts in various ways.

Varvara

Assessment is a tool that **guides** teaching and enhances learning. Assessment must be **equitable** and **fair** for all students. It builds a common understanding of success, **provides evidence** of learning through multiple ways, focuses on **understanding**, promotes **collaborative** sharing of ideas and strategies, **informs** classroom practice, etc.,

When the teachers apply effective assessment strategies, **students** will take **ownership** of their own learning and develop **independent** learning skills. Students tend to like mathematics more and therefore they will become more confident in doing mathematics. They will develop effective skills to solve mathematical problems, i.e. **investigate** and make **conjectures** about mathematical concepts and relationships. Students will develop capabilities to reflect on alternative **ways** to perform a task or solve a problem. They will develop **flexibility** in their thinking about mathematical concept and be able to represent those concepts in various ways.

Assessment as Ongoing and Embedded in Instruction

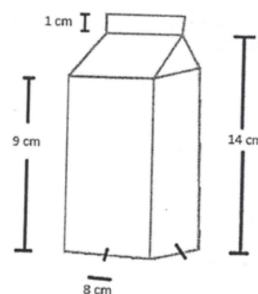
Math Unity Inquiry Question:

What are the **most important** Mathematical characteristics to consider when designing a container that best meets the designers purpose?

Math Unit Inquiry Task:

A drink company held a contest in which people submitted blueprints of designs (in black and white for their new **individual**-sized drink containers. They hired you to determine which, if any of the submitted designs are **suitable** and to complete a report outlining your findings. If you find that more than one of the container designs are suitable, your report will include a ranking of the designs from most to least suitable and recommend the **best** design for the company you use.

Example (students work throughout the unit refining their choice)



[Rubric/Criteria](#)

De

This is a real classroom example, where teachers created it with Laura Gini Newman from TC² (the Critical thinking consortium) as part of a PD experience. The teacher launched the question on day one of the geometry unit, telling students they would be examining different designs for a container and would be selecting the best one and writing a report as their summative task. Together with students they developed criteria (such as volume, packaging, shipping, aesthetic etc) for selecting the most appropriate design. Each day a new design was provided for students to consider and the lesson of the day examined similar shapes, formulas for surface area, volume etc. Students kept their work in a journal adding notes as they considered each shape against the various criteria. Teachers monitored this process work giving feedback and posing questions back to students. In the end students submitted all their ongoing work and final report for grading. (Links for each page will be added to the chat for participants can examine and should be live in shared slides)

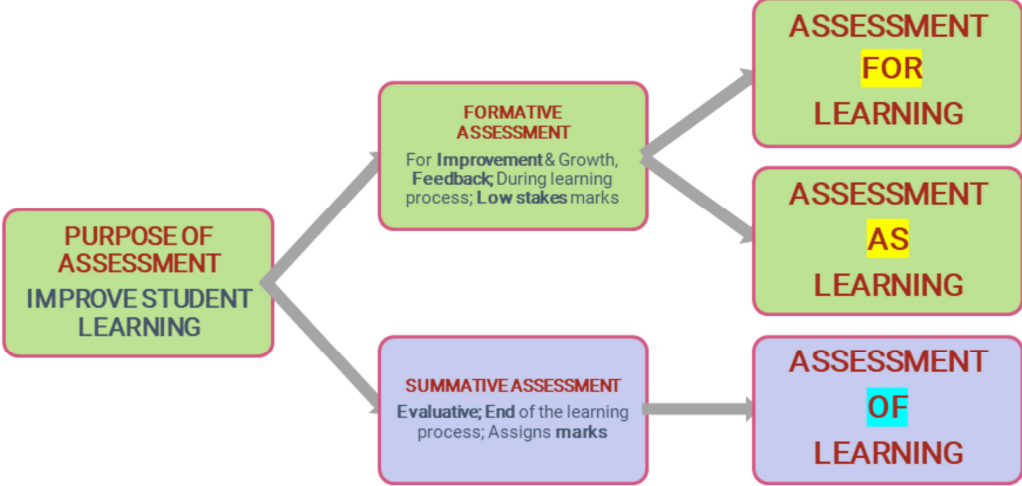
Breakout Group:

How do I help teachers ensure assessment is ongoing and embedded in instruction?

- How have you responded to this question with your implementation?
- What questions/challenges do you still have?

Chris

Using a Variety of Assessment Strategies



Varvara
Let's discover a variety of assessment strategies...

Using a Variety of Assessment Strategies

Recognizes that students demonstrate their learning in different ways

Provides multiple opportunities to show what they know and can do

Takes into account the complex processes of doing mathematics

Chris

There are many reasons to use a variety of assessment practices. Usually, people think of the first two reasons on this slide, but it is also important to consider the third on this list. Learning and doing mathematics requires a variety of actions. We could look at the verbs in the curriculum to see this - students calculate, explain, create, demonstrate, graph, compare, investigate, etc. or we can also look at the mathematical processes: communicate, problem solve, represent, reason and prove, reflect, connect, and select tools and strategies. This variety of mathematical actions cannot be assessed with one assessment tool, and certainly not only with a paper and pencil test. Rather, we need to observe students working, have conversations with students, ask them to present their work, etc. to get a true understanding of what they know and can do.

Variety of Formative Assessment Strategies

	Where the learner is going	Where the learner is	How to get there
Teacher	Clarifying, sharing, and understanding learning intentions	Engineering effective classroom discussions, activities, and learning tasks that elicit evidence of learning	Providing feedback that moves learning forward
Peer		Activating learners as instructional resources for one another	
Learner		Activating learners as owners of their own learning	

Dylan Wiliam, *Embedded Formative Assessment* (2011)

CATHOLIC
MIDLEVEL
LEADERSHIP
ASSOCIATION

LEADERSHIP
IN ACTION

PRINCIPAL
ASSOCIATION
INDIANA

Varvara

Five 'key strategies' that support the implementation of effective formative assessment, Dylan Wiliam's book *Embedded Formative Assessment* (2011)

1. **Clarifying, sharing, and understanding learning intentions (blue)**, means getting students to really understand what their classroom experience will be and how their success will be measured.
2. **Engineering effective (green)** Teachers should develop effective classroom instructional strategies and involve as many students as possible to allow for the measurement of success.
3. **Providing feedback that moves learning forward (pink)**. Teachers should work with students to provide them feedback as a tool to improve students' learning. Feedback is only successful if students' learning improves, therefore teachers use formative and summative assessment o
4. **Activating learners as instructional resources for one another (beige)**. Teachers should develop strong routines where students support each other's learning in a serious structured manner.
5. **Activating learners as owners of their own learning**. Teachers should apply classroom tools and structure to enable students to monitor and regulate their own learning.

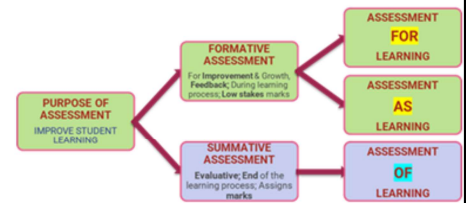
Sample Assessment Practices

- Quizzes as formative assessment
- Use of math journals as feedback for teachers and students
- Performance tasks (with collaborative components)
- Observation and recording of group problem solving
- Student presentations and discussions of mathematical thinking
- Collaborative design of assessment tools (such as rubrics) with colleagues and students
- Students recording their thinking on tablets
- Photographs or videos of student work on VNPS (white boards)
- Developing students' self- and peer-assessment

Chris

These are just a few assessment practices that have been observed in classrooms where teachers use a variety of assessments and encourage students to be involved in the assessment process.

Variety of Assessment Strategies



EX: Conversation/Interview summative

- Give students 10 summative problems at the start of the unit.
- Teacher teaches daily lessons with similar problems as focus
- When student feels ready to solve any of the summative problems they meet with teacher (during class, before/after school, lunch)
- Student can choose to solve any one of the summative problems any time through the unit and can have “do overs” as needed
- Teacher has hints and extensions ready to use to assess the students understanding of the solution they present

*gives students some feeling of ownership, with “do overs” students get specific feedback

*teacher reported having a deeper understanding and was able to articulate where each student was in their understanding and if they had any misconceptions

De

This is an example of what a grade 9 teacher did previously with a proportional reasoning unit in grade 9 applied. He created the summative first (10 rich problems) and gave it to students on the first day of the unit. Each day he taught as he normally did - he used a VNPS approach with similar problems that students worked on in groups. Students were encouraged to also work on the summative problems during consolidation time and for homework. When a student felt they could solve one the summative problems they arranged a time and presented their solution to the teacher (written or orally). The teacher had predetermined some hints and extension to probe the student to ensure they truly solved and understood the problem. Students reported that they really liked choosing when they were ready, the one on one time with the teacher and the probing questions to test their understanding. The teacher felt they better understood where each student was in their understanding (vs just a test at the end of the unit) and could see misconceptions better and could give better feedback to help each student.

Variety of Assessment Strategies

Ex: formative - student choice

- Teacher has a “practice” quiz/test divided it into different topic sections
- When “practice” quiz/test is returned, the room is set up with stations related to each topic section
- Students choose which stations to work at and for how long based on their performance and confidence on the “practice” quiz/test

*Gives students feeling of ownership, they decide what they need to work on

*Teacher can work in small groups, easy to add resource staff at stations

De

This is a real example from a teacher last quad in destreamed grade 9 math. She created a practice test for the unit and divided it into 5 sections. Students wrote the test and the next day she returned it to students to examine. On the day it was returned she divided the room into 5 stations that matched the sections of the test. Students were allowed to go to whichever station they wanted to revise and review solutions and complete additional practice for the test to improve skills. Resource staff and the “break” teacher were invited to be part of a station. As a result all the teachers in the room were able to provide small group instruction at each station.

Breakout Group:

How do I help teachers use a variety of assessment strategies?

- How have you responded to this question with your implementation?
- What questions/challenges do you still have?

Varvara



PURPOSE OF ASSESSMENT
IMPROVE STUDENT LEARNING

FORMATIVE ASSESSMENT
For Improvement & Growth; Feedback; During learning process; Low stakes marks

SUMMATIVE ASSESSMENT
Evaluative; End of the learning process; Assigns marks

ASSESSMENT FOR LEARNING

ASSESSMENT AS LEARNING

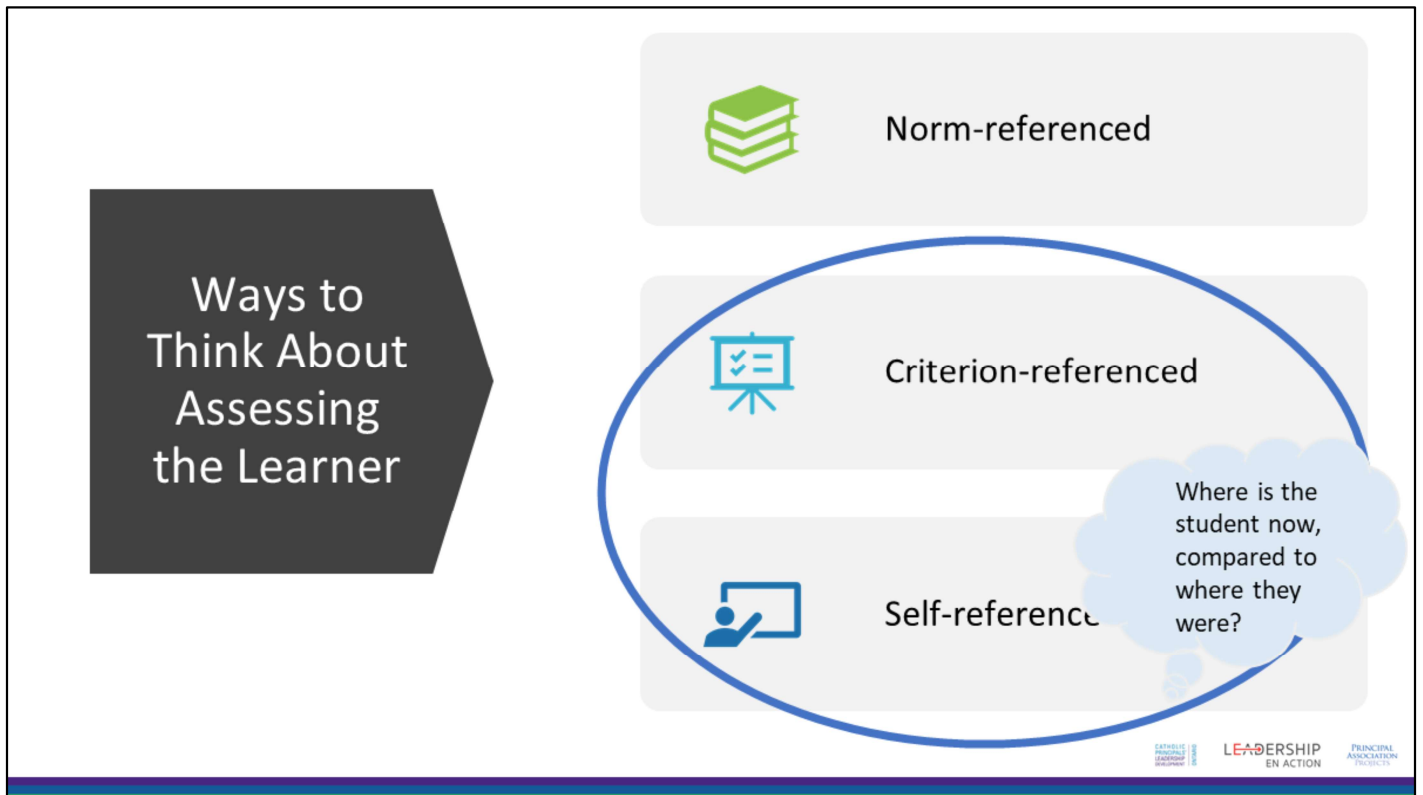
ASSESSMENT OF LEARNING

Putting it All Together

CATHOLIC PRINCIPALS LEADERSHIP ASSOCIATION **LEADERSHIP IN ACTION** PRINCIPAL ASSOCIATION PROJECTS

Chris

Although teachers may do many of the things we have talked about so far, they are often challenged to put all of their assessment data together when it comes to determine something like a mark on a report card or to provide some type of summative assessment of the student's achievement.



Chris

We have come a long way when we think about assessing learners. A long time ago assessment was focused on comparing one student against another with norm-referenced assessment such as assessing using a bell curve. Since then we have moved to criterion referenced assessment where we establish criteria, much like what you see in the Achievement Chart, in a teacher made rubric, or when developing success criteria. In this sense, it is clear to the student what the criteria are for them to achieve a certain standard (sometimes we call it a target). But it is also important to consider that not all students will hit that target at the same time. The lesson learning goal may not be achieved by all students by the end of the lesson. This suggests that sometimes we need to consider, not whether they reached the target, but by the end of the lesson, has their thinking moved? I consider this to be self-referencing, in other words, not considering where they are with respect to a particular target but where they are compared to where they were. And, this growth needs to be recognized - it provides the student with a sense of success and with a recognition that their thinking and growth is valued. And we know that success breeds success so we need to recognize and celebrate it for all students.

Sample of Classroom Assessment for a Grade 10 Student

	INC	R	1	2	3	4	Level
Quadratic Relations of the Form $y = ax^2 + bx + c$							
A1				OB5	T3	TK1 T4	
A2				TK5		T4	OB4
A3			OB5	TK4	T3	T4	OB6
A4			OB5	TK5	T3 TK4	T4	OB6
Analytic Geometry							
B1					TK1 OB6	T1	OB1
B2				TK2			OB2
B3					TK2		OB1
Trigonometry							
C1			TK3			OB3	
C2					TK3	OB6	
C3					TK3		
Term Level:							

Chris

This is an image of a teacher’s “mark book” for a particular student in Grade 10 (but this could be any grade). This is actually an image from a piece of software that helps teachers organize the pieces of evidence that they collect. This is just an image, but in the real software, each circle is interactive and if it is clicked on then more information will pop up. The blue circles that say “OB” stand for observations, the reds are for tests, and the green are for tasks. Along the left hand side are the overall curriculum expectations. You might notice that one assessment might provide evidence for several overall expectations such as OB5 which has assessment evidence for A1, A3 and A4. A teacher works with this data, and discusses this spread of data with the student to consider areas of improvement. Ultimately, the teacher uses their professional judgment and considers the most recent demonstrations of student understanding and ultimately considers what level or mark would best represent the students’ current achievement of the overall curriculum expectations.

Breakout group:

How do I help teachers see how to put together their assessment data to provide a fair and meaningful evaluation?

- How have you responded to this question with your implementation?
- What questions/challenges do you still have?

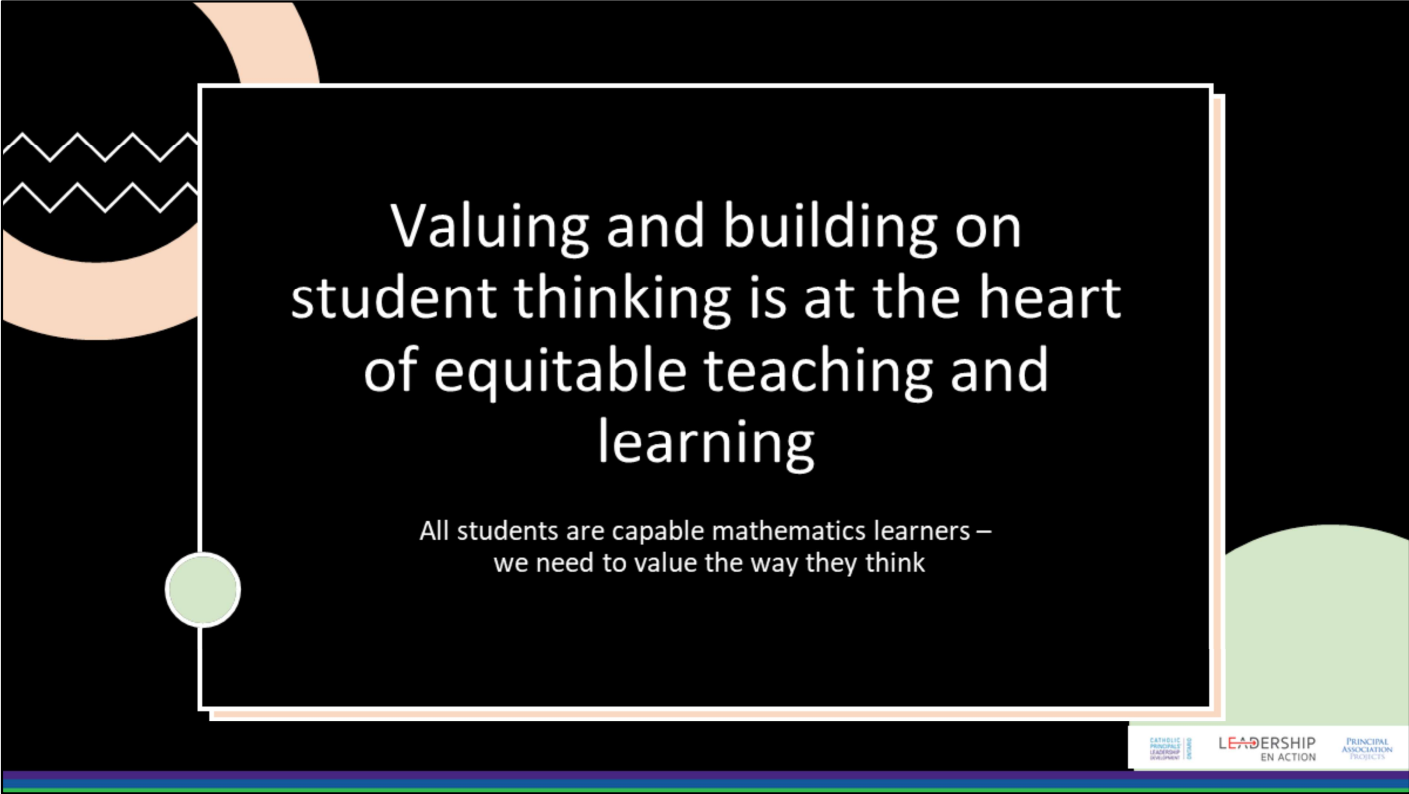


Providing Feedback on Assessment - Your Next Steps

What opportunity(ies) can you take in the next few days to offer feedback to your staff or a member of your staff during

- a classroom visit
- a walk through the school
- the next staff meeting
- in your weekly blog, memo, or newsletter
- ...

Varvara



Valuing and building on student thinking is at the heart of equitable teaching and learning

All students are capable mathematics learners – we need to value the way they think

Chris

Ultimately, assessment should improve student learning. However, if assessment is done poorly, assessment can demotivate learning, perpetuate inequities among students, negatively impact students' mental health, lower achievement, and heighten attrition rates. Using sound assessment practices values and builds on students' thinking - only then can we have equitable practices that see all students as capable mathematics learners.

Resources

[Building teacher and student capacity to think critically in math](#) - presentation by Laura Gini-Newman and Chris Achong, 2019

[Powerful Instruction and Powerful Assessment: The Double-Helix of Learning](#) by Garfield Gini-Newman and Laura Gini-Newman, 2020

[Quality Implementation: Leveraging Collective Efficacy to Make "What Works" Actually Work](#), Jenni Donohoo and Steven Katz, 2019

[Shifting to beliefs that empathize student strengths](#) graphic from

Strengths-Based Teaching and Learning in Mathematics, Kobbett & Karp, p.29

Suurtamm, C., & Arden, A. (2017). Using assessment to enhance mathematics teaching and learning. In D. Spangler and J. Wanko (Eds.) *Enhancing classroom practice with research behind Principles to Action* (pp. 141 -152). Reston, VA: NCTM.

<http://www.edu.gov.on.ca/eng/policyfunding/growsuccess.pdf> - Growing Success- Assessment, Evaluation, and Reporting in Ontario Schools, 2010.

Complete list of resources: https://docs.google.com/document/d/1rdlAdJeU_WIH9Zq9bnM-HD54AaZ9fW939Bs0vCSDWoQ/edit?usp=sharing



De

Gini-Newman slide show and paper supports example in first section on embedding assessment in instruction

Katz and Donohoo reference to help with ensuring quality implementation

Graphic supports mind shift to asset based approach

Christine's article about assessment in math

Growing success

Wrap Up

Thank you for being on this journey with us as we all implement the NEW grade 9 Destreamed Math course!

Please take a moment to complete the following surveys

1. PLN/RAP # 3 - [Meeting Evaluation Form](#)
2. [Summative Feedback Survey](#)

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Thank you....