

Elementary Math Focus Report

November 2017

Submitted to LCEEQ
Prepared by the EMF
Organizing Committee

Under the auspices of the LCEEQ Professional Development Subcommittee (PDSC), in collaboration with MaST, the Mathematics, Science and Technology Committee made up of the Math and Sciences Subject Consultants, the **Elementary Math Focus Project (EMF)** was initiated as a pilot project in August 2015. More than one hundred teachers and Mathematics Consultants from across the province were invited to participate in an intensive four-day residential professional development session held at Manoir St. Sauveur. The pilot originated from a proposal to offer a three-summer training to Elementary Math teachers. The pilot was conducted to ascertain whether the proposed animation team would be well-suited to meet the goals of the project.

Dr. Juli Dixon, University of Central Florida, one of the founders of DNA Mathematics (<http://www.dnamath.com>) and three of her colleagues were engaged to animate the workshops. The experience proved to be very successful. As a result, the three-year training model originally conceived was therefore fully endorsed by the community and LCEEQ. Participants in the pilot were invited to make a commitment for the subsequent two summers. Seventy percent agreed and have affectionately been known as “Cohort One” ever since.

School Boards/Associations were invited to commit to a long-term training model that would see participants attend sessions over three summers. In addition, participants would be provided with a minimum of two professional days of training by the local Consultant(s) during the regular school year following each of the summer sessions.

The original model designed to include three Cohorts of teachers would have seen the project continue through 2020. An agreement was reached with DNA Math, to deliver:

Summer 2015	Cohort One	Pilot	
Summer 2016	Cohort One	- Year Two	Introduce Cohort Two
Summer 2017	Cohort One	- Year Three	Cohort Two – Year Two
Summer 2018	Cohort Two	- Year Three	Introduce Cohort Three
Summer 2019	Cohort Three	- Year Two	
Summer 2020	Cohort Three	- Year Three	

Following the Summer 2016 workshops, the original plan was altered to introduce Cohort Three a year earlier to take advantage of the enthusiasm within the community. It must be noted that school teams were encouraged, thus opening the possibility of administrators joining the training process. The amended schedule became:

Summer 2017	Cohort One - Year Three	Cohort Two – Year Two	Introduce Cohort Three
Summer 2018	Cohort Two - Year Three	Cohort Three – Year Two	
Summer 2019	Cohort Three - Year Three		

The planning and organization of the EMF Project is the responsibility of the LCEEQ Professional Development Committee. The present members of the **EMF Steering Subcommittee** are:

- Cheryl Cantin, Elementary and Secondary Math Consultant – Eastern Township School Board
- Saba Din, Elementary and Secondary Math Consultant – Sir Wilfrid Laurier School Board
- Lisa Lorenzetti, Cycle 3 Elementary Math Teacher at The Study School representing QAIS/AJDS and facilitating the training for these Associations
- Franca Redivo, Ministry of Education - Direction des services à la communauté anglophone (DSCA)
- John Ryan, LCEEQ Coordinator

During 2016-2017 the Steering Committee convened nine meetings. In addition, several working sessions were held in which particular members focused on specific tasks (e.g. revise content proposed by the DNA team, order manipulatives for the Summer Institute...).

The Steering Committee organized a half-day workshop held on February 22, 2017 for in-school administrators to provide an opportunity for them to have a better idea of how they could support teachers. Also, they were invited to consider forming a school team, of which they would be a member, to register for Cohort Three which would be beginning in Summer 2017. The balance of the day had Dr. Dixon offering a workshop to Math Consultants.

In the Fall of 2016, School Boards/Associations were required to present a written three-year professional development plan as to how the teachers in the Summer Institutes, and eventually all Elementary Math teachers, would be supported in their ongoing learning of conceptual Math. Each Board, and a combined Quebec Association of Independent Schools (QAIS) and the Association of Jewish Days Schools (AJDS), submitted proposals to the LCEEQ Professional Development Subcommittee (PDSC).

In the Spring of 2017, the Boards/Associations were asked to submit a progress report on what was accomplished during the school year. A summary of the reports follows. It should be noted that the New Frontiers School Board opted into the project with the initiation of Cohort Three since the Board already had a Math initiative in progress. That is the reason their PD plan begins with Summer 2017 and is not included on the summary chart.

<u>CSL</u>	<u>CQSB</u>	<u>EMSB</u>	<u>ESSB</u>	<u>ETSB</u>
<p>For SI teachers:</p> <ul style="list-style-type: none"> • Ongoing VC sessions from Nov. 2016 monthly through to June 2017 • Collaboration between teachers with ESSB to do co-planning in Nov. 2016 • Modeling and team-teaching in multiple schools in Jan. 2017 • Webinar possibly offered in April 2017 (to be confirmed) 	<p>For SI teachers:</p> <ul style="list-style-type: none"> • 1-day follow-up session with Cohorts 1 and 2 teachers <p>For all teachers:</p> <ul style="list-style-type: none"> • In-school PLCs (for both SI and non-SI teachers) • 2-day training for Cycle 1 and 2 teachers in schools (on modeling instruction) • PED day session for Cycle 1 and 2 teachers in Oct. 2016 	<p>For SI teachers:</p> <ul style="list-style-type: none"> • ½ day workshop in October 2016 • Full day workshop in February 2017 • ½ day workshop in May 2017 <p>For all Cycle 1 teachers:</p> <ul style="list-style-type: none"> • 3 days of release for PD on teaching math conceptually 	<p>For SI teachers:</p> <ul style="list-style-type: none"> • 2 days per teacher for individual support • 1-day follow up with all teachers offered over 2 days in April 2017 	<p>For SI teachers:</p> <ul style="list-style-type: none"> • 2 full days of PD for Cohort 1: Nov. 2016 and Feb. 2017 • 2 full days of PD for Cohort 2: Sept. 2016 and Jan. 2017 <p>For all teachers:</p> <ul style="list-style-type: none"> • In-school PLCs (for both SI and non-SI teachers) with meetings at least once per month • Bimonthly visits and support for each school <p>For administrators:</p> <ul style="list-style-type: none"> • Bimonthly sessions focused on math pedagogy

<u>LBPSB</u>	<u>QAIS/AJDS</u>	<u>RSB</u>	<u>SWLSB</u>	<u>WQSB</u>
<p>For SI teachers:</p> <ul style="list-style-type: none"> • 2 full days of PD for Cohort 1 and 2 (dates not indicated) • Scheduled classroom visits for individual support for each SI teacher in Cohort 1 and 2 	<p>For SI Teachers:</p> <ul style="list-style-type: none"> • 2 full days of PD for all SI teachers (dates not indicated) • Each teacher provided with Making Sense of Math for Teaching (DNA book) for their level <p>For all teachers:</p> <ul style="list-style-type: none"> • 1 ½-day workshop and 1 full day workshop for elementary and secondary cycle 1 teachers (dates not indicated) • Release time offered to teachers interested in participating in classroom visits 	<p>For SI teachers:</p> <ul style="list-style-type: none"> • 2 full days of PD for Cohort 1 (dates not indicated) • 2 full days of PD for Cohort 2 (dates not indicated) • 6 ½-day releases for Cohort 1 teachers • 6 ½-day releases for Cohort 2 teachers • Schools visits and in-class support <p>For all teachers:</p> <ul style="list-style-type: none"> • Project with 13 teachers and 5 days of release for PD and in-class support 	<p>For SI Teachers:</p> <ul style="list-style-type: none"> • 2 full days of PD for all SI teachers: Oct. 2016 and Mar. 2017 • Monthly PLC meetings and classroom visits with smaller group of SI teachers <p>For all teachers:</p> <ul style="list-style-type: none"> • 3 full days of PD for teachers new to teaching math • Support to teachers and in-school PLCs <p>For administrators:</p> <ul style="list-style-type: none"> • 2 full days of PD on math pedagogy: Sept. 2016 and Mar. 2017 • Monthly PLC meetings focused on support/leading math PLCs in schools 	<p>For SI teachers:</p> <ul style="list-style-type: none"> • 2 full-day PD for all SI teachers in Nov. 2016 • 1 full-day session in Spring 2017 • School visits to observe teachers' practice of SI lessons <p>For all teachers:</p> <ul style="list-style-type: none"> • Ongoing support to schools

At the end of each Summer Institute the Steering Committee reviews feedback provided by participants gathered in on-line surveys. In August 2016, for example, there were three strands offered: K-2, 3-5 6-8. The extension to Grade 8 was to accommodate Secondary School participants. What occurred was that the content for 3-5 was primarily 3-4, while the 6-8 took on a secondary school focus leaving many of the Elementary Cycle 3 teachers (Grade5-6) caught between.

After this gap was identified, the Consultants on the Steering Committee opened a dialogue with the DNA team to restructure the grade bands and content to better meet the needs of Quebec elementary school teachers. The DNA team created a revised content (decimals) for August 2017 based on our discussions. This content seemed to be positively received by the teachers.

The following grade bands were offered in August 2017: K-2, 3-4, 5-7. It should be noted that Secondary School teacher participants were not happy that the content was returned to a greater focus on Cycle 3 elementary. These teachers were reminded that their invitation to be part of the EMF project was always intended to be from a “*Response to Intervention*” (RTI) perspective. It was not supposed to be from a Secondary School content perspective. The majority of Secondary teachers returned, the Feedback Survey from August 2017 included requests for Secondary School content.

As mentioned previously, an online survey is conducted at the end of each Summer Institute. The response to the August 2017 questionnaire was most encouraging given the number of respondents (Cohort One was 55.2%, Cohort Two was 70.8%, Cohort Three was 78.0%) and the information gathered. The compiled results of the survey are found in the annexes of this report.

It can be readily understood that a project of this nature and scope is a major undertaking and a costly endeavour. Given that participants are giving up part of their summer vacation every effort has been made to ensure high quality workshop sessions in a comfortable environment. Arrangements have been made with Manoir St. Sauveur to offer special rates to family members so that many of the participants can take advantage of being accompanied by family and friends during their stay. All expenses were covered for participants choosing double occupancy while those opting for single or family occupancy were expected to cover the difference.

Although all funding is made possible by the Canada-Quebec-Agreement, at present, the project is financially supported by two budgets. LCEEQ is responsible for defraying the cost of the animation team, while a Ministry Math and Sciences budget covers costs related to accommodation and materials.

The following is an overview of the cost of the Summer 2017 session:

Animation: There were nine animators needed to accommodate three Cohorts (a total of more than 350 participants in the combined three Cohorts. Five animators were in attendance for five days, while four additional animators were required for two days.
Cost: **\$160 000.**

Accommodation/Meals \$248 000.

Travel subsidy for those at a distance \$45 000.

Materials \$ 8 500. (five thousand dollars of manipulative materials were distributed to the schools following the workshops)

The total for the August 2017 Summer Institute: \$462 000.

Considering that there were roughly 350 teachers and Consultants involved, the overall cost was approximately thirteen hundred dollars per participant.

Appendix A

Summary of the Feedback from Cohort One – Math Summer Institute 2017

Number of respondents: **n= 37** (55.2%)

	Excellent (1)	(2)	(3)	(4)	Poor (5)	Comment
Experience booking accommodations	22 59.5%	13 35.1%	1 2.7%	1 2.7%		<p>I am not too computer savvy so registering on line was a challenge – the help offered by the organizers was appreciated</p> <p>In year 3 we had to book ourselves and that is not fun – but it was simple</p>
How would you rate accommodations	30 81.1%	5 13.5%	1 2.7%		1 2.7%	<p>This year I was not in the main building and did not feel safe on the first floor of the one I was in. In addition, there were issues with the room (e.g. remote needed batteries)</p> <p>The room smelled of smoke</p> <p>There was an issue with charges on departure but it was solved</p> <p>I wish my 14-year olds would have been allowed in the spa section after 6:00 PM</p>
How would you rate the meals	21 56.8%	12 32.4%	3 8.1%	1 2.7%		<p>The last year the meals were not that great compared to the first 2 years</p> <p>I would have like to have been able to eat some meals outdoors as in previous years (2)</p> <p>There were not enough snacks provided for everyone</p>

Note: Participants who rated a 3 or greater were asked to comment

	Excellent (1)	(2)	(3)	(4)	Poor (5)	Comment
How would you rate the breakout session room	24 64.9%	11 29.7%	1 2.7%		1 2.7%	Temperature of the room was cold (2)

	Strongly Agree	Agree	Doubtful	Disagree	Strongly Disagree	Comment
I received all the information required regarding the Math Summer Institute	29 78.4%	8 21.6%				
I received the information regarding the Math Summer Institute in a timely manner	29 78.4%	8 21.6%				
The goal of this PD experience was clear to me prior to my arrival	30 81.1%	7 18.9%				
Mathematics is something I'm good at	14 37.8%	21 56.8%	2 5.4%			

If you were to observe another teacher's math classroom for one or more lessons, what are three (3) things you would look for in order to decide whether or not the instruction is of high-quality?

Response ranked by frequency:

- ✓ Student engagement
- ✓ Rich questioning
- ✓ Use of manipulatives
- ✓ Math talk
- ✓ Showing/Using multiple strategies to solve a problem
- ✓ Students talk more than teacher
- ✓ Students discuss/explore concepts
- ✓ Clarity of explanation
- ✓ Clear learning objectives
- ✓ Students justify their answers and those of others
- ✓ Process over right answer

- ✓ Time for exploration – not giving answer or how to do it
- ✓ Teacher observation
- ✓ Student directed lesson(s)
- ✓ Type of tasks and task selection
- ✓ Verifying understanding
- ✓ Acceptance of student ideas
- ✓ Accessible activities with varying complexity
- ✓ Math centers
- ✓ Evaluation
- ✓ STEAM
- ✓ Straight face

Please indicate how often you invite student-invented strategies prior to teaching an algorithm or procedure:

All the time	7	18.9%
Often	22	59.5
Sometimes	7	18.9
Rarely	1	2.7

In your current context, for every ten (10) lessons you teach, on average, in how many lessons are the students using manipulatives

1-2 times	5	13.5%
3-5 times	11	29.7
6-7 times	10	27.1
8-10 times	11	29.7

Briefly list and describe some factors that influence how often manipulatives are used in your lessons

Response ranked by frequency:

- ✓ Time
- ✓ Availability
- ✓ Topic/content
(Frequent response to the first three)
- ✓ Students always encouraged to use
- ✓ Visible and part of classroom culture
- ✓ They provide a sense of comfort
- ✓ As a Resource Teacher I see the need for them and try to encourage the classroom teacher to use them
- ✓ The more I use them the more comfortable I am – I see deeper understanding when I use them
- ✓ Some students are visible learners
- ✓ Once used they can deal with abstract – if not I bring them out again

	Strongly Agree	Agree	Doubtful	Disagree	Strongly Disagree	Comment
The content of the workshops at the Summer Institute was representative of my needs as a Mathematics teacher	23 62.2%	12 32.4%	1 2.7%	1 2.7%		
The amount of content in the breakout sessions was appropriate	23 62.2%	13 35.1%	1 2.7%			
The pacing of the breakout sessions was appropriate	18 48.7%	17 45.9%	2 5.4%			

If you disagreed with any of the statements, please indicate why:

- I think we spent too much time on some activities, but by the 3rd year, that did improve.
- I was in the grades 5-7 sessions and I felt the content was beyond what I teach my grade 5 students, and even grade 6.
- I would have appreciated more lessons for my grade.

How would you rate the presenter’s facilitation of your breakout session?

Presenter	Number of respondents	Excellent (1)	(2)	(3)	(4)	Poor (5)
Thomasenia Adams	8	62.5%	25.0%	12.5%		
Brian Dean	2	100%				
Ed Nolan	16	56.3%	43.7%			
George Roy	11	54.5%	36.4%	9.1%		
Total	37					

What feedback could we give the presenter in your breakout room to improve your experience in the future?

Brian Dean: Nil

Thomasenia Adams:

- I found the third year to be more engaging than the first year. She seemed less tense, or it could have been me.
- Each year I was with Thomasina she was stronger and inspiring!
- Our session had a table of teachers who constantly talked among themselves during Thomasina's presentation. It took another teacher to ask them to be quiet. It would have been better if Thomasina had addressed the group right away. Otherwise I thoroughly enjoyed all 3 years with Thomasina and benefitted from her expertise.
- Thomasenia was fantastic. I wouldn't change anything.

Ed Nolan:

- Quicker pace (2)
- His presentation style was great. We were engaged the whole time. He did on occasion go off on 'tangents' sharing stories or experiences or strategies that veered off topic a little, but was always able to bring it back. This however did affect the flow at times.
- I know how valuable group discussions are, however, they can also sometimes get in the way of our learning more content...the pace could have been faster if the discussions would have been cut shorter.
- keep up the good work
- More lesson ideas

George Roy:

- None, he had a great balance of humour and charisma to deliver the concepts in an interesting manner. The time flew by!
- George was fantastic. I have no constructive criticism for him.
- I felt that the presenter improved every year. I do prefer the way Number Talks allow students to let the teacher know if 1) they are understanding and 2) if they would like to share. Sometimes people felt 'on the spot'. With many people having math phobia, teachers included, I think teachers and students, alike, must feel safe, and Number Talks allows that.
- More lessons that are appropriate for cycle 2 students.

Consultant led Workshops (Wednesday session)

	Rate the facilitation	The content of the Wednesday consultant-lead session was appropriate and met my needs
Developing a Plan for Student Learning N=18	Excellent (1) 1 5.6%	Strong Agree 1 5.6%
	(2) 7 38.9%	Agree 6 33.3%
	(3) 7 38.9%	Doubtful 7 38.9%
	(4) 3 16.6%	Disagree 3 16.6 %
	Poor (5)	Str. Disagree 1 5.6%
Developing and Evaluating Competency N=19	Excellent (1) 3 15.8%	Strong Agree 3 15.8%
	(2) 7 36.8%	Agree 9 47.3%
	(3) 4 21.1%	Doubtful 3 15.8%
	(4) 3 15.8%	Disagree 3 15.8%
	Poor (5) 2 10.5%	Str. Disagree 1 5.3%

What feedback could we give the presenter(s) of the Wednesday consultant-lead session to improve your experience in the future?

Developing and Evaluating Competency 1: Solving a Situational Problem

- It wasn't the presenters. It was more the content seemed a little basic, especially since this was my third year at the symposium. The planning strategies were nothing new (backward design, long term vs short term...). I was expecting something a little more specific to how to plan a TQE lesson or classroom, tips on how to manage time constraints and parent worries, things that were more specific to the 'out-of-the-box' nature of the teaching approaches seen during the symposium over the three years but it was more on broad planning strategies that were a little too obvious for me
- Enjoyed the discussion rating the descriptions as strong or weak examples. Appreciated that there was not a "correct" answer, it was up to the room to decide, but would have liked the presenters to weigh in with a bit more of their own opinions
- Need hands-on ideas to take back to our classroom
- Not straight to the point. Not organized
- We were seated at the back of the room. The PowerPoint was too far away to see clearly and the sound was too low to hear anything clearly. It was discouraging. The first speaker basically read a document that we received. Other speakers gave interesting information that was not on handouts. It was difficult to hear him and take thorough notes about his topic. Altogether, it was a frustrating session that felt like time wasted.
- We (teachers) did not need to spend time reviewing the QEP. I expected a more hands-on approach to problem solving situations. I got the impression that the presenters had not coordinated their presentation beforehand.
- Maybe separate group always according to the grade taught
- too much focused on just looking at the QEP and reading from the MELS documents, not at all what expected
- I thought the consultants did a good job and made themselves available as supports.
- Keep up the good work - presenters were very dynamic

Developing a Plan for Student Learning (Purposeful Planning)

- More hands-on activities were necessary.
- More advanced content
- More examples and concrete things to use in the classroom (2)
- Maybe separate group always according to the grade taught (2)
- Spend more time focusing on how to come up with planning lessons

- The instructions for small group discussion and activities could have been clearer and/or on a slide. There was a lot of digression/confusion about what we should have been talking about. Also, presenters could have been better prepared to steer the conversation back on track when participants got on a tangent about government exams that wasn't relevant to the discussion.
- I think after the training, we could have used our time better by meeting with teachers of the same grade level to begin developing math lessons.
- Not straight to the point. Not organized
- Rather than having participants solve problems, use actual student examples and analyze it as a group to show participants how teachers could approach their needs and create a plan
- To have the handouts of their power point available. This would have been easier to follow and write notes. The presenters did send the power point notes after the workshop after many asked for them. Also, the group next door was so noisy that it was at times difficult to hear.

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- Speed up the feedback from teachers after the activity. I found it took a really long time to place the activities into the categories we chose. I also kind felt like it was a presentation to give before the institute, not at the end of the 3 years. It felt like a waste of time.
- Keep up the good work (2)
- Make this session mandatory for all teachers !! ;) It really was excellent.
- I thought our presenters were very dynamic

What support mechanisms do you feel your school board could provide to help you continue to grow professionally after this PD experience?

- Use of situational problems
- Opportunities for networking and sharing materials
- Manipulatives for the classroom
- Class visits (4)
- Workshop with the people who attended the math institute to talk about ideas that we used in our classroom and what was good or bad about it so we can have a bigger bank of ideas to use in our own classrooms
- Have follow-up meetings (again according to grade taught) (3)
- Check-ins (email)
- Well, we have our Edmodo group and have workshops set up for ped. days to consolidate our learning, so I'm glad for that.
- Opportunities to stay connected with each other throughout the year.
- More sessions which model the teaching of the content using best practices
- It would be helpful to watch videos of teachers from around our board implementing the DNA approach.
- To continue doing workshops on how to use the manipulatives properly. To find other ways in doing the math talk.
- More workshops on the concepts discussed
- Help with lesson ideas. Planning with big ideas in mind.
- Create a network of teachers who understand and the training we received and offer opportunities to meet once or twice a year to continue to learn, share, discuss
- My board offers monthly PLC meetings as well as twice-yearly meetings for all MATH focus participants. I feel that I am well supported in my PD.
- Release time to meet with other teachers and plan. Eliminate standardized testing so that there isn't pressure to rush through the curriculum by April.

- make sure all teachers of math are comfortable teaching the material - what has come before influences what I do with my group in any given year
- Other math workshops....resource books
- My school board already does a good job of supporting professional growth in the teaching of math. I look forward to continued professional development throughout the coming year.
- follow up meetings with our consultant and other teachers who have attended
- Help with small PLC type networks, Setup opportunities for modeling and reflecting with a partner. Team teaching opportunities to practice TQE process and come up with tasks that pan grade levels.
- classroom observations and continued feedback
- Half a day release once or twice per year to discuss and share ideas and resources.
- Continued opportunities to share with others who have attended the conference to reinvigorate me mid-year.
- time to collaborate with people from the other schools same grades, visit other classes and watch how they approach their math lessons
- Continue the conversation with my peers whether through webinars, ped day training, release time or forums. Hearing what others are doing is always great especially if the consultant is there to hear it all and support us through our challenges.
- Ongoing discussions with math consultants in varied contexts to continue to enrich my understanding, despite the fact that I no longer have a math class.
- We are small and don't have "math consultants" other than subject reps that are also full time teachers, and we are only one class per grade at my school, so learning community opportunities are more rare and difficult to orchestrate.
- More hand-on workshops. (2)
- follow-up days and group discussions and sharing of strategies. Visiting other teachers' classrooms or filming lessons that go well!
- Professional development!!!
- We are an isolated school. We hardly ever interact with other teachers from our board. It would be helpful to be able to have open round table meetings with teachers that teach math at our level.
- Revisit the notions learned

From the list of teaching practices below, which three would be your top priority for professional development?

Teaching Practice	Indicated as first choice	Indicated as second choice	Indicated as third choice
Representing student thinking and key ideas	14	-	-
Orienting students to each other's ideas	4	1	-
Recognizing students as competent contributors towards developing understanding	8	2	-
Eliciting and responding to student thinking	7	9	-
Designing and facilitating rich math activities that allow for student sense-making	4	20	11
Establishing and maintaining expectations for student participation	-	2	5
Identifying and teaching towards an instructional goal	-	-	14
Other:			
Time to do it all and plan	-	1	-

What content should be the focus of future PD (i.e. what content area or curricular goal(s) do you feel least prepared to teach conceptually?

- Situational problems (6)
- Geometry and probability (3)
- designing and facilitating rich math activities (3)
- Operations with fractions (3)
- Facilitating discussions
- Place value
- More of the potential misconceptions of students - what to anticipate.
- Articulating the concepts in a clear manner and providing examples of how to guide students to their sense-making.
- Improving teacher clarity
- Linear Relations
- Exponents
- Time and measurement
- Metric conversion
- Money
- Exploring (not yet solving) situational problems. The last workshop on Wednesday was great, but I feel that I will have questions as I apply what I've learnt.
- Planning with big ideas in mind
- Evaluating problem solving situations
- Teaching, planning with big ideas in mind and lessons focused on those big ideas
- Decimals (2)
- Skip counting (Grade 1)
- Long division
- Algebra
- STEAM
- As I have not had an opportunity to put much into practice, I am not sure which areas I feel less prepared for (2)

- Social Studies
- I would also love LCEEQ to create a similar institute for ELA instruction.

Is there any other feedback or recommendations that you wish to provide the organizing committee?

- Thank you for a well-structured experience that has impacted my teaching positively (2)
- Keep doing what you're doing, it is SO valuable and the more teachers you can reach the better off our students will be!
- Is it possible to receive certificates to indicate that we have completed the 3 year program? It would be awesome to be able to return for another year or participate in a different grade grouping next year.
- The 1st year I felt that we were shown one or two activities per unit and I would prefer now, to go in depth with one unit of study.
- This is a suggestion.....That the hotel rooms should be given in priority to when you booked in the winter and not upon the arrival at the hotel.
- Everything was great. Thank you again for having this workshop. I learned so much and this made me a much better teacher. I have changed my way of teaching . I wish this was given 20 years ago.
- It was the best PD experience I've had in my 10 years of teaching. Thank you!
- You need to try to get teachers who are not comfortable with Math into these sessions
- This PD institute has been one of the most enriching experiences of my career. It reinforced all that I had learnt in my teacher training and reminded me of what I needed to bring to my students. All teachers of mathematics should attend this institute. I am glad to know my school board is planning several PD days to share the Math Focus ideas with teachers that have not attended the summer institute. It is import for these strategies to be taught throughout a school to ensure consistency for students.
- I have been so impressed with the quality of the PD at the summer institute and with how well organized everything always is. Thank you so very much!

Appendix B

Summary of the Feedback from Cohort Two – Math Summer Institute 2017

Number of respondents: n= 97 (70.8%)

	Excellent (1)	(2)	(3)	(4)	Poor (5)	Comment
Experience booking accommodations	59 60.8%	29 29.9%	6 6.2%	3 3.1%		<p>Hotel reception was very bad. Unorganized and too much wait. It seems that the event is too big for the capabilities of managing arrivals and departure. Rooms are not ready or not what you specifically asked for. Very disappointing since we book a good 7 months in advance. You would think they would be more organized and ready to accommodate this big convention.</p> <p>I called two weeks before to make changes to my reservation and getting in touch with person in charge was difficult. Phone calls were supposed to be returned and they were not. When I finally reached the person, I was told to do the switch over the internet.</p> <p>Better response/customer service from the Manoir</p>

<p>How would you rate accommodations</p>	<p>52 53.6%</p>	<p>32 33.0%</p>	<p>9 9.3%</p>	<p>3 3.1%</p>	<p>1 1.0%</p>	<p>The room I had the first year was a very nice, clean room. This year, my room was an older non-updated room and it did not smell...fresh. I was disappointed in the fact that my colleagues and I all paid \$75 to have our own room, and each of our rooms were different.</p> <p>The room was great, but the pull-out bed was extremely uncomfortable.</p> <p>Our room had a musty/damp smell.</p> <p>I was very disappointed this year with the room accommodations. I had reserve my private room the first day we got the email in early 2017 and got a horrible room. I had to ask to be moved because it was awful.</p>
<p>How would you rate the meals</p>	<p>50 51.5%</p>	<p>38 39.2%</p>	<p>6 6.2%</p>	<p>3 3.1%</p>		<p>The food seemed to be not a good as the week went on</p> <p>There were not enough snacks provided for everyone (2)</p> <p>The food was good but not enough gluten and vegetarian meal options</p> <p>Vegetarian options were limited or repetitive (or IF there was a warm meal for vegetarians other than steamed veggies, it had always run out).</p>

Note: Participants who rated a 3 or greater were asked to comment

	Excellent (1)	(2)	(3)	(4)	Poor (5)	Comment
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How would you rate the breakout session room	38 39.2%	52 53.6%	6 6.2%	1 1.0%		<p>Temperature of the room was cold (4)</p> <p>Break-out room were not sound proof, we could hear the other room</p> <p>It would be nice to work with teachers I was with last year.</p> <p>Break-out room location was too crowded for the amount of people on break at the same time.</p>
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	Strongly Agree	Agree	Doubtful	Disagree	Strongly Disagree	Comment
I received all the information required regarding the Math Summer Institute	76 74.8%	20 20.6%			1 1.0%	
I received the information regarding the Math Summer Institute in a timely manner	74 76.4%	20 20.6%	1 1.0%	1 1.0%	1 1.0%	
The goal of this PD experience was clear to me prior to my arrival	64 66.0%	27 27.9%	4 1.0%	1 1.0%	1 1.0%	
Mathematics is something I'm good at	27 27.8%	54 55.7%	16 16.5%			

If you were to observe another teacher's math classroom for one or more lessons, what are three (3) things you would look for in order to decide whether or not the instruction is of high-quality?

- ✓ Math talk, (11)
- ✓ student engagement , (44)
- ✓ use of manipulatives (30)
- ✓ lots of visuals
- ✓ manipulatives versus worksheets
- ✓ concept taught before procedures (2)
- ✓ Evidence of student learning (9)
- ✓ teacher not providing students with all the answers, (3)
- ✓ Student comfort with making mistakes,
- ✓ students listening to each other (6)
- ✓ meaningful tasks (4)
- ✓ hands-on exploration (2)
- ✓ class discussions being facilitated by the teacher but led by the students. (9)
- ✓ clear and stated goal (15)
- ✓ good questioning (19)
- ✓ TQE process (5)
- ✓ control
- ✓ student questioning (3)
- ✓ clear explanations
- ✓ low anxiety (2)
- ✓ students tie new learning into prior knowledge
- ✓ movement/students in action (3)
- ✓ evidence of teacher planning (2)
- ✓ various strategies to answer the questions (8)
- ✓ if the kids are enjoying the lesson,
- ✓ if the kids are taking risks (2)
- ✓ problem solving strategies (3)
- ✓ lots of thinking
- ✓ Allowing students to discover (5)
- ✓ teacher knowledge (3)
- ✓ teacher enthusiasm (2)
- ✓ No right wrong answer approach
- ✓ quick ways to check for understanding and that allows for modifications to lesson (2)
- ✓ optimal time for student reflection/exploration (9)
- ✓ rich and varied activities (3)

- ✓ students actively creating their own learning (6)
- ✓ Sense making (5)
- ✓ Guided learning
- ✓ good teacher facilitator (2)
- ✓ a collaborative environment (3)
- ✓ lessons that bring math misconceptions to the forefront

Please indicate how often you invite student-invented strategies prior to teaching an algorithm or procedure:

All the time	9	9.3 5%
Often	48	49.4
Sometimes	35	36.1
Rarely	5	5.2

In your current context, for every ten (10) lessons you teach, on average, in how many lessons are the students using manipulatives

Zero	1	1.0%
1-2 times	20	20.6
3-5 times	27	27.8
6-7 times	24	24.8
8-10 times	25	25.8

Briefly list some factors that influence how often manipulatives are used in your lessons

Response ranked by frequency:

- ✓ Availability (32)
- ✓ Topic/content (15)
- ✓ Time (14)
- ✓ Need more ideas/help on how to use them in the classroom (14)
- ✓ Visible and part of classroom culture (10)
- ✓ Students always encouraged to use (7)
- ✓ Students need (2)
- ✓ Some are time consuming and energy requiring (2)
- ✓ Not all students want to use them, but they are always available
- ✓ Provide for better understanding
- ✓ Number lines require preparation with more difficult intervals (prior to lesson).
- ✓ I teach Gr9, 10 and 11 and for these groups the tool I rely on more for the purpose of investigation is Geogebra.
- ✓ I teach at the high school level and the manipulatives that I use need to add something valuable to the lesson to warrant its use, otherwise it becomes a distraction. There may be manipulatives that would be more appropriate of which I am unaware.

	Strongly Agree	Agree	Doubtful	Disagree	Strongly Disagree	Comment
The content of the workshops at the Summer Institute was representative of my needs as a Mathematics teacher	32 33.0%	52 53.7%	11 11.3%	1 1.0%	1 1.0%	
The amount of content in the breakout sessions was appropriate	35 36.2%	52 53.6%	8 8.2%	2 2.0%		
The pacing of the breakout sessions was appropriate	33 34.0%	57 58.8%	6 6.2%	1 1.0%		

If you disagreed with any of the statements, please indicate why:

- The range of philosophy and distance travelled down this shift paradigm was wide
- Too much material is covered
- I teach grade 5 and the majority of what was presented was above the level of what I teach. I was looking for multiple ways to present material and that was not discussed. I loved the first year and if the groupings stay the same for next year, I hope I can be placed in the lower grade level. I think that this year the pace was slow, since we already had one year done, we knew the essence, so the speaker could have gone faster on the first day
- I did not disagree, but I did hear a few teachers "complain" about learning integers, saying this is not covered in grade 6; I strongly disagreed with them as I believe it is essential to know what the students will be learning in the future so we can prep ourselves and prepare the students accordingly
- Too much time spent on one thing
- This year I was not able to change groups to Cycle 1. I found out in June that I was going to be teaching grade 2 and I was kept in the Cycle 2 grouping. I know I can modify what I learned, but I would've appreciated being in Cycle 1.
- I do think that we could have had more content. Because we had a very vocal group, we learned from each other, I am glad that the design of the session gave us that chance to share ideas.
- The focus this year removed the grade 8 level which was the most useful to me. As a math specialist the concepts being taught were not a struggle, but for others in the session they were. This really slowed down the overall pace to instruction.
- Although I didn't disagree, I found some of the sessions a little slow at times.
- We had one session dedicated to decimals that was too advanced for my grade level.
- I would have enjoyed an extra day of breakout sessions and more hands-on activities.
- I do not disagree but would like to get more 'ready to use' lessons sorted by topics
- I would like to see sessions devoted to secondary level math classes
I have many high needs, lack of time/ money to prepare lessons and centre activities /
I found that the breakout session was too much information and the presenter seemed to be following a script and if a question was asked not related to the topic he did not really want to address it
- I think we could spend more time in the sessions
- The first year, I received a lot of information and was able to start on a fresh start I had a lot of material and ideas. I find that in year 2 I received less. I wish I had ideas for fractions, but was told I will in year 3. I am in grade one but work often with a grade 6 teacher and we try to find ideas together to go deeper with the students. When I was in my breakout session, teachers discussed different things done in their classroom and this was very resourceful, great ideas for games. Maybe we could have gone deeper. I don't know but I already put one of the ideas shared and is a success right now. It just wasn't as engaging this year. It felt like the SAME things we saw last year... Just a review and pushing it a little further

How would you rate the presenter’s facilitation of your breakout session?

Presenter	Number of respondents	Excellent (1)	(2)	(3)	(4)	Poor (5)
Lisa Brooks	12	75.0%	25.0%			
Melissa Carli	15	53.3%	33.3%	13.4%		
Brian Dean	21	33.3%	38.1%	28.6%		
Juli Dixon	13	84.6%	15.4%			
Tashana Howse	12	25.0%	75.0%			
Farshid Safi	22	86.4%	13.6%			
Total	95					

What feedback could we give the presenter in your breakout room to improve your experience in the future?

Lisa Brooks:

- She could include more content and keep a faster pace.
- Lisa was fantastic. I wish we had more time with her. I found that we lacked time to cover all the topics.

Melissa Carli:

- Great job! More time practicing new concepts.
- have more hands-on activities
- Needs to speak a little louder.
- Share more concrete ideas. Loved the number line we created!
- less wait time to cover more topics

Brian Dean:

- Having access to the slides before our arrival
- He was an enthusiastic presenter but unwilling to answer questions that were not in his prepared presentation
- Make sure people are more respectful/quiet (reduce chatter), more hands-on things to use concretely in the classroom (involvement)
- It was described as a Grade 5 - 7 level, yet the content covered seemed more to be at a Grade 7 level. I would have preferred more activities at the Grade 5 & 6 level.

- He could accelerate the pace a little (leave less time for us to answer or execute the tasks...)
- Lots of charting during presentation. Content was more geared towards HS and I teach 6th grade. As a result, I felt I left and had less hands-on material to use in my classroom.
- Pacing was a little slow, too many examples
- Since I am teaching younger students, I felt that he was explaining for high school. But he was able to bring it back for elementary
- Take the time to listen to the teacher's concerns and address them even if what they ask is not in the script he is following.

Juli Dixon:

- Just plan less time for the first part so we can finish all the module.
- Some of the content was above my students' understanding. However, it did help me to feel like a student. Also, I would like to see more student misconceptions that I should be teaching.
- At times I felt the pace could have been quicker (2)
- Everything was excellent, however not enough time to cover all material
- I wish we had more time to cover other topics!
- Better technology equipment for her to use. This wasn't her fault

Tashana Howse:

- Do more hands-on activities.
- Give more examples that would be age-appropriate for the students of the teachers attending the session
- We were a little behind the other groups so we covered less material
- Although we had hands-on activities, we needed to practice more teaching the lesson.

Farshid Safi:

- Since the general feeling was that it was a "repeat" of last year, maybe he could have explored geometry or probability or pre-algebra more
- Make sure that teachers did not receive the same information/training as previous year (I was in the grades 3-5 session last year and the 5-7 session this year. In both years we spent a lot of time on area models. I would have liked to have learned a different concept).
- More group activities?

Consultant led Workshops (Wednesday session)

	Rate the facilitation	The content of the Wednesday consultant-lead session was appropriate and met my needs
I heard someone say... Now What? Digging Deeper into Classroom Discussions N=40	Excellent (1) 13 32.5%	Strong Agree 11 27.5%
	(2) 23 57.5%	Agree 25 62.5%
	(3) 4 10.0%	Doubtful 4 10.0%
	(4)	Disagree
	Poor (5)	Str. Disagree
Developing and Evaluating Competency N=41	Excellent (1) 5 12.2%	Strong Agree 3 7.3%
	(2) 13 31.7%	Agree 13 31.7%
	(3) 7 17.1%	Doubtful 10 24.4%
	(4) 9 21.9%	Disagree 11 26.8%
	Poor (5) 7 17.5%	Str. Disagree 4 9.8%
Developing a Plan for Student Learning N=16	Excellent (1) 2 12.5%	Strong Agree 1 6.3%
	(2) 5 31.4%	Agree 6 37.5%
	(3) 6 37.4%	Doubtful 3 18.7%
	(4) 3 18.7%	Disagree 6 37.5 %
	Poor (5)	Str. Disagree

What feedback could we give the presenter(s) of the Wednesday consultant-lead session to improve your experience in the future?

I heard someone say... Now What? Digging Deeper into Classroom Discussions

- Good session but I would of liked more time and practice spent with the consultants from the Lester B Pearson colleagues.
- More time for Round table discussion
- The room was too noisy for the small group led activity and it would have been less intimidating to have 2 teachers co-teach the lesson, rather than one teacher having to lead the group.
- I loved the presentation, I thought the ladies did an excellent job. I even came home and ordered the book they recommended
- Having a set of math talks already planned for us and ready to use would be a nice addition.
- I don't think improvements have anything to do with how the presenter led the session but rather there is so much to learn!
- Materials have to be on hand; either provide photocopies (ideally) or make sure anything posted or projected is large enough to see properly.
- Focus on more examples that can be used in the classroom, like the dot card activity, a little less general (2)
- More examples of the types of questioning needed before actually asking us to do the questioning (teacher-student) activity.
- They provided good questions but did not provide sample answers enough.
- I really enjoyed this session and would like to hear additional information on developing class discussions.
- Please share/allow access to the presentation slides.
- I love their idea of the gallery walk and so they should encourage teachers to use them in the classroom.
- Maybe give this session at another time? I was tired and not always a good listener. A lot to process...

Developing and Evaluating Competency

- They did not offer any strategies to help students with solving the situational problems that they are required to answer on end of year exams.
- There seems to be a disconnect of situational problems from board to board. The presenters said that discussion was allowed during situational problems, but that is not the case in my Board. I asked a question regarding this fact and how it applies to end of year exams. They said they would answer the question at the end of the session, which they never did. I also found that if you weren't from one of the boards presenting, they way your board handles situational problems did not matter.
- We were not given any handouts/resources that we could use in our classroom. We were told they would be emailed to us but we still have not received them. We were too many people in this session and it was very hard to see the slides at times due to this
- Less reading over the QEP and POL. More time devoted to how to administer, break apart, etc... situational problems. One of the presenters was enthusiastic, shared great ideas, and I learned the most from him. He should have lead the entire session by himself.
- We did not receive the TALK to LEARN rubric.

- Even more examples and work through.
- Give access to the resources presented to us
- Before the break , they dealt with matters that we all thought were very pertinent; after the break, we were told we'd be working on evaluating sit. Probs. however we thought they'd show us ways to evaluate but we were simply shown rubrics that had been created and tested and we weren't given access to them
- The presentation was very irrelevant. Many participants thought that we were going to learn about situational problems and how to create them. The presenters basically handed us a photocopy of the QEP and read through it. Unfortunately, many of us were very tempted to leave the workshop.
- more strategies
- Do not read power point documents to the attendees. Use TQE - assign tasks for discussion
- The content was excellent. I just felt like the speakers were each sharing their part, but it didn't unified..
- How to tie in the expectations of the ministry and board exams with the philosophy of the TQE.
- It should have been done by cycle level - it was too advanced for my use
- Please be better prepared, better synchronized between presenters and more engaging.
- The consultant-lead session was not in line with what we had experience the previous two days with Lisa. I did not need to be told what a situational problem is according to the curriculum. What I expected was strategies to help me create these problems in my class. The presenters were reading their notes and not sharing new information. I was very disappointed with the last day. Not the same as year 1.
- Not use the exact same content that our own schoolboard used during our workshops. Not be so broad and generalized because it's not a one-size-fits-all type thing.
- It was too theoretical and not enough hands-on activities or ideas.

Developing a Plan for Student Learning

- I wasn't engaged in this session. The information didn't feel new to me. It was more a refresher. (4)
- the session was a bit large leading to less interaction than ideal
- The group was too big. More descriptions should have been given as the subject matter did not relate to my grade level.
- Better planning! There was not enough time for the essential wrap up
- It didn't feel valid. I felt like they were teaching me how to use my plan book.
- The presentation and slide show were more useful than the group work.
- I didn't find it was really about planning, I found that it was a recap of our presentations before. I wanted more about long-term planning.
- I was looking for more guidance on curriculum mapping. We understand the idea of conceptual teaching, but now we need time to place the Progression of Learning into a manageable frame.
- Refine the content and aim for deeper understanding
- It went too fast

What support mechanisms do you feel your school board could provide to help you continue to grow professionally after this PD experience?

- More opportunities to work collaboratively to create new tasks (9)
- Feedback on if I am using the techniques properly
- Meeting after the Institute (19)
- Release time for follow up sessions - organized by cycle (12)
- Frequent visits with fellow participants, including classroom visits, working with manipulatives within our specific curriculum/learning needs
- Manipulatives, (money to purchase) bank of math talk questions (19)
- More time and resources to practice the concepts learnt. (2)
- I would love to have time to prepare a bank of open ended questions. Also time to discuss how things are going in the math classrooms.
- to have video conference once a year with the speakers to keep up with new ways of using manipulatives
- Support content in French
- Help rewriting lessons and tests
- Provide days of substitution: Time to prep activities, meet with other members who attended the academy, visit other classrooms in the school to team teach/try things out and get other teachers in the school on board (share our experience) (3)
- Please drop by our school ... support from Consultants (17)
- Sessions on ped days,
- I would like to have another member of the high school attend the institute so that we can share teaching practices.
- Sessions in school with actual department members. A website with video support or webinars. A discussion forum.
- more training through the year to keep us in touch with what we learned
- release time to bring our knowledge to the younger grades that have not been trained in TQE
- More teachers to attend institute
- It would be nice if the consultant would come into our school and support us in implementing this new approach. We leave the Academy with motivation and enthusiasm but sometimes struggle with using all of the information learned in our classroom. Also, othe staff members need to get on board with this approach and our consultant could assist us in training others.
- Support developing goal oriented lessons
- To give us the time to create "TQE" lessons and perhaps sharing with other school boards that did attend the Cohort prior to us. It would be wonderful to have a bank of tasks planned by all of the school boards and to share.
- Workshops at school (help get others on board) (3)
- We work closely with our consultants, so I believe my board is doing a great job.
- I think it is important for us to have the opportunity to share what we are doing with our colleagues. (This can be through technology.) I think it is important that knowledge be shared between boards and for our consultant to continue to be involved in the process.
- Time to plan (4)
- More resources, especially about the questioning aspect.

- This should be offered to all math teachers in order to have consistency
- I would like to have whiteboards (on the walls and small individual ones) for students to show work when working on task where they come up with their own ways to solve math problems. Also, time to plan with colleagues and upgrade our formative-summative evaluations.
- A bank of essential questions and perhaps some centre plans.
- PD more relevant to my grade level.
- I would like the school board to continue in this vein. More examples of how to apply these lessons and when. Dissecting how to do the TQE process and run math talks. I'd like to learn more about the theory and just as much in the practice with things such as adding, subtracting, multiplying dividing etc.
- Tough question: I find it hard to share the content with my colleagues who did not attend the Institute at school as it is not a cookie cutter approach. There is never enough time in the day either. The board could find a way to expand the approach without relying solely on its Math Summer Institute ambassadors' good will.
- On-line training
- I would like to see teacher in action!

From the list of teaching practices below, which three would be your top priority for professional development?

Teaching Practice	Indicated as first choice	Indicated as second choice	Indicated as third choice
Representing student thinking and key ideas	29	-	-
Orienting students to each other's ideas	24	7	-
Recognizing students as competent contributors towards developing understanding	11	8	1
Eliciting and responding to student thinking	16	20	1
Designing and facilitating rich math activities that allow for student sense-making	5	46	25
Establishing and maintaining expectations for student participation	-	5	16
Identifying and teaching towards an instructional goal	-	2	35

*Not all responses included three options

What content should be the focus of future PD (i.e. what content area or curricular goal(s) do you feel least prepared to teach conceptually?

- Geometry (10)
- Fractions and decimals (7)
- Number sense (7)
- Measurement (5)
- Metric conversion
- Clock reading – telling time (3)
- Situational problems (10)
- Building tasks connected to making student thinking visible
- Basic skills the students do not know at the elementary level
- Division (8)
- Long multiplication
- Word problems (8)
- Student engagement/participation (3)
- Questioning techniques
- Probability (4)
- Skip counting
- Managing whole class while using different strategies
- Any lesson is valuable
- Best practices to successfully implement this way of teaching. Planning and organizing a year around big ideas.
- Rule for a series
- Designing Math rich activities (6)
- Algebra (3)
- Manipulative in Secondary
- Trigonometry
- Arithmetic - it is so easy to go straight to the algorithms

- Supporting classrooms that are not using math books. Building evaluations that correspond to each essential learning task in the Progression of Learning.
- Place value for Cycle (4)
- More hands-on ideas
- Curricular mapping
- Identifying and teaching towards an instructional goal
- Multiplying and dividing fractions
- Statistics
- Ways to promote thinking outside the box
- I would like to help kids with decoding a word problem. Lots of kids struggle with that.

Is there any other feedback or recommendations that you wish to provide the organizing committee?

- Everything is well-planned and very engaging. It's one of my favorite conferences. I already see changes in the way I teach Math.
- Less meals – we do not need all that food
- Thank you for the great PD experience in math, I have learned a lot.
- I found the consultant lead workshop to be a waste of time.
- Thank you! (7)
- I love, love, love math camp!!!! I am truly grateful for the opportunity to participate. This experience has changed the way I teach, and not just in math.
- Very well organized! Keep up the good work. I look forward to next year!
- We're too tired on the last day for a break out session. I think the last day should end earlier. I would prefer even talking math between 3-5 pm and cut on time on the last day.
- The cohort should last more than 3 years
- Year two should have more of a "wow" factor or video analysis
- The first year, I felt a huge shift in my way of seeing how math should be taught. This year, it felt like we were just continuing what we had done the precedent year instead of going a step further (there was no "wow factor"). Now that the shift is made in our way of seeing math conceptually, I would really like to come out of this experience with a bank of tasks, activities and talks ready to use in my class.
- It is a great experience! Can't wait to go back next year!
- The second year is a bit repetitive. Give more options.

- Thank you for this opportunity to be involved in this new way of teaching math! It is greatly appreciated! I do wish for this project to become the new way across our school board.
- There is so much content that we must cover! I know boards are working on creating documents concerning what concepts are most important, however, I think we should be sharing this rather than each board doing their own.
- The binder and book are very helpful to refer to in the classroom
- I would like more flexibility when it comes to scheduling meals for my spouse. The hotel wanted to know 6 months in advance when my wife would be joining me for meals. I find this a little ridiculous.
- Overall, I really enjoyed the sessions. They got me ready to start the school year. I much preferred the sessions with the DNA team, as the consultant-led session was too similar to PD sessions I participated in at my school board. I also missed the closing session. Last year, the closing session was a great way to end our "retreat". It was a way to look towards the upcoming school year feeling positive and inspired.
- I really appreciate their methods of teaching and sense of humor too.
- Fantastic workshop. Please make a group for secondary teachers:)
- It would be nice to have presenters become aware of the type of teaching environment that Quebec Teachers have (2 classes) to teach the curriculum in rather than American teachers who have the same class every day.
- more communication with hotel, when something wasn't ok, hotel staff would say talk to coordinator and then coordinator said talk to hotel rep.
- I would like to see some extra time in the schedule to interact on a more informal basis with the presenters and other participants. It would still be a mathematical conversation, but not in a class-like setting.
- Great initiative
- Continue your great work and thank you for bringing educators together to help us improve the teaching and learning of mathematics.
- I think that those who organized this event did an amazing job.
- re-evaluate the consultant -lead sessions; this institute has changed me as an educator. I so much enjoy teaching math and have face my fears of teaching fractions, measurement and shapes. I have taken my teaching to a whole new level and look forward to sharing all the richness of the activities with my students. Thank you for the amazing opportunity in allowing me to be part of this professionally like changing experience.
- Next year I was they will go over the content area of Measurement again.
- I think we should ALL get the books that go with this math institute. I will have the school buy them for me and my colleagues. But I think we should have them anyway. And I wish we could have access to videos presented during our sessions so we can reproduce the activities. I hope by buying the books I will have access to all of them. if not, a fast link to those videos would be appreciated so we don't spend time searching for them on the web.
- Overall, great convention!

Appendix C

Summary of the Feedback from Cohort Three – Math Summer Institute 2017

Number of respondents: n= 99 (78.0%)

	Excellent (1)	(2)	(3)	(4)	Poor (5)	Comment
Experience booking accommodations	72 72.7%	20 20.2%	6 6.1%	1 1.0%		<p>I had to contact the hotel several times in order to receive confirmation of my room booking.</p> <p>The cancellation policy was inflexible especially given the business the hotel received from our group.</p> <p>Long waiting times to check in and rooms were not available at the check in time as specified. In addition, we were misled with the fact that kids under 5 eat for free...confusion different responses regarding this.</p> <p>The room was beautiful. The service could have been better. We were not given new towels and did not receive the cot that we requested until 11:00 at night after a phone call to remind them.</p>
How would you rate accommodations	77 77.8%	18 18.2%	3 3.0%	1 1.0%		<p>The room smelled strongly of cigarettes and was then sprayed with a very strong smelling room freshener which did not help. The room was a bit outdated.</p>

How would you rate the meals	67 67.7%	23 23.2%	6 6.1%	2 2.0%	1 1.0%	
						<p>In the dining room, often times there was no cutlery or napkins. As well, we often had to wait or ask for coffee and juice in the morning.</p> <p>There weren't many vegetarian options. Furthermore, a few attendees and myself had difficulty digesting the food and felt ill.</p> <p>The food, especially breakfast, was a bit repetitive and the overall quality was less than I had had at other LCEEQ events. But overall it was still good.</p> <p>There was too many saucy meals. I also had indicated my specific allergy when I registered and they served a dish with the allergen in it. I wasn't well for half of that day. Although I indicated in the registration phase that I cannot consume dairy products, I found it very difficult to navigate the buffet as there were often not many options available to me. In all 4 days there was not one dairy-free dessert option apart from fruit. I found it insulting.</p> <p>Everything was very well organized and the food was fantastic!</p>

Note: Participants who rated a 3 or greater were asked to comment

	Excellent (1)	(2)	(3)	(4)	Poor (5)	Comment
How would you rate the breakout session room	55 55.6%	31 31.3%	10 10.1%	3 3.0%		<p>The divider in the room was not sound proof enough and at times it was difficult to hear the speaker because of the noise coming from next door. (5)</p> <p>Being in a break out room with more natural light would be great!</p> <p>The breakout room was very hot and then very cold. (3)</p> <p>The break out rooms were freezing cold</p>

	Strongly Agree	Agree	Doubtful	Disagree	Strongly Disagree	Comment
I received all the information required regarding the Math Summer Institute	60 60.6%	36 36.4%	3 3.0%			
I received the information regarding the Math Summer Institute in a timely manner	62 62.6%	32 32.3%	5 5.1%			
The goal of this PD experience was clear to me prior to my arrival	50 50.5%	43 43.4%	6 6.1%			
Mathematics is something I'm good at		99 100%				

Briefly describe how you learned of this event and why you chose to participate.

- ✓ Math consultant (24)
- ✓ Principal (13)
- ✓ Colleague who had attended (32)
- ✓ Board flyer (9)
- ✓ Friend (2)
- ✓ Became a Consultant
- ✓ LCEEQ Website
- ✓ Curriculum Head recommendation (5)
- ✓ No response (12)

If you were to observe another teacher's math classroom for one or more lessons, what are three (3) things you would look for in order to decide whether or not the instruction is of high-quality?

Response ranked by frequency:

- ✓ Student engagement (42)
- ✓ Rich questioning (23)
- ✓ Use of manipulatives (46)
- ✓ Math talk (4)
- ✓ Showing/Using multiple strategies to solve a problem (7)
- ✓ Students talk more than teacher (14)
- ✓ Students discuss/explore concepts (4)
- ✓ Clarity of explanation (13)
- ✓ Clear learning objectives
- ✓ Students justify their answers (2)
- ✓ Time for exploration (6)
- ✓ Teacher intervention (3)
- ✓ Student directed lesson(s)
- ✓ Verifying understanding (13)
- ✓ Math centers
- ✓ Evaluation (2)
- ✓ Group work (9)
- ✓ Quality of lesson (10)
- ✓ Teacher/Student relationships (4)
- ✓ Organization of lesson (3)
- ✓ Teacher knowledge/comfort (4)
- ✓ Hands-on activities (3)
- ✓ Teacher feedback (2)
- ✓ Task variety (2)
- ✓ Differentiation (7)
- ✓ Context/Concept
- ✓ Types of problems
- ✓ High cognitive demand
- ✓ Not the teacher who does all the Math
- ✓ Not just one right answer

Please indicate how often you invite student-invented strategies prior to teaching an algorithm or procedure:

All the time	2	2.0%
Often	23	23.3
Sometimes	58	58.6
Rarely	13	13.1
Not at all	3	3.0

In your current context, for every ten (10) lessons you teach, on average, in how many lessons are the students using manipulatives

Zero times	7	7.1%
1-2 times	17	17.2%
3-5 times	31	31.3
6-7 times	26	26.2
8-10 times	18	18.2

Briefly list and describe some factors that influence how often manipulatives are used in your lessons

- ✓ Time (36)
- ✓ Availability (43)
- ✓ Topic/content (25)
- ✓ Knowledge of how to use them (35)
- ✓ Students always encouraged to use (9)
- ✓ Visible and part of classroom culture
- ✓ Some students are visible learners (3)
- ✓ Student behaviour (3)
- ✓ Use with struggling students (3)
- ✓ Students ability to organize the materials
- ✓ Use them if it is a review lesson

	Strongly Agree	Agree	Doubtful	Disagree	Strongly Disagree	Comment
The content of the workshops at the Summer Institute was representative of my needs as a Mathematics teacher	54 54.5%	45 45.5%				
The amount of content in the breakout sessions was appropriate	50 50.5%	47 47.5%	2 2.0%			
The pacing of the breakout sessions was appropriate	42 42.4%	50 50.5%	7 7.1%			

If you disagreed with any of the statements, please indicate why:

- I felt the conference was one day too long.
- There was a lot of chatter in my session. I would prefer to learn and try new strategies rather than debate.
- I would say, we could have used more time! (2)
- I think that they might be trying to cover too much in such a short intense period of time. We didn't finish all the material in the binder and I felt like on the last day we were rushing to get as much done as possible.
- I would have liked more content and a little less time given to the little groups solving math problems. While it was definitely fun I believe the time could have been spent more wisely.
- I just wish we could have covered all of the content. I loved the learning.
- Too slow at first then we rushed through to the end.
- I was somewhat disappointed that we didn't get to explore all the content in our slides. I felt that too much time was given to people who went off topic. While I understand that it is important to listen to all and to seem open to questioning, I felt that certain questions brought up were better suited to be shared among teacher groups with their consultants. When a teacher asks about what the high school teachers feel is lacking mathematically from the entering elementary students and we have a 20 minute discussion regarding this, it takes away from the scope of the conference. Also, I felt that certain teachers in my grouping were often challenging our wonderful presenter (asking "Will my boys do this?"), again wasting time. I, as well as certain others at my table were growing increasingly frustrated that we unfortunately went on these tangents.
- I found that the pacing on the last day was too speedy. I realize that there was a lot of material to cover, however, I felt as though we were rushing through the last day to make up for missed time during the first two days.

How would you rate the presenter's facilitation of your breakout session?

Presenter	Number of respondents	Excellent (1)	(2)	(3)	(4)	Poor (5)
Thomasenia Adams	18	38.9%	55.6%	5.5%		
Juli Dixon	26	96.2%	3.8%			
Ed Nolan	17	52.9%	35.3%		5.9%	5.9%
George Roy	21	71.4%	28.6%			
Farshid Safi	17	76.5%	23.5%			
Total	99					

What feedback could we give the presenter in your breakout room to improve your experience in the future?

Thomasenia Adams:

- It was nice when she shared personal anecdotes. (2)
- Activities in the beginning to get participants to mingle and set the tone of working together, getting to know each other and not judging.
- She needed to keep the negativity in the breakout sessions down, many teachers were focusing on 'difficulties' that might make teaching in a certain way, challenging. Some teachers were very distracted and distracting.
- Our presenter really did a fabulous job. I feel like I took a lot away from the experience. The suggestion that I would offer is that at times it felt that there was too much down time. We were given an activity to complete with too much time to do so. I wish that it could have been sped up to cover more content instead.
- More interactive less lecture
- It was just a little dry.
- Other strategies to use with students who are non verbal and can't answer questions. Ways to present information visually for my visual learners as many of them are not auditory learners and they do not respond to questions.
- To not change a thing. She was professional, curious, and supportive. She asked challenging questions and stretched our thinking. She is everything I wish my own math teachers had been throughout my elementary/secondary years.

Juli Dixon:

- Not her fault, but we needed more time to get through all the material. (2)
- Pacing was an issue but I hope that fractions continue to be a part of the next session.

- Hoping to get the same presenter next year.
- None! She was fantastic! (4)
- Being more in the middle of the room for presenting and walking around.
- I was very impressed with Juli's presentation, her knowledge and feedback to questions. She is a master teacher!!!
- Limit the amount of time for repetitive questions.
- Strategies to encourage the varying math knowledge/understanding levels in the classroom and strategies to encourage math alignment among teachers so that every year is not a new math year.
- Love your passion and energy
- Honestly, it was excellent. I wished there was more time so we could discuss what was specific to our needs, school's needs, etc. Certain topics I wished we had more time vs. others but I know that this is difficult when trying to meet everybody's needs!

Ed Nolan:

- Less chatting and more of the awesome stuff you have to share (2)
- We didn't quite cover all material, maybe adjust some.
- He paced the material well at the beginning and then when we got into fractions and decimals it went a little too quickly for me. I know there was a lot of material to cover in a short period of time, but a little slower would be great. Keep up the good work
- I really appreciated how Ed handled some of the more skeptical members of his audience. The only thing I can really say is perhaps pay a bit more attention to individual's names as, despite name cards, he frequently called the same people by the wrong name.
- I think Ed had it all covered - there was not a question or topic he could not handle and handled delicate issues well also. It would be nice to do a once around to hear participant's names and what school or school board they came from. Continue doing what he is doing.
- You were very kind and patient, often wanting to make sure that you were meeting the needs of the teachers in the room. I would encourage you to feel comfortable redirecting questions that can be discussed in teachers' schools or centers. It was frustrating to see the pages of slides that we couldn't get through. You were extremely pleasant and dynamic however.
- More of the same, great!

George Roy:

- I felt we were a bit rushed at the end because so much time was taken in the beginning; however, I understand he was creating a learning environment.
- Perhaps having participants introduce themselves earlier, otherwise, very fun to work with, I learned a lot! (2)
- I would have liked more ready-to-use lessons (2)
- While I really enjoyed the session and his animation I believe less time should be given to actually finding the solutions to the problems we are given to solve (even though we enjoyed working on them) so that we could have had more information to bring

back with us. I'm talking more about the 'fun' type problem solving like the magic square, not the useful ones such as analyzing the different types of problems.

- George did an excellent of pacing our sessions and demonstrating the classroom atmosphere we should be providing our students.
- Sometimes pacing was slow
- I really enjoyed learning from George J. Roy. He has a wonderful personality that captivates his listeners, and he is "Canadian" funny. There was a lot of material available to cover, however, we did not cover all of it as we found ourselves in valuable discussion but that meant some material was overlooked. I enjoyed the discussions, but I also would have liked to have progressed further through the handouts.
- Some questions lead to lengthy tangents and we missed some content. All very interesting but I'd like to stay more on track with the program n maybe save time at the end of each day to address any off topic questions that arise
- I thought he was excellent: he knew his subject very well, paid attention to the needs of his teacher clientele. (2)

Farshid Safi:

- Honestly, he was awesome!
- I loved his style....the way he modelled for us the type of teaching he was hoping to inspire in us.
- I think he did an excellent job, not sure if he needs improvement.
- Farshid was an excellent presenter. I found him very engaging. I can't think of any feedback to help him improve.
- He was fabulous! Keep doing what you are doing -I learned so much and had fun doing it!
- On day 1 I had questions which I repeated asked and did not get answered. I understand that the presenter was modelling a student-centered teaching approach but at some point coming out and answering a question can be appropriate as well. This improved as the days went on.
- Great presenter! He grabbed and maintained everyone's attention, gave relevant examples and gave all of us a chance to contribute to discussions.
- I want to come back next year with the presenter

What support mechanisms do you feel your school board could provide to help you continue to grow professionally after this PD experience?

- Online professional group to share ongoing development of skill (2)
- Time to meet with other teachers in my Cohort (12)
- Help with planning
- Support from the Consultant (3)
- Check ins with math department to ensure that we continue to teach math in a continual/progressive manner
- Visit classroom – watch each other teach (3)
- Workshops by level to share and prepare materials (2)
- This summer workshop should be mandatory for all Math teachers. If it is only done by a few and not necessarily at the same school, there is no progression. What the student learns this year (and is successful with) might not be accepted by the teacher in the following years.
- Access to manipulatives/resources (6)
- Follow up on how we are doing even after the Institute sessions are over two years from now.
- Support with implementation and where to begin.
- Continue to make Math PD workshops like this an annual experience allowing teachers to volunteer to participate not forced to participate. Making sure the schools allow the teachers who participate in the math workshops to use and practice their knowledge in the classroom and not to have to conform to the model that other teachers are doing in the schools who have not and are not planning to participate in the workshops. (teaching only to the book and units)
- Importance of having a 1 or 2 day mid year workshop to reinforce math methods (6)
- Release days in school for conference teachers to get together to plan their math year with the workshops methodology in mind and share resources and ideas. (8)
- PLC meetings with other Math teachers
- More math seminars that follow up with the information given rather than just focusing on the End of Cycle Exams.
- Use of manipulatives at the high school level
- We didn't have a chance to explore decimals, a concept in which Cycle 3 students struggle with greatly. I would appreciate being exposed to different methods of explaining this concept. Furthermore, I would appreciate gaining insight on how to apply differentiated practices when it comes to solving a situational problem.

- We are planning a session with another board so teachers can collaborate and meetings online so teachers can share their experiences.
- On-going PD for consultants in order to better support our teachers.
- Help to develop a more hand-on program (2)
- School-wide training and continued PD that is in line with the same philosophy, providing more PD on how to facilitate meaningful math discussion in class (4)
- Provide reference books that match the Math institute's teaching. It's inappropriate for teachers to have to find and purchase their own materials.
- Splitting the grades 1-2 class for math

From the list of teaching practices below, which three would be your top priority for professional development?

Teaching Practice	Indicated as first choice	Indicated as second choice	Indicated as third choice
Representing student thinking and key ideas	35	-	-
Orienting students to each other's ideas	13	7	-
Recognizing students as competent contributors towards developing understanding	22	6	1
Eliciting and responding to student thinking	23	27	1
Designing and facilitating rich math activities that allow for student sense-making	8	50	29
Establishing and maintaining expectations for student participation	-	4	20
Identifying and teaching towards an instructional goal	-	2	36
Other:			
Formative assessment	-	-	1
Developing math activities for all levels of learners including those who are visual learners			1
Engaging students in extended, higher order thinking challenges			1

***Not all respondents offered three options**

What content should be the focus of future PD (i.e. what content area or curricular goal(s) do you feel least prepared to teach conceptually?

- Situational problems (13)
- Geometry (2)
- designing and facilitating rich math activities
- Fractions (12)
- Place value (2)
- Exponents with manipulatives
- Time and measurement (4)
- Money
- Planning
- Evaluating (2)
- Decimals (11)
- Long division (4)
- Algebra (7)
- Number sense (6)
- Order of operations
- Gap between strong and weak students
- Probability
- Regrouping (2)
- Questioning (2)
- Graphing (2)
- Higher order thinking
- Logarithms
- Hands-on activities (2)
- Complex tasks
- Percentage and ratio
- Multiplication (2)
- Subtraction (2)
- Use of manipulatives (2)
- Math talk tasks (2)

- Classroom organization
- Working with student with learning difficulties
- Kindergarten Math expectations
- Introducing new topics

- Language Arts – reading in particular

Is there any other feedback or recommendations that you wish to provide the organizing committee?

- I had a great time and learned a ton! Can't wait until next summer! (5)
- I found the workshop and hotel accommodations excellent however, hotel staff were not always friendly or quick to serve.
- It was very well organized (5)
- The workshops are incredible for learning and for feeling safe to ask questions.
Guidance on what manipulatives work best for what concepts.
Love the giveaways at the end of the workshop - wasn't lucky, maybe next time.
Logistics - Shorter lunch or sandwich lunch option , double coffee station during breaks
- I am so very happy that I was able to attend. My colleague and I are doing our best to improve our teaching in math based on our new learning. Get more teachers involved if you can!
- The entire scope of the conference is exceptional. It was so hard to adjourn for the day, as I was excited to hear more! Again, my only disappointment was that we couldn't have covered all of the material. The accommodations and service was exceptional.
- It would be nice to have an informal evening get together to encourage the sharing of ideas in a casual setting. This would allow teachers, specialists and animators to learn from each other.
- A bit more variety of food if possible-otherwise it was great!
- Fabulous job! Thank you so much!
- Sharing opportunity among participants to discuss methods used in class and sharing emails
- This is a wonderful workshop. I enjoyed that it was before school started, it was like a kickoff for the year. It got my fire burning and I wanted to get back into the classroom and start teaching again. I feel that this training should be available to all teachers and should be a continuing workshop so that all teachers and administrators are on the same page when it comes to teaching math. As more teachers undergo the training, the students will become more confident in math discussions, applying different strategies, and thinking and learning as a whole.

- Maybe a bit more hands on practice, we sat for hours sometimes
- I am pleased with the Math Summer Institute. I came back with new ideas to teach Math in Kindergarten.
- More time to work with other teachers to put together how you will implement the information.
- This was a practice changing experience, it gives such a clear understanding on how to best support the whole range of students we experience in class. It has put into focus what we should be teaching and where/how to start. Everyone teaching math should have this experience. Additionally, This should really be incorporated into the teachers curriculum in University, many of our new teachers coming into the workforce are poorly prepared to teach math effectively. They rely on how they were taught, which is in many cases outdated and not focusing on student understanding.
- Thank you. This was the best PD that I have received in a long time!
- This was an amazing Institute. I really had to rethink the way I understood math as well as the way I teach the students. I was very good at Math so it helped me to understand how and why other students struggle with Math.
- Thank you for undertaking the job of organizing this math institute and bringing together teachers from across the province, accommodating our different needs, being flexible, and available to answer questions.
- Have a session for the principals there and have them work out how they can best support us and exchange strategies
- I found the time allotted for lunch to be long. I would have preferred a shorter day as my brain was quite fried by 3pm.
- All the PD in the world is not going to help if the students are given standardized tests (year end exams) that do not take language levels or cognitive development into account. Yes, we can scaffold them into abstract thinking in the classroom, but these exams prohibit the use of models and/manipulatives for certain questions. We need exams that are aligned to our teaching, and our students' culture and cognitive development.
- Thank you so much to the organizing committee for making this summer institute possible. I am very fortunate to be a part of it. Thank you for investing in us so that we can be better teachers for our students. This opportunity was a very rich and valuable one. Thank you. (2)
- I feel privileged to be a part of Cohort 3. It was by far the best PD experience I have ever had.