



Geri Lorway
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Math Implementation Report: **2011-2012**

Successes, Challenges, Lessons Learned in the Field

Summary Page NRLC Math Implementation Report: 2011-2012

Successes, Challenges, Lessons Learned in the Field

The following pages offer evidence to support these Key Successes and the Challenges that accompany them:

Need Identified	Success	Challenge	Action
Support for Senior High Implementation	Senior High Coach/Facilitator Senior High Institute Rubric Writing Workshops Evidence: Page 2	Time, Sparsely, Density: too few teachers, too far away. NRLC Senior High Lead was seconded away. Response to June Survey indicates use PD days for support. Focus on collaboration and assessment.	The response to June survey makes clear time is precious. (Survey attached as appendix) Contract Senior High Lead to continue Assessment Project, schedule PD Days where possible.
Build Teacher Leadership Capacity	Elementary and Junior High Cohorts Members of the Cohorts have assumed leadership roles throughout their Districts and beyond. Evidence: Pages 2 to 4 Video: Teacher Leadership www.youtube.com/watch?v=8jQaicvzt2I Video: A Teacher Shares Her Classroom: Grade 9 www.youtube.com/watch?v=c20s9qO_uGo	Conflicting priorities, as teachers are recognized as leaders demands on their time restrict their ability to participate in math. Availability of venues within Districts for teachers to lead.	Create opportunities for teacher leaders to network and lead: June 10,11 Showcase, PD Days, Workshops, McATA, Conventions Explore Elluminate and Summer Programs
Build Teacher Instructional Capacity Unrelenting focus on Curriculum and Instruction. Conceptual Understanding Process Skills, Relational Thinking	Evidence of process skills and 21st century competencies is evident in teacher samples Evidence: Pages 2 to 4 Video One:Teacher Planning Successes www.youtube.com/watch?v=uUMw5agMCvY	Make connections to reduce feelings of overload. Showcase and warehouse vivid examples of approaches that draw connections between: Mathematics Curriculum 21st Century Competencies, Inclusive Education, Differentiation, Assessment for Learning	Continue to keep unrelenting focus on curriculum: Speakers, facilitators, all presentations have common core: Revised Curriculums, 2007 Framework for Student Learning
Evidence of Impact on Student Achievement	Evidence offered from SON School on Grade 6 PAT results. Evidence: Page 4 Observational Data offered by teachers Voices of Students at Work Video	Student Achievement data falls with in the school and school District domain. Factors that affect achievement are complex and highly inter-related. PD is that impacts teacher performance and belief is one factor.	Teachers and schools within the umbrella of the cohorts are engaging in building rubrics to monitor and evaluate student engagement, perseverance, process skills. NRLC is collaborating with partners to generate and gather <u>evidence of achievement through student voice.</u>

Appendix Attached: June Survey to Identify Needs of Senior High Math Teachers for Implementation Support: 2012-2013

NRLC Math Implementation 2011-2012

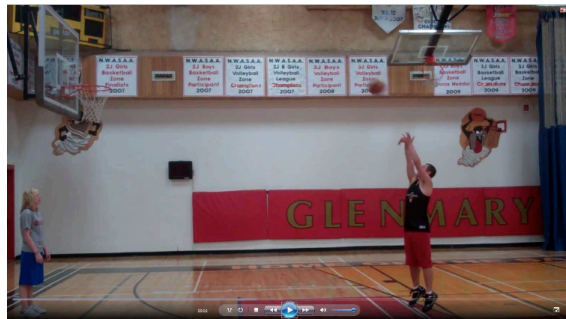
SUCCESSES
CHALLENGES
LESSONS LEARNED
IN THE FIELD

SUCCESS: Spencer Pinnock, was seconded to provide support as a Math Lead for Senior High 0.25. Below are samples of some of the materials Spencer developed and shared with colleagues.

*Worked with my students to create a rubric for the curve sketching unit in math 31. We used this to mark each other's work during the learning stages. We then used to mark the end of unit **GROUP TEST**. Students agreed it was a fair process. They found it placed the focus on process and understanding. They liked that a partner could help them find "stupid" mistakes.*

This experience led me to think that if we had criteria set out ahead of time for all our outcomes, then students could be active partners in assessment. We might not even need exams?

Spencer built visual prompts to demonstrate techniques for engaging Senior High students....



This photo features students participating in a real world context. The teacher goal is to lift the mathematics off the textbook page and into everyday, familiar experiences. In this situation, students were challenged to apply mathematical understandings to prove the ball will or will not make the hoop.

CHALLENGE: The 0.25 time had to be scheduled as a daily commitment. This arrangement greatly reduced the flexibility and efficacy of the Lead Teacher.

LESSON LEARNED: A 0.25 position did not provide enough time for one person, in one year, to focus on both building networks between teachers in the field and building resources.

Spencer completed an Assessment project that received high praise from teachers in the field:

Building Outcomes Based Rubrics to Assess Student Achievement: During this 2 day workshop, teachers collaborated to create rubrics that describe specifically what a student must be able to do in order to demonstrate proficiency or excellence with each outcome for 10C. They are written so that a student can read the rubric, view his or her work, explain the mark to a parent and describe what they need to do in order to improve that mark. Summative Assessment questions accompany each outcome.

A Sample from the Rubrics created specific to 10-C

Outcome 6: Relate linear relations to their graphs expressed in:
slope-intercept form ($y = mx + b$) slope-point form ($y - y_1 = m(x - x_1)$)
general form ($Ax + By + C = 0$)

Proficiency	Criteria
4	Graph a linear relation in all three forms (with minor errors), and explain more than one strategy used to create the graph Able to rewrite a linear relation in either slope-intercept or general form
3	Graph a linear relation in all three forms (with minor errors), and explain the strategy used to create the graph Able to rewrite a linear relation in either slope-intercept or general form
2	Graph a linear relation in all three forms (with minor errors) Able to rewrite a linear relation in either slope-intercept or general form
1	Cannot graph a linear relation in all three forms or explain strategies used to create the graph Unable to rewrite a linear relation in either slope-intercept or general form

This was the most useful PD I have ever engaged in. It really forced me to look hard and long at my expectations in the course and I realized they have not been high enough... I have to be far more careful how I choose assignments and what I expect students to demonstrate. We had some deep discussions around how robust our current assessments are, and lots of talk about what it takes to get 50% now that we really look at the curriculum.

I had the "aha" part way through the day. I see why students are struggling in Grade 12...I am not teaching with rigor in Grade 10. I need to aim all students for excellence. This is tough to admit but wow did it open my eyes.... I need to teach for students to demonstrate understanding, not just churn out answers. Jr/Sr High Teacher, PWSB

Summative Assessment Items Aligned to Rubric: Question 1

Match each linear relation to its graph.

Equation 1:
 $2x - y + 5 = 0$

Equation 2:
 $y = -2x + 1$

Equation 3:
 $y = 1 - x$

Equation 4:
 $2y - x = 6$

CHALLENGE: Teachers have requested that Spencer repeat this workshop for 20-1, 20-2, 30-1, 30-2 courses. NRLC is willing to set those sessions up, will teachers come? In responding to the question of when are you most likely to participate in pd events, more than 3/4 of the respondents indicated District PD days and Teacher Convention. Unfortunately these are not held on days common across all NRLC jurisdictions.

LESSONS LEARNED: From our experiences to date with Senior High teachers, they are most likely to choose to participate in professional development opportunities based on the positive testimonials of colleagues and when they receive regular, personally addressed updates and reminders on dates and times.

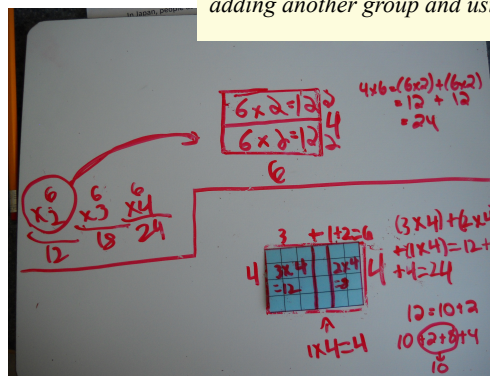
SUCCESS Planning for Instruction and Assessment is Changing

Effective professional development experiences support teacher leadership. Teachers become supporters of other teachers, agents of change and promoters of reform. (Mundry, 2005).

NRLC Strategies and Initiatives for nurturing and sustaining teacher leadership capacity include continued support for Elementary and Junior High Leadership Cohorts. No less than 10 teachers from these cohorts assumed formal leadership positions within their Districts for 2012-2013. Attached are samples of the work the Cohorts are engaged in.

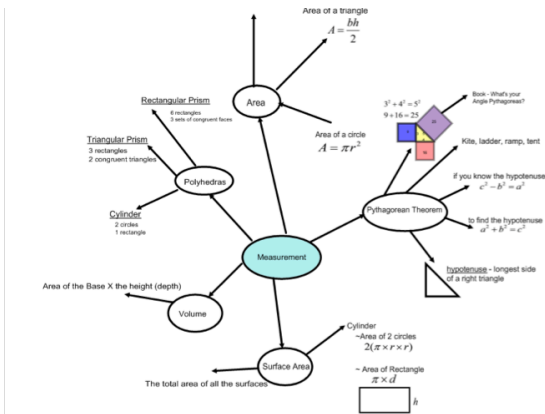
Teachers Share Demonstrations of Student Understanding

He was saying he was starting from a fact he knew then writing each additional multiplication fact until he reached the one he needed. This was strictly adding another group and using counting each time.



I worked with him on linking the fact that he knew into the array and building from there. Talking it out forced him to think, not just count. The image attached was not completed independently. He needs to continue to BUILD and EXPLAIN before he represents.

Planning for Teaching and Learning includes student voice. This network of concepts was built with a Grade 8 class and used to chart their learning around measurement. Students then used it to self evaluate.



CHALLENGES:

While we can offer evidence of teacher growth and change, it is important to note that the examples highlighted in this document and the artifacts that accompany it come from teachers who have actively engaged in, at minimum, 10 curriculum focused inquiries or workshops over at least 3 years. Our Challenge is to keep up this level of support if the goal is to allow every teacher to actualize this curriculum at every grade level.

LESSONS LEARNED:

Those who study curriculum change warn us, this is a complex, long term venture, a shared responsibility that must be supported by a systemic process that adapts and adjusts in response to the evolving complexity. "Teachers and others know enough not to take change seriously unless local administrators demonstrate through continuing actions that they should." (Fullan, 1994) Administrators, at all levels, must actively demonstrate enduring support for process coaching, expert consultation, vivid demonstrations of alternative practices, inquiry groups, and the continuing cost of resources needed to actualize the innovation within every classroom, over years, not months. They must develop and maintain an information system that provides feedback and regular updates as to how the implementation is progressing and they must demonstrate active knowledge and understanding of the expected change and the processes required to actualize that change within every classroom. The role of the principal is highly evident in the data we have gathered. The most positive growth for teachers and students comes from schools where the principal is an active agent in the change.

The role NRLC can play is in continuing to provide access to quality curriculum compatible resources, process coaching, expert consulting, vivid demonstrations of alternative practices and opportunities for inquiry groups to grow and thrive.

Year Planning Grade Five

Dispositions	Curiosity	Risk Taking	Positive Attitude	Perseverance	Contributor	Confidence
LOOK → THINK → ACT: Build → Diagram → Explain → Represent → Compare → Self-Assess and Synthesize						
Metacognition	Explain Thinking		Contrast Thinking to Others		Adjust, Adapt, Refine Thinking	Apply Strategy
	Shift Strategy or Approach		Justify Solution		Question Self	Challenge Self
Visualization	Communication	Connections	Reasoning	Mental Math/Estimation	Problem Solving	Technology
21 st Century Competencies	Critical Thinking	Creativity	Innovation	Communication	Collaboration	Leadership
PROBLEM SOLVING						
	September	October	November	December	January	February
Openers	Quick Draw Finger Facts	Balances Dot collections	Arrays (Distribution)	Two Ways Math Games- Raging Rectangles, Quip,	Math Squares	Problem Solving
Objectives	Apply mental mathematics strategies and number properties, such as:			Demonstrate an understanding of fractions by using concrete, pictorial and symbolic representations to:		Describe and provide examples of edges and faces of 3-D objects, and sides of 2-D shapes that are:

Integrated Planning: This section of a teacher's year plan makes evident that the 21st century competencies and process skills are critical components of her instructional planning.

SUCCESS Evidence of Impact on Student Learning

Spirit of the North, High Level, Anne Roberts, Principal: Our entire staff, including support staff, have had continuing opportunities to engage in study, reflection and coaching thanks to the support offered through NRLC. We believe that support to have played a critical part in the gains we saw with PATs for Grade 6 this year.

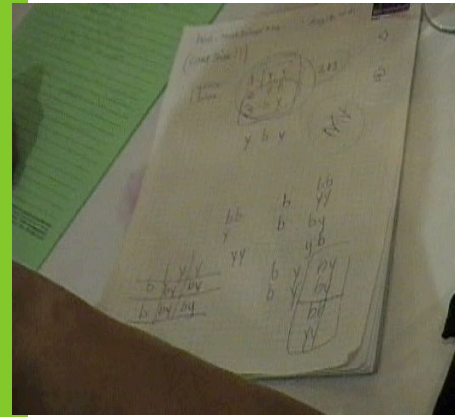
Grade 6	Acceptable Standard	Excellence
2010-2011	71.6 %	10.4 %
2011-2012	85.20%	14.80%

CHALLENGE: As is evidenced by all the current literature on change, curriculum implementation is a systemic complex process. The professional development supports that NRLC can provide to a team, school or District represents one node in a intersecting network of factors.

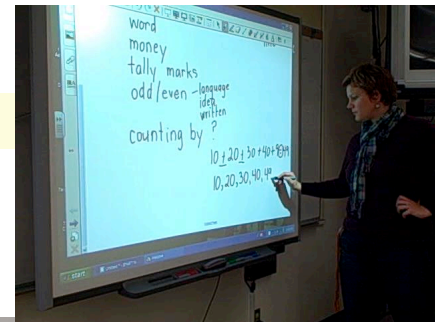
SUCCESS Unrelenting Focus on Curriculum

Our Math Support Lead, sat in on the Senior High Institute last week. I had the chance several times to sit with her during the day. It was amazing. If that day doesn't start to move some people in the right direction, then nothing will. Kudos for such a well orchestrated and professionally appropriate day, message and speaker. There was a clear fit to the intent of this curriculum and to facing the challenges that it brings to dealing with instruction and assessment in the classroom. I would add that your brief introduction and final statements were excellent as you reminded the group that this is not a me alone in my classroom change, but that we must and are all at every grade level working together to make this curriculum a reality. (I enclose a copy of my work, I am still trying to figure out the gorillas?)

Jessie Shirley, Assistant Superintendent, Grande Prairie Catholic Schools



Sorting, categorizing and re-sorting outcomes keeps the focus on curriculum



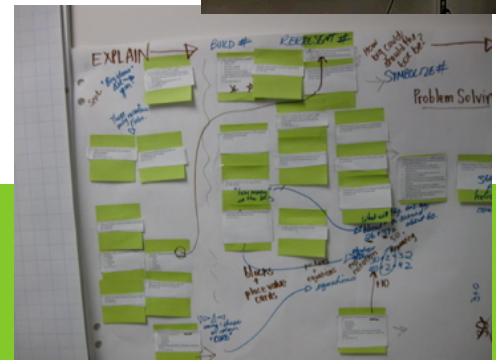
And Its Impact on Teachers as Leaders

When I started my position as AISI Math Coordinator for Division 1&2 at PWS, the first person I went to for guidance was Geri Lorway, NRLC math consultant. The NRLC model for supporting Districts allowed me access to her coaching and expertise. NRLC was able to design and facilitate workshop opportunities that matched my needs with the project, as those needs arose.

Her first and most important advice: learn my curriculum. The model Geri shared for sorting and categorizing outcomes has had a huge impact on the way I work with teachers. I use it in all my presentations and coaching sessions. Geri's enthusiasm and passion are backed by research and an incredible web of contacts that she has around the globe. Her recommendations on speakers, topics and activities focus consistently on Alberta Curriculum and putting students first. Through Geri, I met and worked with Dr. Grayson Wheatley, who graciously provided me coaching and support with building a set of problems to use for gathering evidence on my project. Over the course of our 3 year working relationship we have moved from mentorship to peer coaching. Geri and I have presented together at AISI and McATA. . <http://education.alberta.ca/teachers/aisi/videos/conference-showcase.aspx>

Some of the work we created together that has been used by other school divisions and I respond on a regular basis to requests for "my" expertise from teachers around the province, not just my Division. I cannot give enough credit to NRLC for providing me access to an expert like Geri. I have become a teacher leader, have been asked to present at events like McATA and this year assumed a new role as a coach for a 21st Century Learning Project in my division.

Corry Stark, AISI Lead, 21st Century Project Coach, PWS.



CHALLENGE Maintain the balance of funding, support and responsibility across a time frame that will allow the time this work requires to reach every teacher in every school. Requests for support at all grade levels continue unabated. This curriculum is still in the adoption stage.





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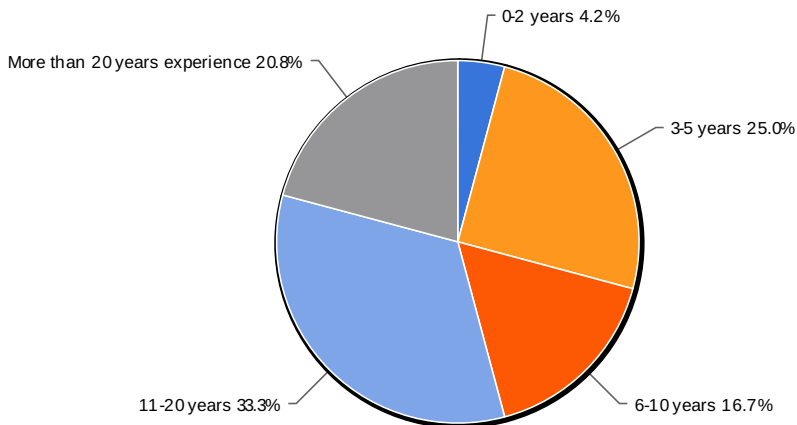
Appendix:

June Survey Result

Summary Report - Jul 5, 2012

Survey: NRLC High School Math Needs Assessment 2012-2013

Indicate your years of teaching and/or administration experience.

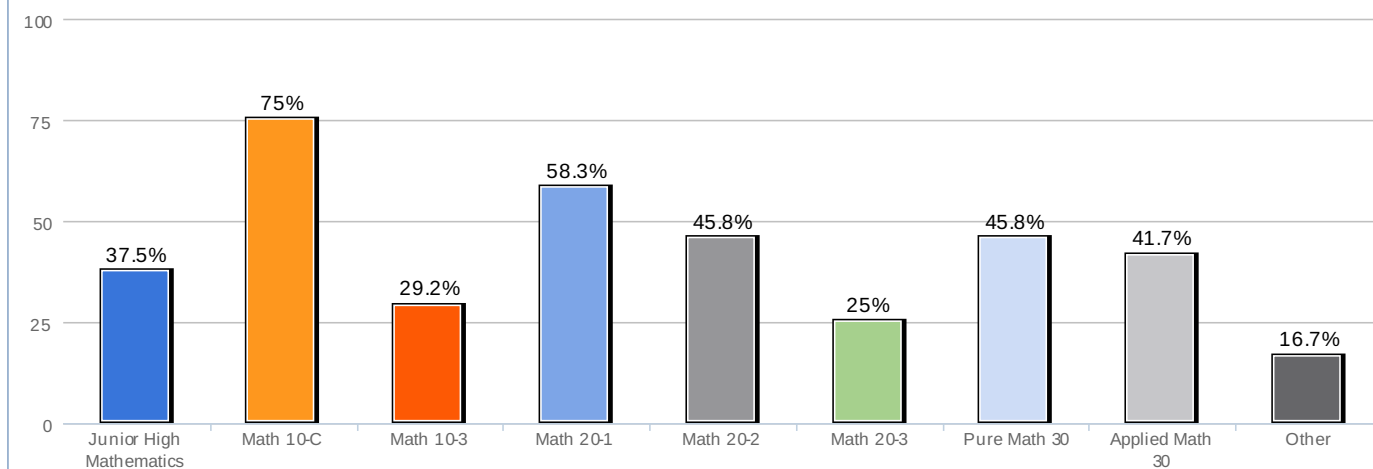


1. Indicate your years of teaching and/or administration experience.

Value	Count	Percent
0-2 years	1	4.2%
3-5 years	6	25%
6-10 years	4	16.7%
11-20 years	8	33.3%
More than 20 years experience	5	20.8%
Other	0	0%

Statistics	
Total Responses	24
Sum	130.0
Avg.	7.2
StdDev	3.55
Max	11.0

Indicate the course(s) that you teach. Please choose all those that are applicable.



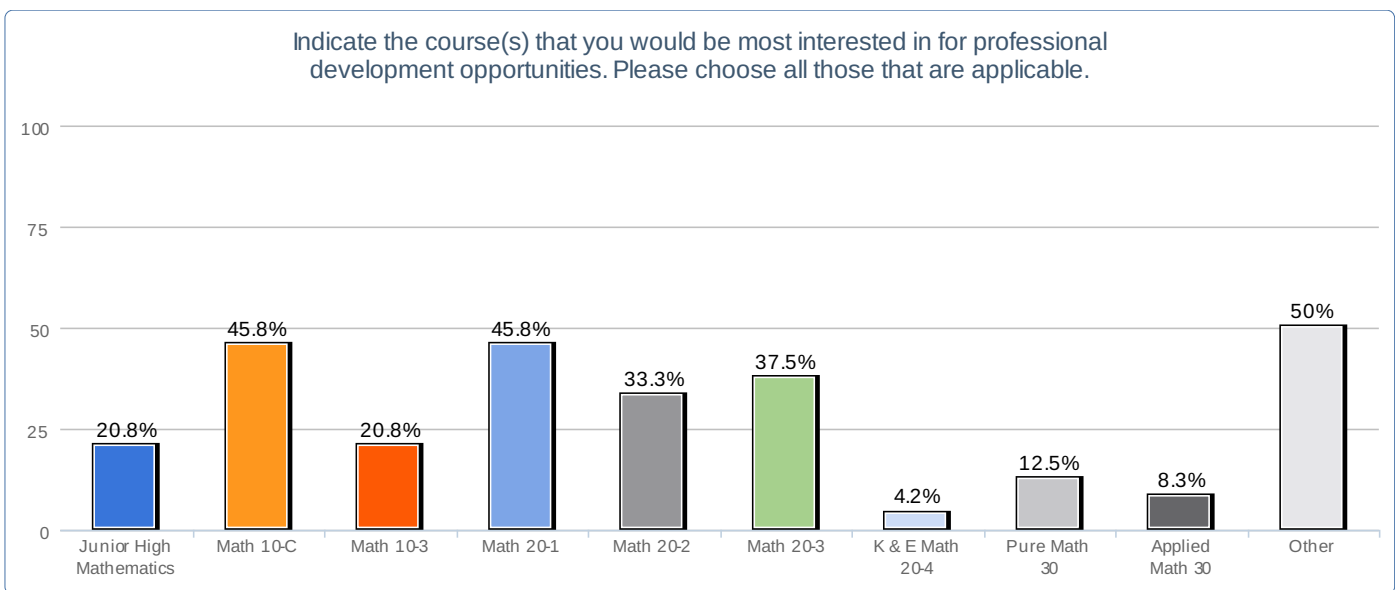
2. Indicate the course(s) that you teach. Please choose all those that are applicable.

Value	Count	Percent
Junior High Mathematics	9	37.5%
Math 10-C	18	75%
Math 10-3	7	29.2%

Statistics	
Total Responses	24

K & E Math 10-4	0	0%
Math 20-1	14	58.3%
Math 20-2	11	45.8%
Math 20-3	6	25%
K & E Math 20-4	0	0%
Pure Math 30	11	45.8%
Applied Math 30	10	41.7%
Other	4	16.7%

Open-Text Response Breakdown for "Other"		Count
CTS (FAB and CON), sciences		1
IB Math and Math 31		1
Math 31		1
Math coordinator		1



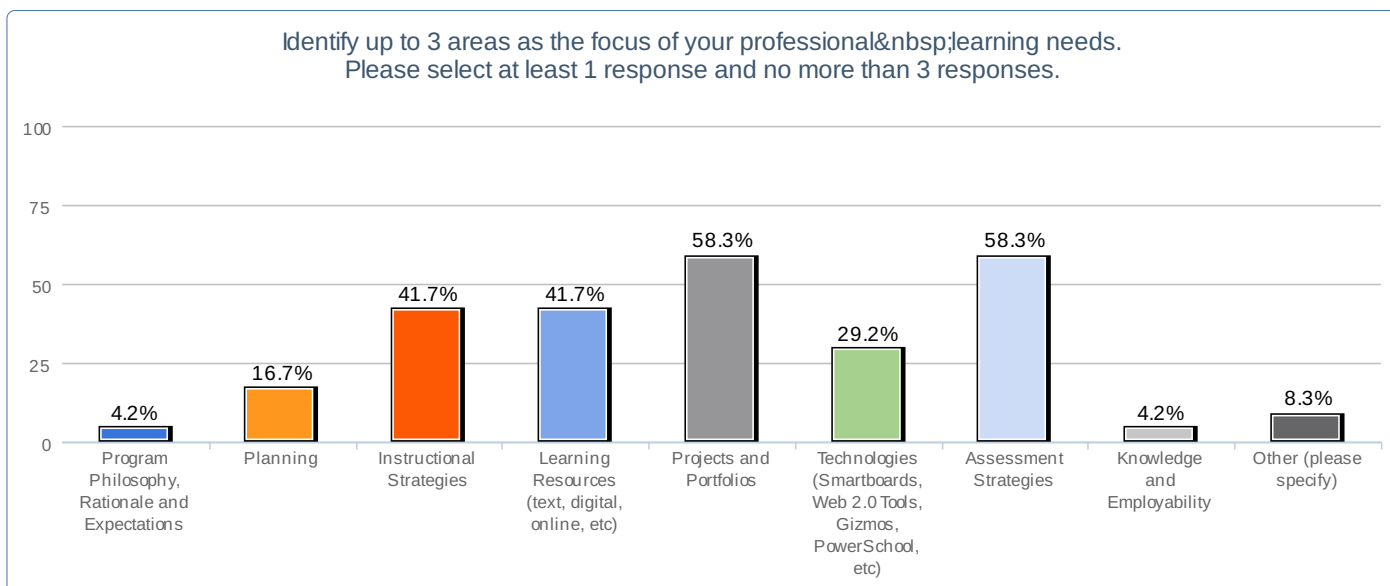
3. Indicate the course(s) that you would be most interested in for professional development opportunities. Please choose all those that are applicable.

Value	Count	Percent
Junior High Mathematics	5	20.8%
Math 10-C	11	45.8%
Math 10-3	5	20.8%
K & E Math 10-4	0	0%
Math 20-1	11	45.8%
Math 20-2	8	33.3%
Math 20-3	9	37.5%
K & E Math 20-4	1	4.2%
Pure Math 30	3	12.5%
Applied Math 30	2	8.3%
Other	12	50%

Statistics	
Total Responses	24
Sum	90.0
Avg.	30.0
Max	30.0

Open-Text Response Breakdown for "Other"		Count
30-1 and 30-2		1
30-2		1
30-2 and 30-2		1

CON/FAB, Math 30-1	1
Math 30-1	2
Math 30-1 and Math 30-2	2
Math 30-1/30-2	1
Math 30-2	1
drama	1
math 30-2, or 30-1	1



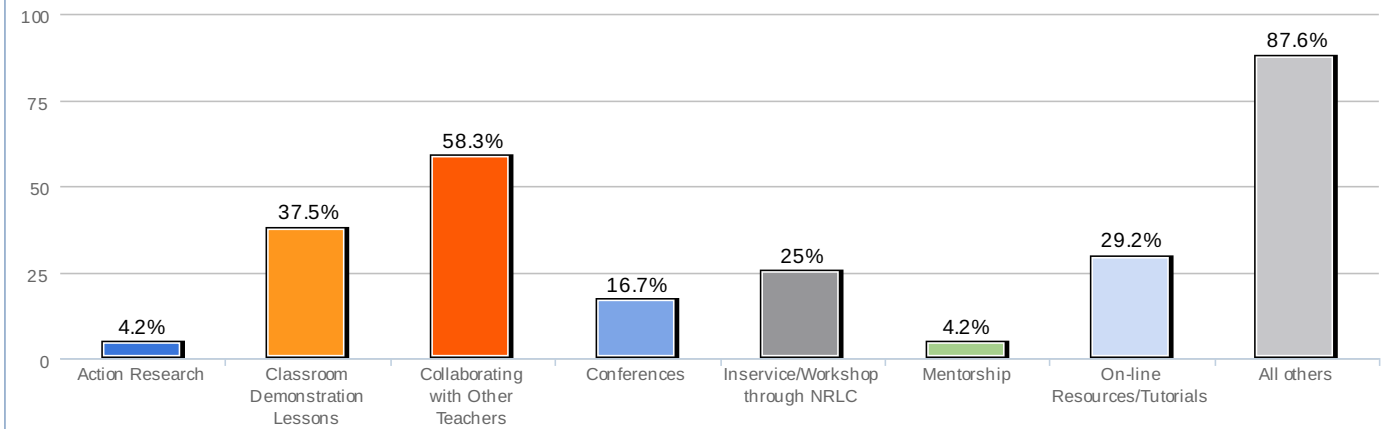
4. Identify up to 3 areas as the focus of your professional learning needs. Please select at least 1 response and no more than 3 responses.

Value	Count	Percent
Program Philosophy, Rationale and Expectations	1	4.2%
Planning	4	16.7%
Instructional Strategies	10	41.7%
Learning Resources (text, digital, online, etc)	10	41.7%
Projects and Portfolios	14	58.3%
Technologies (Smartboards, Web 2.0 Tools, Gizmos, PowerSchool, etc)	7	29.2%
Assessment Strategies	14	58.3%
Knowledge and Employability	1	4.2%
Other (please specify)	2	8.3%

Statistics	
Total Responses	24

Open-Text Response Breakdown for "Other (please specify)"	Count
Course design for online or blended courses	1
TI calculators	1

Indicate the types of professional development activities in which you would like to participate. Please select at least 1 response and no more than 3 responses.



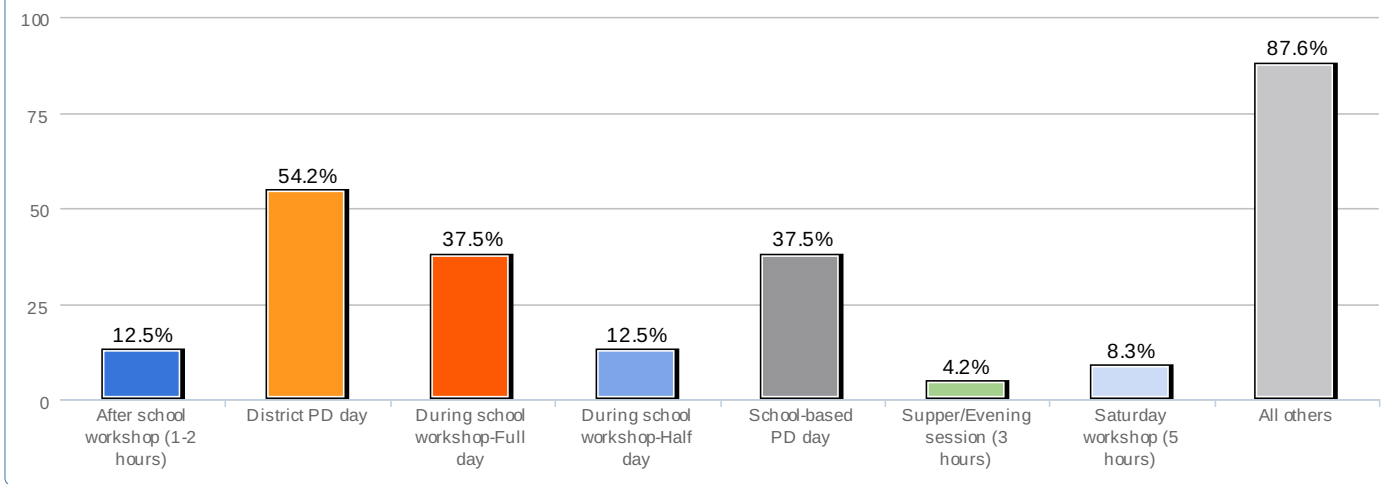
5. Indicate the types of professional development activities in which you would like to participate. Please select at least 1 response and no more than 3 responses.

Value	Count	Percent
Action Research	1	4.2%
Classroom Demonstration Lessons	9	37.5%
Collaborating with Other Teachers	14	58.3%
Conferences	4	16.7%
Inservice/Workshop through NRLC	6	25%
Mentorship	1	4.2%
On-line Resources/Tutorials	7	29.2%
On-line Webinars	5	20.8%
On-line Symposium with session choice	2	8.3%
Organized Book Study	1	4.2%
Professional Learning Community (On-going team Learning)	7	29.2%
Professional Reading	1	4.2%
Study and/or Discussion Group	3	12.5%
Video Conference	0	0%
Working with a Peer Coach	1	4.2%
Other (please specify)	1	4.2%

Statistics	
Total Responses	24

Open-Text Response Breakdown for "Other (please specify)"	Count
working with ms coy and the online moodle provincial math group that we are not a part of	1

Indicate the best times for you to attend professional development activities.
Please select at least 1 response and no more than 3 responses.



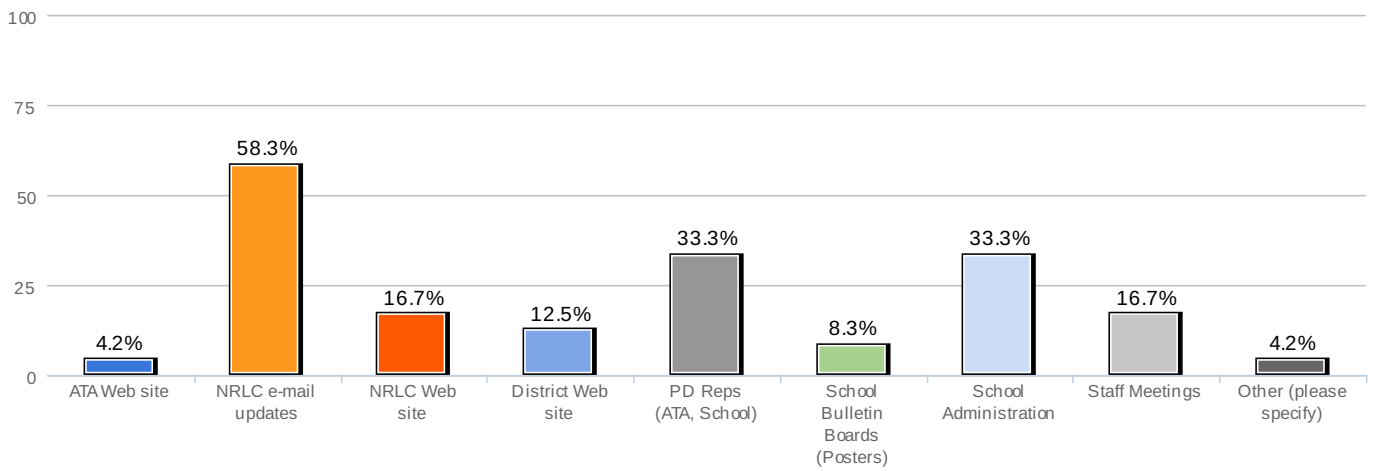
6. Indicate the best times for you to attend professional development activities. Please select at least 1 response and no more than 3 responses.

Value	Count	Percent
60-90 Minute Presentations	0	0%
After school workshop (1-2 hours)	3	12.5%
District PD day	13	54.2%
During school workshop-Full day	9	37.5%
During school workshop-Half day	3	12.5%
School-based PD day	9	37.5%
Supper/Evening session (3 hours)	1	4.2%
Saturday workshop (3 hours)	0	0%
Saturday workshop (5 hours)	2	8.3%
Teachers' Convention	13	54.2%
Weekend workshop (2 days)	1	4.2%
Multiple Series over time (3-5 workshops)	5	20.8%
Summer Institute (2-3 days)	1	4.2%
Summer workshop (1 day)	0	0%
Other	1	4.2%

Statistics	
Total Responses	24

Open-Text Response Breakdown for "Other"	Count
exam break	1

How would you like to receive information about possible PD opportunities?
Please select at least 1 response and no more than 3 responses.



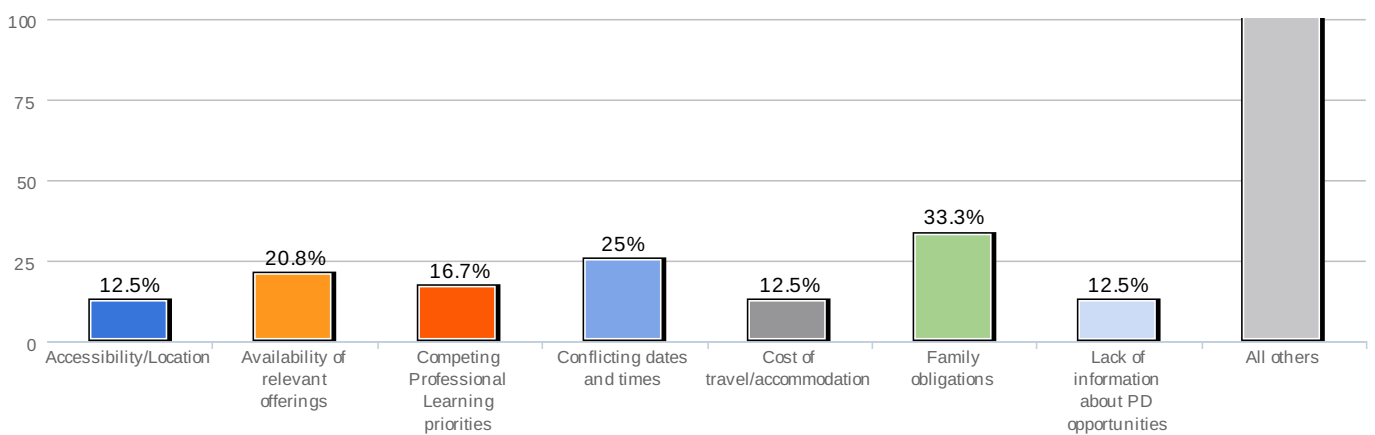
7. How would you like to receive information about possible PD opportunities? Please select at least 1 response and no more than 3 responses.

Value	Count	Percent
ATA Web site	1	4.2%
NRLC e-mail updates	14	58.3%
NRLC brochures (mailed to schools)	0	0%
NRLC Web site	4	16.7%
District Web site	3	12.5%
PD Reps (ATA, School)	8	33.3%
School Bulletin Boards (Posters)	2	8.3%
School Administration	8	33.3%
Staff Meetings	4	16.7%
Other (please specify)	1	4.2%

Statistics	
Total Responses	24

Open-Text Response Breakdown for "Other (please specify)"	Count
e-mail	1

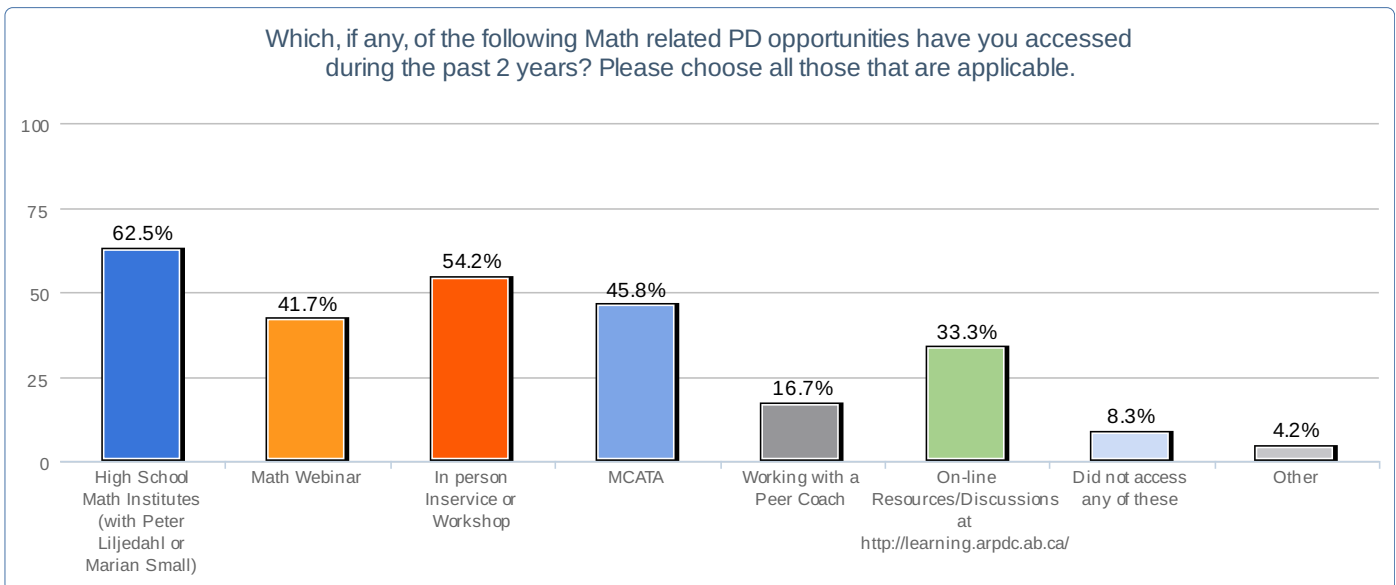
What, if anything, do you feel limits your participation in professional learning activities? Please select all those that are appropriate.



8. What, if anything, do you feel limits your participation in professional learning activities? Please select all those that are appropriate.

Value	Count	Percent
Accessibility/Location	3	12.5%
Availability of relevant offerings	5	20.8%
Competing Professional Learning priorities	4	16.7%
Conflicting dates and times	6	25%
Cost of registration	0	0%
Cost of travel/accommodation	3	12.5%
Family obligations	8	33.3%
Lack of information about PD opportunities	3	12.5%
Lack of interest	2	8.3%
Lack of school-based funding	1	4.2%
Substitute availability	5	20.8%
Substitute teacher costs	3	12.5%
Times that sessions are offered	5	20.8%
Time away from students	17	70.8%
Too much of a time commitment	3	12.5%
No barriers to attendance/participation	0	0%
Other (please specify)	0	0%

Statistics	
Total Responses	24



9. Which, if any, of the following Math related PD opportunities have you accessed during the past 2 years? Please choose all those that are applicable.

Value	Count	Percent
High School Math Institutes (with Peter Liljedahl or Marian Small)	15	62.5%
Math Webinar	10	41.7%
In person Inservice or Workshop	13	54.2%
MCATA	11	45.8%
Working with a Peer Coach	4	16.7%
On-line Resources/Discussions at http://learning.arpdc.ab.ca/	8	33.3%
Did not access any of these	2	8.3%
Other	1	4.2%

Statistics	
Total Responses	24

Open-Text Response Breakdown for "Other"	Count
Masters Program	1

10. Identify other Professional Learning needs that you have now or anticipate in the future.

Count	Response
1	CTS (CON and FAB), perhaps academic counselling
1	Would like to look at various assessment strategies - what might it look like to have an assessment (task or interview) at the beginning of a unit, and then use those results to see what the student needs to focus on (and what they already know) - help to individualize the course for the student. Would need some useful rubrics to help assess during the teacher/student interview. Might also be interested in math portfolios that shows student understanding deepening.
1	I would like to know what other teachers are thinking about organizing their 30-2 class and how they are incorporating the project. I would also like some support for the -3 stream. I feel like there are very limited opportunities for PD specific to these courses. Specifically I am interested in suggestions on how to keep students motivated and ways to make the class interesting and exciting for students who are reluctant learners in mathematics. Making links to applications outside the classroom is another priority for these classes and how to specifically address the literacy difficulties that I encounter in this class.
1	I would like anything that would help me with different ways to present topics - other than teacher-directed.
1	I'd like to continue to work on the new assessment techniques that Spencer Pinnock introduced in May in Peace River.

11. General comments: Please include any other comments you would like to make about your professional learning needs related to implementing the new Mathematics Program of Studies.

Count	Response
1	I would like to see more workshops for 20-1, 20-2 and 30-1, 30-2 that are similar to what was done for the implementation of 10C.
1	Now that I have the basics set up for my math10-3 and 20-3 course, I believe I am ready to look at those courses more closely and see what I can do to help deepen understanding and bring in the intent of the curriculum in a meaningful way (in small steps that are achievable and not too overwhelming of a time commitment)
1	Sometimes PD for new courses is at least as effective after I have taught the course once as when it first comes out. That way I can actually implement the ideas instead of trying to "survive". Peace Wapiti has enough PD that it is hard to get to the NRLC sessions. Having sessions on days other than the Division Wide PD days would help in this regard.
1	There is a provincial math group that is on moodle and they have created math projects for high school math. Our math teachers are not a part of this group and i think ms. coy should come down for a day to show us and add us to the group. The sooner she can come down the better. Also we need time to finish our division final exams. Slave Lake has to be a part of this because we are a small group
1	I am finding it hard to have students wanting to participating in activites and projects. They are wanting assignments and worksheets because they know they don't have to think on their own. Need more ideas to get them motivated to take their learning in their own hands with projects.