Executive Director: Karen Egge
karen.egge@gppsd.ab.ca
Math Project Coordinator: Geri Lorway
glorway@telusplanet.net

Reflections from the Field: Successes and Challenges
Math Implementation 2010-2011

Designing and implementing effective professional development is a cyclical, recursive process that requires thoughtful planning, over time. Throughout the process, our challenge is to continually scan the environment and the horizon to identify emerging needs and newly developing concerns in order to revise, and adopt our professional development offerings.

Collaboration, Coaching, and Capacity Building:
Three key words that capture the evidence of success with, and continuing challenges for, providing support to Alberta teachers as they "learn" to implement the Alberta Program of Studies for Mathematics, 2007/2008.

In reality 'learning' and 'change' are synonymous. Change is not an issue if it makes sense to and is 'owned' by those involved, rather than being arbitrarily imposed. An appreciation that change is a continual process, involving confusion and difficulty, is vital for learners.

Success #1.
Grade Level Specific Workshop Series

The NRLC approach is designed to allow teachers time to study, experiment with and learn to take ownership of this changing curriculum by providing Grade specific workshops set up over a series of days, or supplemented with follow up in schools or through Elluminate sessions. Each series begins with teachers digging into, cutting apart, sorting, and classifying the outcomes. This exercise illuminates the changes in ways that pre- made comparison charts cannot. Each day in the series is planned to include activities that immerse teachers in:

- active engagement with the mathematics they teach in ways that promote understanding
- demonstrations of instructional strategies that maximize student engagement and active participation
- the study and comparison of authentic samples of student work. The three elements critical to impacting teacher practice in any professional development or learning initiative built to engage math and science teachers.

(Loucks-Horsley et al, 2003, 2006; NSCD, 2005; NSF, 2006; Richards, 2005)

The workshop series for 2010-2011 focused on Grades 3, 6 and 9. Several of our partner districts built them into their implementation planning and provided teachers with funding to allow them to attend. Whenever possible the workshops were held in schools so that demonstration lessons could be included in the day.

Comments on evaluation forms indicate that many of the teachers credited this school embedded model as a catalyst to changes in their practice.

"*The Grade 9 series with Jackie was incredible. She kept us busy doing, thinking and discussing. I left with so many ideas I wanted to apply in my classroom. She gave us homework and I did it with my students.... My regret: Not enough time once I am back in the classroom to think and plan and put these ideas into play... I have lots more I want to do with my students but I run out of time to organize and plan and experiment because there is so much to take care of once I am back in the classroom. I want it all to change now, because I see kids more engaged, more interested, more willing to try."*

"I like that we do a day, go to our classrooms and try some things, then bring back samples to discuss. Each day we focus on new parts of the curriculum. I feel like I am developing a risk taking attitude and am more willing to try things with my class."

As the implementation has rolled out through the grades, we have run each Grade level series for a minimum of two years so that teachers could begin their study during the pre implementation year, then continue it into the implementation year for their grade. This has allowed teachers who are willing to participate in 6 to 8 days of professional development over the two years.

Evidence of the capacity within this model to build leadership:
A Grade 3 teacher who was participating in the Grade 3 workshops was approached to work with the math consultant to co-plan and team teach the Grade 3 series planned to be delivered in two different sites for 2010-2011. By the second day of the series, the Grade 3 teacher was developing and delivering the majority of the material and for the remainder of the year took over as lead presenter. The same held true for the Grade 6 series which was also delivered by a teacher in two sites.

Nine teachers who participated in the Junior High series, worked with the Junior High Math Consultant to develop and co-present sessions at MP Teacher's Convention in March. (Sessions were grade specific: Grade 7, Grade 8 and Grade 9).

The Challenges Inherent in this Workshop Model:
NRLC can design workshops using the principles from research, facilitated by high quality presenters, but we cannot control the myriad of obstacles that keep teachers from attending: concerns over time away from the classroom, time to prep for subs, lack of subs, time for travel, competing priorities for change initiatives, competing priorities for PD, fear of change, fear of risk taking, lack of collegial support, lack of courage: the reasons that teachers and administrators list are well documented in the literature and well beyond our control.
(Ball, 2009, 2010, 2011; Cuban, 2011; Richards, 2002; Fullan, 1992)

"Making changes to the complex, internalized skills, beliefs and knowledge of classroom teachers is recognized as difficult and time-consuming. Effective study of a new model of teaching can be assumed to take as many as twenty to thirty hours, effective learning of the model will require at least fifteen to twenty active demonstrations.
(Joyce and Showers, 1992, 1997, 2002; Joyce, Showers and Bennett, 1996)

"To learn a "moderately difficult teaching strategy could require that teachers receive 20 to 30 hours of instruction in its theory, 15 to 20 classroom demonstrations, and 10 to 15 coaching sessions before mastering the technique and incorporating it into routine classroom practice" (Purnell & Hill, 1992).

NRLC can design, hands on, minds on workshops delivered by highly engaging, knowledgeable and experienced presenters but we cannot force teachers to engage or motivate themselves to participate:

"I noticed that there were a number of people in the sessions not engaged. They were told they had to be there and their attitude made evident they did not want to be. When it came to the Elluminates, only those of us who wanted to came and that is where you noted how many were absent. I cannot believe not wanting to have these opportunities to learn more about students, and teaching and mathematics." (Grade 9, math 12 years)

Success #2.
Elementary and Junior High Cohorts

NRLC sponsors two teachers from each District to participate in an Elementary cohort and two in a Junior High Cohort. The first task (2009-2010) the cohorts took on was to immerse themselves in the curriculum, unpacking outcomes, interpreting achievement indicators and connecting the goals, processes and natures of mathematics statements from the front matter to a set of common beliefs and understandings. The document that resulted maps the development across the grades of key topics of study in number, measurement, shape and space.
(See Appendix A)

While members of the cohort have shared this document with teachers in their schools and PLC's, they believe that the value of the document was in the inquiry time they spent immersed in creating it. And so the cohorts approached their first challenge: Was the major value in this exercise more about team building as cohorts than providing a support document for colleagues?

This led to a new focus in their discussions:
When confronted with the challenge to teach through problem solving as opposed to teaching and then problem solving teachers frequently ask…

What does it look like in the classroom? What will it look like with "my" students?"

Teachers in the cohort decided to move their attention (2010-2011) to designing, developing, testing in their classrooms, gathering exemplars for and developing assessment tools around problems that might be used by colleagues to uncover student understanding and to support collegial conversations focused around what constitutes mathematical thinking at each grade level.

- An example of a framework for implementing and evaluating problems is attached in Appendix B.
- An emergent rubric that the teams are working with. See Appendix C.

As cohort members studied, compared and reflected on experiences and samples from their classrooms several mini movies were developed that highlight teachers working to unpack, direct or identify student understandings. These mini movies are the first rough samples of a set of artifacts the group hope to develop in the 2011- 2012 year.

Mini movie samples:

Ideas on Equal: Teacher Reflection on Practice Grade 2
www.youtube.com/watch?v=4_U5l0GHIuc

Kindergarten Subitize
www.youtube.com/watch?v=burYkuayQrc

Grade One Giant Exploration: Thoughts about Measurement
www.youtube.com/watch?v=S0_OZ1EXQ0Q

Markbook Presentation: Peter Liljedahl 2 Parts
http://www.youtube.com/watch?v=q1OSKWh3_rI

Grade Nine: Reflection on Teacher Questioning
http://www.youtube.com/watch?v=c20s9qO_uGo
http://www.youtube.com/watch?v=cJAguHdEo5Y

Evidence of the capacity within this model to build leadership:
Members of the cohorts have presented at staff meetings, Parent councils, Administrator Meetings, grade level PLC's, ATA PD days, Teacher Conventions, after school sessions and some have opened their classrooms to invite colleagues to observe their teaching, either face to face or through video. Last year we documented 162 separate events, approximately 4 per cohort member.

Challenges Inherent in Cohort Models:
In order to become a viable cohort, members must come to share a common vision, the language to describe that vision and the set of beliefs and attitudes it is grounded in. With only three (3) days in the year to meet, this is not a simple task, made even more complex by the number of changes in roles and responsibilities that occurred during the school year for some schools and districts. Changes that forced some cohort members out, traded some in, or simply left unfilled vacancies. The work of both cohorts has been interrupted by inconsistent membership.

Again, NRLC can build a space for developing capacity, but we have little control over how districts choose to take up that capacity and put it to use. The likelihood that teachers who participate in these cohorts will develop into leaders or coaches is directly related to the types of support they are provided within their schools or districts.

The cohort members from four (4) of our partner districts were already identified in coaching or leadership roles. This professional learning opportunity has allowed them to build their knowledge and skills both with curriculum and with coaching.

While NRLC supports two (2) teachers from each district to participate in each cohort, we did not set limits on the number of teachers a district could sponsor. Grande Prairie Public school has nine (9) teachers involved in the Elementary cohort, and two (2) with the Junior High. The district then provided several opportunities for those teachers to meet as a whole, to devise a plan for supporting each other and for providing support for colleagues. By the spring of 2011, that team had presented a number of after school sessions and all had participated in at least one classroom demonstration.

The materials included in the Appendix attest to the commitment of cohort members to study student work, build exemplars to share with colleagues and, to open their practice to colleagues in the coming year.

'You cannot carry out fundamental changes without a certain amount of madness. It comes from non-conformity, the courage to turn your back on the old formulas, the courage to invent the future. It took madmen of yesterday for us to be able to act with extreme clarity today. I want to be one of those madmen.'
Thomas Sankarra African Congress.

(See Appendix D for report on successes with Senior High Support, 2010-2011)
(Appendix E for summary of supports specific to Senior High, 2010-2011)
(Appendix F for summary of workshops for K to 9, 2010-2011)

Success #3.
Direct to District Consulting Days:
Another success in our approach to providing support is the 3 days of support we have been willing to provide to each of our districts. Those days are used in a variety of ways... with varying levels of success.

In one of our more remote Districts, bringing in the consultant to offer in school workshops and after school dinner meetings was the catalyst needed to create a district wide math planning team. That team then contracted a pilot project to gauge the feasibility and potential of running District wide, grade level, technology-mediated PLC's.

In the spring of 2011, NRLC supported a plan for one hour sessions for each grade level from 1 to 6. The sessions were held during the working day and facilitated through Elluminate. Teachers who participated were positive about the potential for this form of PD and the committee is looking to build a plan to continue support for the 2011-2012 school year.

In another district our math consultant provided direction and expertise to guide the collection of data an AISI project. That project has been able to document achievement growth for students.
(See Appendix G)

Three of our partner districts have instructional coaches working with their teachers and those coaches receive direct and indirect support and guidance from our NRLC consultant.

Providing these direct to district days has been a catalyst for developing the desire to change in a number of schools and districts. Most specifically there has been an impact on Administrators. In a number of districts, the math consultant has been asked to present to Administrators and/or provide demonstrations in schools. Administrators are instrumental to the success of any curriculum implementation. Below is the comment that an administrator who is now engaged in a school wide coaching project being lead by his math department made after participating in a demonstration by the consultant:

"I watch how you dealt with the students, the patience, the wait time, the time and opportunity you gave them to explain their thinking, to compare it to others, how you made every student feel important and I realize I am not interacting with students the way I should and neither are the teachers. We rush through everything too quickly and we judge their answers before they are finished giving them.. I walk around the school and see that teachers are not taking the time to engage students first..... we need to have more in school coaching. More opportunities for teachers to see ways to work with kids that engage them emotionally, socially and intellectually." (Principal, Senior High)

And the comment from a 27 year veteran math teacher/ex Administrator, who returned to his school after participating in a demonstration lesson with our math consultant and convinced his principal to initiate similar visits:

"If we are going to do any PD around math it should be like this.... In this half day with Geri, we discussed some common understandings, went in and watched a demonstration lesson with Grade 8, then came back and shared our reflections and discussed what we should do in our own practice. I hope there is a next time so we can learn more from each other. But just telling teachers to go watch each other won't work. What made this work was the facilitation by someone who kept us focused on asking questions, not letting us fall back on our old assumptions. We cannot change if we do not know what to change into?"
(Grade 5 to 12, math teacher, 27 years experience)

Building a Senior High Cohort

It is important to note, as have my colleagues in other consortia, that a significant portion of the data pertinent to a comprehensive understanding of, requests for, participation in and, effects on the classroom, of professional development opportunities in support of implementation of the revised Senior High Math Curriculum resides in the implementation plans generated by, our NRLC partner Districts. Data concerning student participation rates, success rates, scheduling of courses, teacher preparedness, adaptations to current evaluation and reporting systems, school instructional supports, school administrative supports, parent awareness, supports available to assist parents and students in choosing courses, decisions on how to schedule and populate specific courses and how and when to gather and respond to parent feedback fall within the domain and discretion of School Districts.

Designing and implementing effective professional development is a cyclical, recursive process that requires thoughtful planning, over time. Throughout the process, our Consortia challenge is to continually scan the horizon so as to identify and respond as quickly as possible to the needs and concerns off our constituents as they emerge in the field In the complexity off our current environment we then work to revise, adapt and refine our professional development offerings so as to provide appropriate support.

Our Successes with Senior High Implementation Supports

1. **Participation** in the Senior High Provincial Institutes has been consistent and positive.
2. **Site Based PD.** As part of our overall NRLC math plan we have offered grade specific series' designed to promote teacher experimentation, risk taking and reflection on practice. Last year we moved our Grade 9 series into several High Schools with excellent results. Most if not all of the teachers in the high schools teach more than just Grade 9. Our facilitator was flexible and experienced enough to be able to widen her focus to include activities, investigations and demonstrations of engaging practices that can be applied into the Common and Dash 3 courses for Grade Ten. Participating teachers asked for a follow up series to continue in their schools for this present year and comments on evaluation forms indicate that many give credit for this school embedded model as a catalyst to changes in their practice. As second feature of this model, because they are meeting at a school site, the presenter has been able to include demonstration lessons in the sessions.

"Making changes to the complex, internalized skills, beliefs and knowledge of classroom teachers is recognized as difficult and time-consuming. Effective study of a new model of teaching can be assumed to take as many as twenty to thirty hours, effective learning of the model will require at least fifteen to twenty active demonstrations. (Joyce and Showers, 1992, 1997; Joyce Showers and Bennett, 1996)
To learn a "moderately difficult teaching strategy could require that teachers receive 20 to 30 hours of instruction in its theory, 15 to 20 classroom demonstrations, and 10 to 15 coaching sessions before mastering the technique and incorporating it into routine classroom practice" (Purnell & Hill, 1992).

Our Challenges

Sparsity: There are great distances between schools. Many have only 2 or 3 math teachers, time, travel and low numbers strain budgets. We consider a group of 12 to be a huge success. We find more often 3 to 6 is our participation rate. While small groups can increase comfort and trust levels, too small a group can be detrimental to building the kind of rich dialogue that results in deep learning.

Lack of Substitute Teachers: In most schools finding substitute teachers is becoming an issue and certainly substitutes who can teach Mathematics at the Senior High level are exceedingly rare.

Teacher Reluctance to miss classroom time: Course loads, coaching and school responsibilities are such that teachers feel they are negatively impacting student learning when they leave their classrooms.

Technology Mediated Events do not appeal to all learners: Our best successes with technology mediated pd occur when the teachers involved have participated in several face to face meetings with the facilitator and there is a coach available as for their first few interactions on line.

Common topics of discussion around math implementation have been:

1. Teaching through problem solving as opposed to teaching and then problem solving. What does it look like in the classroom? What will it look like with "my" students?"
2. Adapting to the gaps in student abilities and understandings as implementation proceeds at different rates and levels of success across grades and schools. The implementation is still rolling out. Are we seeing a different student yet?
3. Support for aligning current reporting procedures and practices with a curriculum that values process above procedures in mathematics***. Please note, building assessment tasks, common tests, adapting and refining approaches to unit tests and projects is not the concern here.***

The number one question theme we hear in the field is:

How do I mark this? What do I weight? How much do I weight it? How will percentages fit? Will parents, students, receiving institutions accept a marking system that values process above procedure?

In order to provide for these concerns, in our planning for next year NRLC coordinators hope to identify and provide to schools and Districts time with lead teachers who are able and willing to:

- Model demonstrations of teaching that is focused on problem solving approaches in any course.
- Provide examples of the changes they have made to their Markbooks.
- Provide examples of student work and marking plans for that work as they implement the 20 level courses
- Facilitate and support continuing conversations around evaluation and reporting.
- Provide coaching at the school level.

FINAL REFLECTIONS

Because professional development is an ongoing event based on an ever evolving process that partners a wide range of stakeholders, NRLC believes that all members of that partnership will best be served through sharing resources, recognizing expertise within the region and designing professional development, in-service, and training activities that are dynamic, organic and evolutionary in their nature. Collaboration-Coaching and Capacity Building. Professional learning opportunities evolve, morph and grow in response to the environment within which they are embedded.

"The support available to us from NRLC continues to remain flexible and organic. As they emerge, our concerns and needs surrounding effective implementation of such a complex curriculum are met in a timely and expert manner. The quality of facilitation and the depth and richness of the investigations opened for teachers during the workshops, dinner meetings and summer Institutes that NRLC have offered our teachers, combined with the high level of expertise with coaching and curriculum that Geri provides as a consultant and co-ordinator is outstanding. We ask, it happens. We said we need more Geri's, she got us Jackie and Susan. Now we need to build our own and that is what is beginning to emerge from the support our teachers in the cohorts are getting. We are using Geri to coach our coaches."
(Assistant Superintendent)

THE CHALLENGES FOR TEACHERS

- Finding the time within their already busy working days to engage in deep and connected study of their practice.
- Learning to teach in ways they were never taught: "Making changes to the complex, internalized skills, beliefs and knowledge of classroom teachers is recognized as difficult and time-consuming. We teach as we were taught. There is a great deal of unlearning to do." Philippa Cordingley

- "Moving in the direction of the mathematics reforms means confronting the uncertainties, ambiguities and complexities of what "understanding and "learning" might really mean and entail." The ultimate challenge for teachers is to thrive and grow within an environment that guarantees only uncertainty, ambiguity and complexity.

THE CHALLENGES FOR NRLC

NRLC has no control over teachers' decisions to access opportunities. We have attempted at every opportunity to break down barriers by providing opportunities at minimal cost, by sending coaches and presenters into schools, by including demonstrations in our presentations, by responding immediately to requests for events, by providing the funding for two teachers from each District to participate in our leadership cohorts, by providing free to Districts consulting time., by providing technology mediated options for study, by providing specifically requested Senior High Workshops.

We have sought out and brought in the best of the best when providing support for teachers. We have made available to teachers immensely talented, experienced and grounded in research presenters and coaches who focus on building teacher capacity, not selling materials or promoting "programs".

Teachers in the 21st century must learn to feel comfortable with uncertainty, complexity and ambiguity and those who work with them must be patient, knowledgeable and passionate. The NRLC approach has been to provide opportunities for teachers to take responsibility for monitoring their instructional growth through inquiry, reflection and collaboration. Studying content, studying instruction, studying student learning....

We believe we have maximized opportunities for teachers at all grade levels to engage in rich and connected learning experiences..... The challenge for our partners and stakeholders is to work together at all levels across all districts and into all schools to keep the focus on actualizing this revised curriculum at every grade level, in every classroom, for every student. Teachers must believe that they are all working toward a shared understanding, that the pieces critical to engaging students as confident, self aware and self assessing learners are common across all grades. This work is barely begun, if we stop now, before the wave of early implementers has crested, all that has been gained could easily be lost. There is a need to broaden the focus, to help teachers and administrators see that the goals of this mathematics curriculum: conceptual understanding, relational thinking, developing reasoning and focusing on problem solving apply to all curriculum... we cannot stop here, we cannot stop now.

Column1	Kindergarten	Grade One	Grade Two	Grade Three	Grade Four	Grade Five	Grade Six	Grade 7	Grade 8	Grade 9
Sort	One attribute	One attribute	Two attributes	One + attributes	Instructional strategy for building conceptual understandings →					
Classify	Number	1 digit, teen	even, odd, 2 digit	2 digit, 3 digit	Decimals,Fractions	Decimals,Fractions	Integers	Rational Numbers	Irrational Numbers	Real Numbers
Pattern	Repeating Patterns	Repeating Patterns	Repeating & Increasing	Growth Patterns	Relationships in tables and charts.	Pattern rules to predict.	Graphs & tables			
Represent Number	2 to 20	Number to 20	Number to 100	Number to 1 000	From 10 000 to .01ths	From 1 000 000 to .001ths	> million < thousandth	Rational	Rational	Powers
Order	One to one	Order, sequence numbers: to 20	Order, sequence numbers to 100	Order, sequence to 1000	Order, sequence decimals, fractions	Order, sequence decimals, fractions	Order operations	Fractions,Decimals, Whole Numbers		Rationals, Order of operations
Say	Number to 10	To 100 (5,10)	To 100 Flexible Start	To 1 000 ,2,3,4,5,10,100						
Estimate		Estimate quantity to 20	Estimate quantity to 100.	Estimate quantity to 1000	Sums, differences, products and quotients.	Estimation Strategies				
Equality		Equal Not Equal	EQUALITIES INEQUALITIES	Symbols in Equations	Symbols in Equations	Letter variables Coefficients	Generalizations Preserve Equality Table of Values	Linear Relations Table of Values Evaluate	Linear Relations 2 variables Integers	Rational Coefficients
Counting	Automatic Recognition	Understand Counting	Strategies for mental computatios that reduce the need to count →							
Number Properties		Think addition for subtraction	Commutative, Associative, Odd/Even, Zero, Add to Subtract	Commutative, Inverse Operations	Property of One Property of Zero Distributive Property	Distributive Property		Divisibility		
Strategies Add & Subtract		Understand addition / subtraction	Mental Strategies: Facts to 20	Fluency	Strategies for mental computatios that reduce the need to count →					
			Mental Strategies: + - two digit number	Fluency	Strategies to 10 000; Decimals to .01ths	Add/Subtract Decimals			Fractions, Decimals,Integers	
Strategies Multiply & Divide				Understand multiply/divide	Mental Strategies- Facts to 9 x 9	Fluency	Factors, multiples, primes, composites		Square Roots	Non perfect squares
					Strategies 2/ 3 digit x one.	2 digit x 2 digit , 3 digit ÷ 1 digit	Multiply /Divide decimals	Multiply /Divide decimals	Multiply /Divide fractions, integers	Operations on Powers
						Interpret Remainders				
Rational Numbers				Fractions	Fractions	Equivalent fractions	Improper Fractions Mixed numbers	Add/Subtract		
					Relate fractions to decimals	Relate fractions to decimals		Relate terminating and repeating decimals to fractions		
							Ratio		Proportional Reasoning Ratio,Rate	
							Percent	Percent 1 - 100	Percent 0 - >100	
							Integers	Add/Subtract Integers		

Appendix A: Development Map K-9 Number, Measurement, Shape & Space

Evidence of Mathematical Reasoning
Match, Sort, Classify, Compare
Transform & Translate
Organize Data
Identify Patterns, Generalize, Conjecture
Plan, Test, Question
Justify, Verify, Convince, Refute
Provide Examples, Special Cases
Complete, Delete, Correct
Vary, Reverse, Alter
If…..Then

Metacognition Deliberate attempt to:
** Explain thinking
** Contrast thinking to others
** Adjust, adapt, refine thinking
** Apply strategy
** Shift strategy or approach
** Justify solution
** Question self
** Challenge self
Evaluate and regulate thinking

Specific Outcomes

BUILD	EXPLAIN	REPRESENT	COMPARE

Process Skills	
Visualization	
Communication	
Connections	
Reasoning	
MM /Estimation	
Problem Solving	
Technology	

Dispositions	
Curiosity	
Risk Taking	
Positive Attitude	
Perseverance	
Contributor	
Appreciation	

Students who receive specific feedback are able to assess themselves and set personal goals to improve

Appendix B: Example Framework for Implementing & Evaluating Problems

Starting Point	**1** ***Something on Paper***		
Communicated Thinking	***1*** ***Attempt to communicate thinking***	***2*** ***Mathematics is evident in communication***	***3*** ***Mathematical thinking is at grade level***
The Answer	***1*** ***Has an answer***	***2*** ***Mathematics is accurate***	***3*** ***Matches problem,evidence of check.***
Created/solved a similar problem	***1*** ***Wrote a problem***		

Starting Point	**1** ***Something on Paper***	**2** ***Information from problem is clearly evident***	**3** ***Mathematics evident and appropriate***
Communicated Thinking	***1*** ***Attempt to communicate thinking***	***2*** ***Mathematics is evident in communication***	***3*** ***Mathematical thinking is at grade level***
The Answer	***1*** ***Has an answer or explain why not***	***2*** ***Mathematics is accurate***	***3*** ***Matches problem, evidence of check.***
Similar Problem	***1*** ***Wrote a problem***	***2*** ***Mathematics is similar***	***3*** ***Solved using grade appropriate strategy***

Appendix C: Sample Rubric

Event Summary Senior High Implementation Supports 2009-2010 Appendix D			
Event Title	**Presenter**	**Location**	**Details**
Ready for Change: Senior High	Susan Ludwig	Peace River Grande Prairie	One day workshop: what's changed, focus on front matter.
Getting Ready to Change: Grade 9	Jackie Rakovic	Grande Prairie Peace River	Site based PD drew Grade 9 and 10 teachers unexpected response
Senior High Institutes: Focus on Teaching Through Problem Solving	Peter Liljehdal	Peace River Grande Prairie	January and June
Senior High Lead Teacher Cohort	Peter Liljehdal	Elluminate	Math 10C & 10-3 PD w/o Leaving Your Computer
Unit Planning for 10-C: Getting Ready to Teach	Rosalind Carson	Peace River	2 days back to back
Coaching for Change	Susan Ludwig Ralph Mason	Grande Prairie High Prairie	on demand, on site coaching day made available to Districts
Planning for Implementation Ten - C	Ralph Mason	Grande Prairie	face to face 2 full days Teacher Convention
Common Ten Unit Planning/Advisory	Susan Ludwig	VC 4 sites possible	4 part VC series UBD model to plan Linear Functions, and Trigonometry Units
Math 10C Lesson Analysis UBD	Joan Coy	4 SITES	One day face to face: Elluminate follow-ups
2010-2011 Senior High Implementation Support			
Building Common Assessments to Match the 10-C	Susan Ludwig	Fairview High (central locale)	4 days Face to face Minmimum 16 teachers (not met)
Open Mic on 10-3	Susan Ludwig	Elluminate	3 part series
How are You Assessing in 10-3	Susan Ludwig	Fairview High (central locale)	One day face to face
Senior High Institutes: Differentiating Instruction: Asking Good Questions	Marion Small	4 SITES	Technology mediated provincial day
Differentiating Instruction: Asking Good Questions	Marion Small	Elluminate	2 part series through ARPDC
Assessing What We Value	Peter Liljehdal	Grande Prairie	One day Face to Face Workshop 1/2 Day Presentation Teacher Convention
Math Curriculum Makeover: 9 to 12	Dan Myer	Elluminate	3 part series through ARPDC
Practical Ideas for Getting Ready to Teach Math 20-1, 20-2, 20-3	Steve Leinwand Mary Jo Rawleigh	Elluminate	2 Part series through ARPDC
Math 10C & 10-3 PD w/o Leaving Your Computer	Alberta Teachers	Techology Mediated	On line courses shared through ARPDC
Grade 9/10 Support As You Implement series	Jackie Ratkovic	Grande Prairie Peace River	Grade 9 & 10 teachers participated at both sites
Support for Planning in Preparation for 20-1, 20-2, 20-3	TBA	Grande Prairie Peace River	Currently Under Construction: Tentatively planned for June

Implementation Series for Grades 3,6,9. face to face workshops

Appendix E

Grade 3 Support As You Implement Series

With the KEY ideas from Number, Measurement and Space and Shape in mind, we will use the BERCS model:Build, Explain, Represent, Compare to collaboratively plan, implement and evaluate rich connected activites. Bring back student work in order to build a common vision for grade level

Grade 3 Facilitated by: Jennifer Koganow (2nd Chair: Geri Lorway)

Session One
Peace River Tues Oct 5
Grande Prairie Tues Oct 19

Session Two
Peace River Tues Dec 7
Grande Prairie Wed Jan 12

Session Three
Peace River Wed March 23
Grande Prairie Wed April 6

Grade 6 Support As You Implement Series

With the KEY ideas from Number, Measurement and Space and Shape in mind, we will use the BERCS model:Build, Explain, Represent, Compare to collaboratively plan, implement and evaluate rich connected activites. Bring back student work in order to build a common vision for grade level

Grade 6 Facilitated by: Tracie Anthony (2nd Chair: Geri Lorway)

Session One
Peace River: Thurs. Oct 7
Grande Prairie: Wed. Oct 20

Session Two
Peace River: Fri. Dec 3
Grande Prairie: Thurs. Jan 13

Session Three
Peace River: Tues March 22
Grande Prairie: Thurs April 7

Grade 9 Support As You Implement Series

Each day will focus on specific key outcomes for Grade 9. How do we plan to integrate process and skills, what do we expect to see as evidence of numbers sense and problem solving ability, how do we differentiate to include all learners in the content. the focus is support as you implement. What are you doing in your classroom and how are your students progressing?

Grade 9 Facilitated by: Jackie Ratkovic

Session One
High Prairie: Mon Sept 27
Peace River: Mon Sept 13
Grande Prairie: Thurs Sept 30
Elluminate: Oct 20: 3:45 to 5:15

Session 2
Peace River: Tues Nov 2
High Prairie: Mon Nov 1
Grande Prairie: Wed Nov 3
Elluminate: Nov 17: 3:45 to 5:15

Session 3
High Prairie: Tues Dec 7
Peace River: Mon Dec 6
Grande Prairie: Wed Dec 8
Elluminate: Jan 12: 3:45 to 5:15

Other Offerings for Mathematics 2010-2011

Grade 7 Support As You Implement Series

We will focus on approaches that promote student understanding, observe in a classroom & collaborate on building some lessons and assessments. If you know this curriculum you will enjoy the chance to share what worked and troubleshoot what hasn't. If you are "new" to this curriculum you will appreciate not having to start from scratch in your planning and assessing.

Grade 7 Facilitated by: Jackie Ratkovic

Session One
High Prairie: Tues Sept 28
Grande Prairie: Tues Oct 12
Elluminate: Wed Oct 27
3:45 to 5:15

Session Two
Grande Prairie: Mon Jan 17
High Prairie: Tues Jan 18
Elluminate: Wed Mar 2
3:45 to 5:15

Grade 8 Support As You Implement Series

We will focus on approaches that promote student understanding, observe in a classroom & collaborate on building some lessons and assessments. If you know this curriculum you will enjoy the chance to share what worked and troubleshoot what hasn't. If you are "new" to this curriculum you will appreciate not having to start from scratch in your planning and assessing.

Grade 8 Facilitated by: Jackie Ratkovic

Session One
High Prairie: Wed Sept 29
Grande Prairie: Wed Oct 13
Elluminate:
Thur Oct 28: 3:45 to 5:15

Session Two
High Prairie: Wed Jan 19
Grande Prairie: Thurs Jan. 20
Elluminate
Thurs Mar 3: 3:45 to 5:15

Register on line at: www. nrlc.net Questions/Concerns/Confusions call Geri 780 826 1495 glorway@telusplanet.net

Elementary Math Leadership Cohort: Oct 13 Nov 25 Jan 20 April 27 *Invitation Only*
Junior High Math Leadership Cohort: Sept 14 Nov 9 Jan 21 May 5 *Invitation Only*

These two cross-jurisdictional groups are working ona K to 9 mapping project to build integrated planning and assessment pieces to support colleagues. BERCS and COPES are the frameworks that allow us to include disposition, process skills and mathematical reasoning when planning for and building assessment approaches that focus on understanding in mathematics.

A Professional Conversation Series based on the book: The Man Who Counted

"There was something about the story that made me not want to stop reading. You begin to wonder if Beremiz will ever be presented with a problem that he can't solve. This book illustrates how important math is."

The story is told in the style of classic Arabian fables like the 1,001 Nights-- a style that makes for easy reading and keeps the material very approachable. It is a delightful book in which each chapter unveils a fascinating piece of math. Woven within the book are themes that sample from important ideas about number and number sense. Each month we will discuss one chapter with the aim to develop tasks that can be linked to your classroom. The stories emphasize conceptual understanding, mathematical reasoning, and the importance of developing flexible thinking and mental fluency, as well as the habits of mind that lead to mathematical confidence. Participants will deepen their understandings of the history of mathematical ideas as they come to understand the big ideas of mathematical thinking in a whole new light.
These stories truly illuminate real life applications for mathematics.

Teachers from grade 1 to 12 are invited to participate. All Sessions are Elluminate 4:00 till 5:30 p.m.

Tuesday September 28 Tuesday Nov 2 Tuesday Dec. 7
Tuesday Jan 11 Tuesday Feb 8 Tuesday March 8 Tuesday April 5

Please register early so as to receive your copy of the book in time.
Elluminate sessions will run 4 – 5:30 p.m. The link will be emailed to you after you register at www.nrlc.net

Monday October 4 Grade 4: Multiplication with Meaning

This full day workshop will focus on developing with multiplication and division from understanding to strategies to fluency. We will build materials, tools, practise pages and problems that provide the range of focused activities needed if students are going to build a rich and connected understanding of multiplication and division and how they link to place value and decimal notation. Focus your year, focus your teaching.... multiplication with meaning.

Grande Prairie Coca Cola Center

Watch for a REPEAT session in Peace River
Watch for follow up session TBA

Conversation Evening Groups: Building Better Problems
The dinners will focus on building, teaching with and assessing student success through problems. participants will work collaboratively in grade level groups to produce problems, analyze student work and consider tools for assessment. You registration includes dinner and a book.

Grande Prairie:
Sept 20 Oct 25 Nov 29 Jan 10 Feb 28 April 11 May 30

March 9 (all cohorts are invited to special dinner before convention)

Peace River
Nov 18 Jan 13 May 2

Blending the Big Ideas: **K to 3 in the Revised Curriculum**

Does your primary classroom operate as a mathematical community?

Are your young students engaged in problem solving tasks that allow them to build, apply and refine their number sense and thinking skills? Looking for a place to collaborate with colleagues as you develop techniques for teaching through problem solving?

This Elluminate series will challenge you to focus on the Big Ideas kids need to know to be successful mathematical learners. We'll explore Number, Measurement and Shape & Space. Come prepared to listen, learn, collaborate, plan, build and reflect on activities that develop thinking and problem solving skills. You will need your long-range plans and curriculum documents for each session.

Tuesday Oct 5 **Tuesday Nov 23** **Tuesday Jan 18** **Tuesday Feb 15**

Facilitated by April Brown

Provincial Assessment for the Revised Grade 3 Mathematics

Grande Prairie

½ day workshops

December 9

9 to 12:00 Face to Face 1 to 3:30: VC

This half-day session will provide teachers with information about the design and development of the new Mathematics 3 Provincial Achievement Test, which is based on the revised mathematics curriculum. The focus of the new PAT as well as the kinds of questions that will be used to assess students' learning will be discussed. Teachers will have the opportunity to ask questions and to clarify their understanding of the PAT assessment process in mathematics.

This session will be repeated in the afternoon via videoconference

Deanna Wiens is currently the Grade Three Examination Manager for Mathematics and English Language Arts.

Provincial Assessment for the Revised Grade 6 Mathematics

Grande Prairie

November 29 ***½ day workshops***

9 to 12:00 Face to Face 1 to 3:30: VC

Provincial Assessment for the Revised Grade 9 Mathematics

November 30

9 to 12:00 Face to Face 1 to 3:30: VC

ABOUT THIS LEARNING OPPORTUNITY

This half day session will primarily focus on the process that was used to develop the new test specifications for the 2011 Mathematics 9 Provincial Achievement Tests. Participants will also have an opportunity to engage in various activities that were used to create the test specifications, including item review and item development. Please bring the full Program of Studies with the Achievement Indicators.

Kelly Rota is currently the Alberta Education Mathematics 6 and 9 Exam Manager.

Blending the Big Ideas: Multiplication and Division in the Revised Curriculum

What are you teaching and why? **Grades 4 to 7**

Now that we are fully immersed in the revised curriculum do you understand the strategies your students should be building, practicing and perfecting in order to develop fluency with multiplication and division? This 4 part series will focus on tools and models that promote conceptual understanding. From single facts to "long division" with remainders, we will run the gamut to decimals and fractions.

Each session you will be challenged to try something in your classroom and bring back the results. Engage all your students with strategies that allow them to learn their "facts' in ways that develop fluency and confidence with practice that is **meaningful and mathematical.**

Wednesday Oct 13 **Wednesday Nov 3** **Wednesday Nov 24**

Facilitated by Geri Lorway

Blending the Big Ideas: Decimals and Fractions in the Revised Curriculum

What are you teaching and why? **Grades 4 to 7**

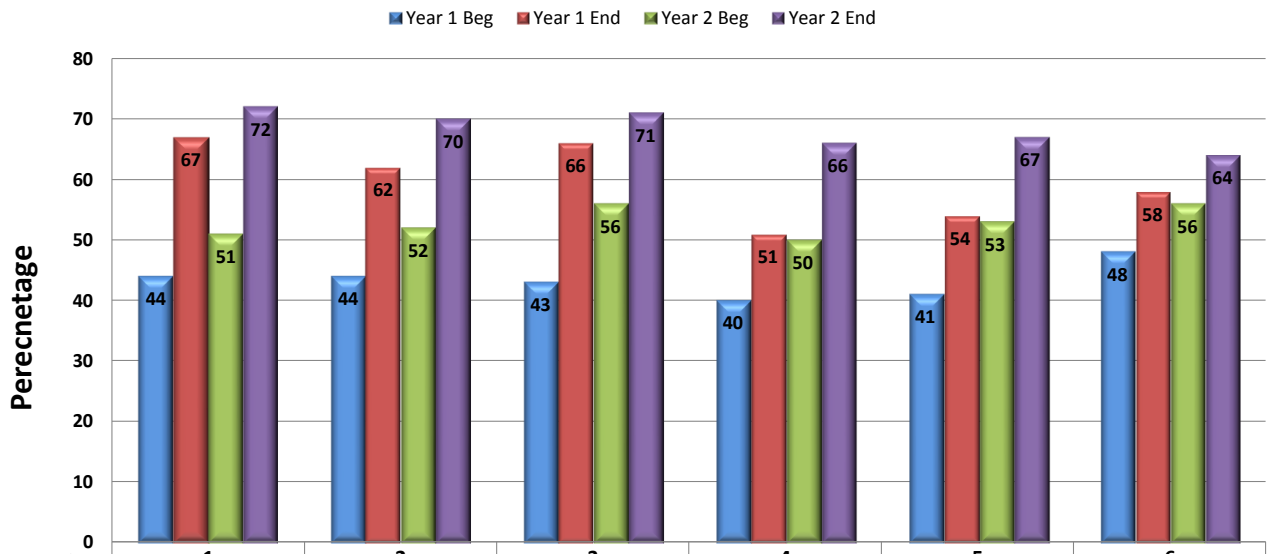
In order to experience success in junior high our students must develop a deep and connected understanding of the link between multiplication, division, place value, fractions and decimal fractions. During these four sessions we will sample a variety of tools and models that help students build conceptual understanding in ways that promote and extend their number sense to build confidence and fluency with solving problems that include decimals and fractions.

While participating in the Multiplication series is advisable it is not a pre requisite.

Wednesday Jan 5 **Wednesday Jan 26** **Wednesday Feb 16** **Wednesday Mar 16**

Facilitated by Geri Lorway

Appendix F



Grade	1	2	3	4	5	6
Year 1 Beg	44	44	43	40	41	48
Year 1 End	67	62	66	51	54	58
Year 2 Beg	51	52	56	50	53	56
Year 2 End	72	70	71	66	67	64