2016-2017 Northwest Regional Learning Consortium (NRLC)

(Combined) Annual Report and Curriculum Implementation Final Report

Submitted December 2017

Northwest Regional Learning Consortium is one of seven regional consortia in Alberta established to support regional professional development needs in an ongoing, coordinated and cost effective manner.

NRLC has a NEW Website!

We are pleased to have launched a new website in 2016/17 with improved functionality and graphic design elements. Other improvements include a PD Calendar, Trending page (featuring latest news and info), a Learning Room (under construction with educator resources and links) and PD Request link. https://www.nrlc.net/

Fall 2017 Announcements…

A NEW Office!
10127 – 120 Avenue, Grande Prairie, AB T8V 8H8

NEW Executive Director!
Sandra Ciurysek sandra.ciurysek@gppsd.ab.ca

Congratulations on retirement of *Karen Egge, Executive Director at NRLC for 20 years!*

Northwest Regional Learning Consortium
10127-120 Avenue
Grande Prairie, AB T8V 8H8
Karen Egge, Executive Director [Aug.2017-Oct.2017]
Sandra Ciurysek, Executive Director

info@nrlc.net
www.nrlc.net
sandra.ciurysek@gppsd.ab.ca

Twitter: NRLC Info
Facebook: https://www.facebook.com/nrlc.net

Appendices

ARPDC Beliefs About Curriculum Development

ALBERTA EDUCATION VISION STATEMENT

"The best Kindergarten to Grade 12 education system in the world."

ARPDC (Alberta Regional Professional Development Consortia) is a collective group comprised of seven regional consortia across the province of Alberta, including:

- Northwest Regional Learning Consortium (NRLC)
- Learning Network Educational Services (LN)
- Edmonton Regional Learning Consortium (ERLC)
- Central Alberta Regional Consortium (CARC)
- Calgary Regional Consortium (CRC)
- Consortium provincial francophone pour le perfectionnement professionnel (CPFPP)
- Southern Alberta Professional Development Consortium (SAPDC)

Overarching Understanding

Effective curriculum implementation leads to a change in practice that enhances student learning.

Our pillars

- Effective Collaboration(process)
- Effective Practice (content)
- Effective Adult Learning (context)

Enduring Understandings

We have come to understand:

- Effective curriculum implementation is a shared responsibility for all stakeholders.
- Effective curriculum implementation is developmental and contextual.
- Effective curriculum implementation must be systemic, systematically planned and sustained.
- Collaboration leads to deeper understanding and shared commitment.
- PD is interactive, continuous and reflective.
- Effective adult learning is meaningful, purposeful and provided through a variety of learning opportunities for all stakeholders.

Essential Questions

- What does shared responsibility of all stakeholders look like?
- What are the measures of effective implementation?
- What strategies lead to change in professional practice for enhanced student learning?
- How do you address the developmental and contextual variables of communities to achieve effective implementation?
- What does meaningful and purposeful stakeholder collaboration look like?

Messages

Accountability Statement

The Northwest Regional Learning Consortium Annual Report for the 2016-2017 year was prepared under the direction of the Management Team of the Northwest Regional Learning Consortium and in accordance with the reporting requirements provided by Alberta Education; with financial guidance and oversight by the NRLC agent board, Grande Prairie Public School District #2357.

The results of this report are used, to the best of NRLC's ability, to advocate for quality professional development; and from the point of view of the service provider to work with its partners to develop, implement and assess professional development programs and comprehensive plans that support learning for students' sake. The 2016-17 Financial Statement is submitted as Appendix A to this report.

Nick Radujko
Board Chair

Karen Egge
Executive Director

Message from the Management Team Chair

The Northwest Regional Learning Consortium (NRLC) continues to serve the professional learning needs of its stakeholder groups in Northwestern Alberta. Our goal is to provide a high quality of relevant, professional learning opportunities to administrators, teachers, support staff, paraprofessionals, and parents in support of the provincial and district goals and expectations. The consortium serves the professional learning needs for 9 northern districts and their thousands of staff. Our services addressed the needs of over 9,000 participants in the last year. Their participation indicates the need for these services to continue to be locally brokered to assist the unique professional needs found in northern Alberta.

We could not do our work without the partnerships we have on the Management Team. We have representatives from the College of Alberta School Superintendents (CASS); Alberta Teachers' Association (ATA), Association of School Business Officials (ASBOA); Alberta School Boards Association (ASBA) through an area Trustee; and, the Teacher Education North Program at Grande Prairie Regional College.

Without this collaborative team, the professional discussions that assist in crafting the menu of opportunities in our area would not be as complete nor as impactful as they are today. The learning consortium continues to be a vibrant part of professional learning in the north while addressing the needs of everyone using a variety of approaches from face to face opportunities to web based learning opportunities.

As this year fades, we look forward to continuing our work in the future in the furtherance of our mission to fulfill the professional learning needs of our 9 school districts and the many communities those districts serve. I would add that it is with regret we note that Karen Egge, who has been the Executive Director for twenty years, is taking a well-earned retirement. So by the time you read this will have been replaced by Sandra Ciurysek. We all wish Karen the very best with a hearty thanks for the years of dedicated service.

Respectfully Submitted, Nick Radujko, Board Chair, Zone 1 College of Alberta School Superintendents (CASS)

MESSAGE FROM THE EXECUTIVE DIRECTOR

Submitted by: Karen Egge, Executive Director

We are pleased to present the 2016-2017 Combined Curriculum Implementation and Annual Report. We celebrate *"20 years of Professional Learning"* with the members of Zone 1 and the NRLC team working hard to meet the learning needs of our education partners through collaboration and comprehensive planning. This report provides a record of the learning opportunities completed, the collaborative projects shared throughout the Zone, and comprehensive reporting on how we met the priorities and deliverables of the Curriculum Implementation grant allocation for our service area.

We completed an extensive needs assessment in 2016-2017 with requests to continue curriculum program support in Mathematics (34.1%), Inclusive Education (33.3%) and English Language Arts (31.8%). These priorities align with the Curriculum Implementation grant and *"The Guiding Framework for the Design and Development of Kindergarten to Grade 12 Provincial Curriculum".* The draft Scope and Sequence of the 6 subjects was shared for feedback in May/June, 2017 and was of great interest to everyone.

These topics, along with stakeholder jurisdictions Three (3) Year Education Plans, Education for Reconciliation actions flowing from the Truth and Reconciliation Commission report, and the 2016 draft Teacher and Leadership Quality Standards will impact our future work. We welcome every opportunity, whether a one day workshop, multi-day conference, or district PD day, to work collaboratively through effective professional learning design and innovation.

Teachers and support staff requested professional learning support in relation to supporting student needs in the classroom through:
** Managing Difficult Behaviors (69.8%)*
** Helping students with Self- Regulation Issues (47.3%)*
** Supporting students with Mental Health Issues (39.5%)*

We value the on-going dialogue with district personnel, advisory groups, Alberta Education, and all our partners as we keep the focus on promoting learning that goes deeper, builds local capacity and leverages promising teacher practice for student learning. As I reflect on my time as Executive Director I recognize the increased complexity of education services and the need to focus on continuous improvement and life-long learning. In preparing for implementation of the new curriculum in the next few years I know the voices from the classroom will be heard and I am so proud of the education system I have been part of for the past 20 years as a professional learning provider working together for "*Adult Learning for Student's Sake".*

Tammie Diesel and Jenn Labrecque continue to provide exemplary support for the operations of NRLC and I offer my most sincere thanks to them as they grow in their knowledge and how best to be responsive and consistent with the high level of services we provide. I value the consultants we work with over an extended period of time and thank them.

I am confident in transitioning to the new Executive Director Sandra Ciurysek as we share the same passion for learning and she brings a wealth of experience and knowledge to the position. It has been a privilege to provide education services to our wonderful North Country and I will always be an ambassador to this important work.

Introductions: Who We Are in the North

The Northwest Regional Learning Consortium is governed by educational stakeholders and is represented by the following associations:

Board of Directors

Adele Loewen	Alberta Teachers' Association (Peace Wapiti SD)
Wendy Kelm	Alberta School Boards Association (Peace Wapiti SD)
Raymonde Lussier	Association of School Business Officials of Alberta (High Prairie SD)
Ray Sylvester	Alberta Teachers' Association (Grande Prairie Public SD)
Mark Yurick	Alberta Teachers' Association
Nick Radujko (Chair)	College of Alberta School Superintendents (Grande Prairie Public SD)
Jean Reston	Teacher Education North, GPRC
David Harvey	Alberta Education, Education Manager School Improvement
No Representative	Alberta School Councils' Association

Staff and Consultants 2016 - 2017

Karen Egge	Executive Director
Tammie Diesel	Systems Coordinator/Executive Assistant
Jennifer Labrecque	Administrative Assistant
Joanne Bardak	Curriculum Facilitator
Geri Lorway	Mathematics Curriculum Consultant

Northwest Regional Learning Consortium is proud to work with and serve the following jurisdictions as well as private, charter, and First Nations Schools in our region.

Districts

Fort Vermilion School Division No. 52	www.fvsd.ab.ca
Grande Prairie RCSSD No. 28	www.gpcsd.ca
Grande Prairie Public School District No. 2357	www.gppsd.ab.ca
High Prairie School Division No. 48	www.hpsd.ca
Northern Gateway Regional Division Valleyview Area	www.ngps.ca
Holy Family Catholic Regional Division No. 37	www.hfcrd.ab.ca
Peace River School Division No. 10	www.prsd.ab.ca
Peace Wapiti School Division No. 76	www.pwsd76.ab.ca
Northland School Division No. 61	www.nsd61.ca

NRLC Mission, Vision and Regional Context

Mission

Northwest Regional Learning Consortium (NRLC) provides quality professional development that is responsive to its learning community members' needs as they work to enhance student learning.

Vision

The NRLC serves as a catalyst to inspire and enhance active adult engagement in the overall learning process that in turn supports, enriches and improves student learning. The essential work of the Consortium is aligned with provincial priorities, regional needs, and district and school goals so that sustainable, meaningful learning opportunities are available to its learning community members. The Consortium promotes learning and learning connections for the diverse community of adults who share the responsibility for student learning.

Regional Context

In the 2016-2017 school year, NRLC operated with one Executive Director and two administrative support positions for the purpose of representing both the regional jurisdiction and provincial partners, meeting grant deliverables as identified through provincial grants. Additionally, Joanne Bardak acted as a full-time Curriculum Facilitator and Geri Lorway was contracted as a part time (.25) Mathematics Curriculum Consultant. NRLC connected with four Advisory Committees, nine Regional Planning Teams, as well as with numerous contacts from the ten school jurisdictions and regional private and band schools.

- The Northwest Regional Learning Consortium provides services and learning opportunities for nine school jurisdictions with over 197 schools, including private, charter, and First Nation Schools, in a large geographical area covering the northern half of Alberta. Approximately 2100 FTE teachers are employed within these school authorities in various subject and grade configurations, serving well over 38,000 students.
- Three jurisdictions with almost half of all of the teachers are located within one small urban center (Grande Prairie) served by this consortium. These same jurisdictions also serve 45% of all students in the Zone.
- The majority of jurisdictions have a high percentage of FNMI students; some include Colony schools and/or French Immersion schools. There are many small schools, multi-grade configurations and staff teaching multiple subjects in the smaller schools. Availability and cost for substitute teachers and competing priorities for PD funding remain a challenge for teachers and districts.
- Distance and scattered locations within the region provides a challenge in providing professional development learning opportunities for teachers within the region. As a result, NRLC continues to provide programming wherever feasible in each district or community. We use a variety of locations, thereby reducing travel time for participants to attend sessions. Distributed learning/online professional development plays an integral role in the overall planning, also reducing time and travel commitments.
- NRLC services and professional learning opportunities include activities that individuals undertake to develop skills and knowledge, and to enhance practice and growth. Opportunities and supports for learning are provided in many ways including face-to-face sessions, such as workshops and presentations; courses and qualification programs; technology-based learning opportunities, such as webinars; job-

embedded professional learning, such as mentoring, collaborative planning and learning communities; material development; and professional development resources available on the NRLC and ARPDC websites.

- A number of on-going initiatives (i.e. zone advisory committees, curriculum coordinator meetings, individual and joint planning meetings with districts) across the region provide opportunities for working together and designing plans that can complement and enrich teacher learning.

Over the past few years, our consortium work and planning has been fine tuned in response to building our knowledge of effective professional development design that meets our regional environment, and meeting the expectations of Alberta Education and School Jurisdiction Business Plans. Tools developed by Alberta Education in conjunction with the ARPDC leadership and other stakeholders include the Guide to Comprehensive PD Planning and the Essential Conditions Guide to Support implementation. This past year, with the continued focus on student learning, we have worked closely with several key regional planning teams as well as provincial teams to develop those snapshots of effective student learning.

Information provided to ARPDC Executive Directors by Alberta Education Lead Managers and Directors was utilized in the development of program implementation plans and supports. Conversations and planning meetings provincially and regionally have enabled NRLC to develop plans to coordinate with and complement the work of school districts in the region effectively with resources provided through conditional and pilot grants and sharing of regional expertise and lessons learned.

In the 2016-2017 year, the Curriculum Coordinator meetings had extended time and invitations for dialogue on awareness of Curriculum Design and other initiatives. Our thanks to the Alberta Education team who participated across the province.

It should be noted that NRLC staff and consultants including Karen Egge, Joanne Bardak, and Geri Lorway often held individual meetings to refine professional development programs and or design specific sessions based on district requests. We continually search for ways to be most cost effective, using the combination of some grant dollars from the annual implementation grant and funding from district resources continue to make professional development accessible and job-embedded.

Working in Collaboration with Regional and Provincial Partners

Consortia Partnerships

Alberta Regional Professional Development Consortia (ARPDC)

The ARPDC are dedicated to promoting student learning and achievement; school improvement; and parental engagement in the educational process through the provision of effective professional development services, at the local, regional and provincial levels.

NRLC Advisory Committees

To ensure the needs of school districts, charter, private and band schools are met, Northwest Regional Learning Consortium collaborates by forming advisory committees which represent stakeholder groups. Advisory committees address the following Alberta Regional Professional Development Consortia goals:

- ✓ Facilitate professional development which supports the effective implementation of the Alberta Education Business Plan and jurisdictional and school council education plans.
- ✓ Facilitate professional development which supports the effective implementation of curricula, including instruction, assessment and student learning outcomes.
- ✓ Promote and support the development of professional development leadership capacity.
- ✓ Deliver professional development based on the identified and emerging needs of education stakeholders.

Curriculum Coordinators

Sheldon Rowe, Superintendent	Peace Wapiti School Division
Heather Putio, Assistant Superintendent	Peace Wapiti School Division
Bob Stewart, Deputy Superintendent	Peace Wapiti School Division
Paul Bennett, Superintendent	Peace River School Division
Karen Penney, Deputy Superintendent	Peace River School Division
Alexander (Sandy) McDonald, Superintendent	Grande Prairie Public School District
Nick Radujko, Assistant Superintendent, Curriculum Services	Grande Prairie Public School District
Karl Germann, Superintendent	Grande Prairie & District Catholic Schools
Jessie Shirley, Assistant Superintendent of Teaching & Learning	Grande Prairie & District Catholic Schools
Betty Turpin, Superintendent	Holy Family Catholic Regional Division
Cora Ostermeier, Assistant Superintendent	Holy Family Catholic Regional Division
Roger Clarke, Superintendent	Holy Family Catholic Regional Division
Mike McMann, Assistant Superintendent of Teaching and Learning	Ft Vermilion School Division
Kathryn Kirby, Assistant Superintendent of Inclusive Education	Ft Vermilion School Division
Laura Poloz, Superintendent	High Prairie School Division
Margaret Hartman, Deputy Superintendent	High Prairie School Division
Treva Emter, Assistant Superintendent of Curriculum	High Prairie School Division
Gord Atkinson, Superintendent	Northland School Division
Don Tessier, Associate Superintendent	Northland School Division
Lorraine Cardinal-Roy	Northland School Division
Brigette Kropielnicki, Superintendent	Conseil scolaire du Nord-Ouest

Inclusive Education Advisory Committee

Karen Chrenek	Peace Wapiti School Division
Stephanie Ritchie	Northland School Division
Margaret Hartman	High Prairie School Division
Pauline Ruel-Wyant	Grande Prairie & District Catholic Schools
Chris Farquharson	Grande Prairie Public School District
Jim Taplin	Holy Family Catholic Regional Division
Kathryn Kirby	Ft Vermilion School Division

First Nations, Métis, and Inuit Advisory Committee

Darrell Willier	Peace Wapiti School Division
Lorraine Cardinal Roy	Northland School Division
Delores Cox	High Prairie School Division
Tina McDonald	Grande Prairie & District Catholic Schools
Shannon Dunfield	Grande Prairie Public School District
Mike McMann	Ft. Vermilion School Division
Jim Taplin	Holy Family Catholic Regional School District
Holly Crompton	Peace River School District #10
Terry Lynn Cook	ATA Walking Together Consultant
Etienna Moostoos-Lafferty	ATA Walking Together Consultant

Collaboration! We welcomed two ATA Walking Together Consultants to our renewed Zone 1 FNMI Advisory meetings in the 2016/17 year. We agreed to combine their need for an advisory group and the NRLC FNMI Advisory Zone 1 into one group. The group was also expanded to add GPRC, Northern Lakes College representatives, and First Nations community representatives.

French Language Advisory Committee

The *French Language Resource* Centre representing thirteen partners including seven school boards:

Grande Prairie Public School Division
Peace Wapiti School Division
Grande Prairie and District Catholic Schools
Peace River School Division
Conseil scolaire du Nord-Ouest
Holy Family Catholic Regional Division
High Prairie School Division
Académie of Nancy-Metz

SAMPLE RESPONSES from *French* sessions

- ✓ I am the only French Immersion teacher in my grade level within my school board. This was a great opportunity to raise awareness of the different approaches and programs that we are using in the classroom.
- ✓ What a great opportunity to "play" and apply new learning technologies to support FSL teaching.
- ✓ Connecting theory and practice was a powerful way to reflect on my skills, and understand the multiple possibilities are out there when teaching grammar in context.
- ✓ Very hands on; allowed us to look at difference resources. Included a good mix of French and English.

One thing I require to further support my professional learning on this topic is:

- ✓ Greater opportunities at the school level to discuss and plan in an integrated way
- ✓ Nothing from NRLC, just school-based support

An aspect that might be improved:

- ✓ Too bad other teachers missed because they had a shortage of subs.
- ✓ More than 3 times per school year, perhaps 6 times per school year but only half days. LESS THEORY (we've heard it all..) and more time to look at resources and work with other teachers

SAMPLE RESPONSES from *Inclusive Education* sessions

An aspect of this learning opportunity that made it meaningful is:

- ✓ I'm so glad to know the resources and materials are (so clearly) laid out for/created for teachers so that I don't need to reinvent the wheel for the teachers I work with.
- ✓ Thank you so much for this wealth of resources!
- ✓ Relates to so many of my students. Very well organized and research based. Resources provided will be useful. Really good that my EA could also be present.
- ✓ Very useful and practical applications to the use of the WJIV. The instructor was very knowledgeable and provided exactly what I expected from this PD.
- ✓ The sharing of the website and concrete information on how we can actually teach errorless learning. It was also great to have the opportunity to practice the steps with the people at our tables.
- ✓ We were taught the basics of knowing how to extend the basics to go further. The info we were taught will help me begin to communicate with students who are deaf or partially hearing impaired. This was a very hands on course.
- ✓ My child has ADHD. This was so enlightening. I get it. No more "why" questions.
- ✓ I left the session understanding how the whole school and district benefits from collaborative work on this topic.

One thing I require to further support my professional learning on this topic is:

- ✓ More supports from the teacher and admin
- ✓ How to help teachers in the classroom better understand this concept and how to approach parents with asking the right type of questions to find out if some of this deregulation of students is based on brain development from early age experiences. So having those "tough" conversations

An aspect that might be improved:

- ✓ More engaging activities and examples/suggestions that are applicable to high school environments
- ✓ More opportunities to move and collaborate among participants

Regional Collaborative Learning Teams

Regional Planning Teams collaborated to encourage and maintain professional learning projects and relationships across the region. Some of these projects and teams have been established for a number of years, based on branching out from district and advisory committee work.

Grande Prairie Public School District

- Nick Radujko
- James Robinson
- Shannon Dunfield
- Chris Farquharson

Greater Peace ATA Local 13

- Wanda Laurin
- Kathy Gall

Mighty Peace Teacher Convention

- Jodi Dell
- Julie Gummesen

Holy Family Catholic School Division

- Betty Turpin
- Jim Taplin
- Cora Ostermeier

North Zone EA Conference Team

- Chris Farquharson, GPPSD
- Karen Chrenek, PWSD

Fort Vermilion School Division

- Kathryn Kirby
- Michael McMann

Northland School Division

- Gord Atkinson
- Don Tessier
- Janette Cavanagh
- Lorraine Cardinal-Roy

Peace River School Division

- Karen Penney
- Janet Wallentiny
- Janet Mayer
- Deborah Martin

Peace Wapiti School Division

- Sheldon Rowe
- Bob Stewart
- Darren Young
- Heather Putio
- Karen Chrenek

Early Learning Collaborative Project

- Elizabeth Bell
- Marilyn Boisvert
- Meranda Ekins

Northern Alberta Family Literacy Regional Network
Supports to Early Learning and Child Care Programs
South Peace Area Rural Kids Early Development

SAMPLE RESPONSES from *Leadership* sessions

An aspect of this learning opportunity that made it meaningful is:

✓ Collaborative opportunity with other professionals in the community. It helped to get people on the same page about protocols in the Grande Prairie area.

✓ It was highly applicable and practical. I felt like I could follow it well and could connect it to both current and future/desired practice.

One thing I require to further support my professional learning on this topic is:

✓ It was a presentation that reaffirmed my belief that we are on the right track when recruiting new staff members.

✓ I liked how things ended and wish I could have more time to spend on that kind of reflection and planning of how to start the PLCs, but once they get started, they will provide that kind of time themselves.

Curricular Areas of Priority 2016-2017

Northwest Regional Learning Consortium plans learning opportunities based on direction from Alberta Education as outlined in grant deliverables and on advice from our region including feedback from advisory committees, district curriculum coordinators, district instructional leaders, district coaches, regional planning teams, session participants, the NRLC Management Team, and other education stakeholders. We strive to collaborate with as many groups as possible to support "Adult Learning for Students' Sake".

The ***Northwest Regional Learning Consortium Regional Plan to Support Curriculum 2016-2017*** was developed and the following priorities were identified:

1. **First Nations, Métis, and Inuit:** Support for all levels of school authorities that results in an increased awareness and understanding of First Nations, Métis and Inuit histories, perspectives, and ways of knowing for the purpose of implementing treaty and residential schools education and Truth and Reconciliation Commission calls to action for education, and commitments related to the United Nations Declaration on the Rights of Indigenous Peoples.

2. **Mathematics:** Support for:
   - Kindergarten to grade 12 teachers in helping students develop higher-order thinking skills, (i.e.: reasoning and problem solving).
   - Building awareness and understanding of revised learning outcomes and achievement indicators for grades 1-9 for September 2016 implementation.
   - Grade 6 teachers to build awareness and understanding of the Grade 6 Mathematics PAT Part A that is being added starting the 2016-17 school year on number operations that students will complete without the assistance of calculators.
   - Grade 12 teachers to build awareness and understanding of the expectations of the program of studies and the assessment standards for Math 30-1 and for Math 30-2.

3. **Supporting Competencies in Current Curriculum:** Support for all levels of school authorities for the implementation of the streamlined competencies and revised draft competency indicators in current programs of study by developing an awareness and understanding of how competencies and competency indicators support learning outcomes for student-centered, competency-focused learning

4. **Supporting Literacy and Numeracy in Current Curriculum:** Support for all levels of school authorities in continuing to build awareness and understanding of literacy and numeracy. Support for all levels of school authorities in building their awareness of literacy and numeracy in existing programs of study. When the Literacy and Numeracy Progressions are released, build understanding of the Progressions and the ways that they support teachers and students.

5. **Provincial Assessment - Student Learning Assessments:** Support for 20 school authorities (provincially) participating in Year 3 pilot sample in:
   - building their awareness and understanding for the implementation of Student Learning Assessments
   - building their awareness and understanding of ways to effectively train teachers to locally assess the SLA Performance Tasks
     - providing training and support materials
     - supporting the planning of collaborative marking sessions
   - building their awareness and understanding for:
     - interpreting and sharing information in the reports (individual student report and class report) that are based on the Student Learning Assessment digital interactive questions
     - interpreting and sharing the results from the locally assessed Student Learning Assessment Performance Tasks

- assisting with the development of supports, based on information from the SLAs, that can be used to enhance classroom instruction

Help teachers build their understanding of student learning through the use of interpreting the results of provincial assessments.

6. **Provincial Assessment – Diploma Programs:** Support for:
   - all levels of school authorities in professional learning supports for interpreting results
   - grade 12 teachers to build awareness and understanding of the expectations of the program of studies and the related assessment standards for subject-specific diploma exams

7. **Inclusive Education (including ESL, Early Learning, and Leadership Capacity Education):**
   - Support all levels of school authorities to build capacity for facilitating and implementing best practices in inclusive education to ensure success for all students.
   - Support for all levels of school authorities in developing increased awareness and understanding needed to implement flexible and responsive learning experiences that acknowledge every students' individual learning needs.

8. **Career & Technology Foundations:** Support the September 2016 implementation of the Career and Technology Foundations Program of Studies by:
   - Working with school authorities to provide the support, understanding and awareness required for successful implementation.
   - Supporting the agile development of a CTF digital curriculum.
   - Sharing success stories across the province, such as school visits to see CTF in action.

9. **Learning Commons Policy:**
   - Support for all levels of school authorities that result in an increased awareness and understanding of the Learning Commons Policy.
   - Support at all levels of school authorities for the implementation of the Learning Commons Policy.

10. **Curriculum Development:** Support curriculum development within the ministry's priority of curriculum renewal by:
    - Organizing and leading sessions with education stakeholders to support them in responding to Alberta Education's online surveys about provincial curriculum that will inform the development of future curriculum.
    - Organizing and leading sessions with education stakeholders to support the validation of draft kindergarten to grade 12 subject introductions and scope and sequences in six subjects

11. **Other Regional and Provincial Priorities**: Professional learning support identified as a need by regional consortia or Alberta Education in topics or subjects that are not listed above, provided that this support strengthens the application of the priorities identified in previous years' grants.
    - Technology, Leadership, Mental Health, Non-Violet Crisis Intervention, Other

Regional Plan to Support Curriculum Implementation Summary

The 2016-17 Curriculum Grant provided the base of our operations in developing and delivering the learning activities for our Zone 1 school jurisdictions and educators. Highlights of this work and outcomes are included in this report; along with particular notes of our expanding partner projects.

The 2016-2017 Regional Plan includes support for quality professional learning opportunities for all educators related to the provincial priorities in the areas of:

- First Nations, Métis and Inuit
- Mathematics
- Supporting Competencies in Current Curriculum
- Supporting Literacy and Numeracy in Current Curriculum
- Provincial Assessments – Student Learning Assessments
- Provincial Assessments – Diploma Programs
- Inclusive Education
- Career and Technology Foundations
- Learning Commons Policy
- Curriculum Development
- Other regional and provincial priorities

The funding facilitated delivery of professional learning supports for curriculum implementation that aligned with the priorities determined by Alberta Education. The supports provided by NRLC included high quality professional learning opportunities involving a wide variety of research-informed approaches and opportunities for educators that build capacity within schools and school jurisdictions, both regionally and provincially.

This work is summarized in the data of this report. Plans are underway with local district planning and partnership for the 2017-2018 school year as well.

Regional PD Collaboration Projects

In the 2016-2017 year, the NRLC team worked closely at a school and a jurisdiction level to co-plan and collaborate on effective professional development that met specific needs and initiatives identified by the jurisdictions. These programs, delivered during common district or school-based PD days continue to be an opportunity for embedded PD that creates professional learning communities across districts within a cohort learning environment to create lasting results and connections. These programs are open to Zone 1 teachers and support staff and are regularly subscribed to by those districts within a 500km radius. In the 2016-17 year, approximately 4800 participants took part in the collaborative projects.

Alberta Education

Alberta Education is the provincial government department responsible for the delivery of education programs and services for people of all ages. It works with parents, educators, business and industry to create opportunities for Albertans to learn throughout their lives.

NRLC Regional Curriculum Implementation Support Budget 2016 - 2017

Total Allocation $329,925.00

Base Funding	**2016-17 Proposed**	**2016-17 Actual**
NRLC Office Management and Support	75,000.00	32,300.52
Curriculum Support Consultant Salaries *	137,000.00	58,327.74
*Proportional Funding (*implementation priority support provided by the Consultant and or Executive Director where denoted below*		
First Nations, Métis and Inuit	14,000.00	7,516.61
Mathematics	26,000.00	23,238.34
Supporting competencies in current curriculum*	4,000.00	1,940.18
Supporting literacy and numeracy in current curriculum *	30,000.00	22,308.38
Provincial Assessment - Student Learner Assessments *	500.00	
Provincial Assessment – Diploma Programs	3,500.00	840.44
Inclusive Education *	18,000.00	19,114.83
Career and Technology Foundations	4,000.00	741.96
Learning Commons Policy	1,000.00	
Curriculum Development *	10,000.00	16,046.53
Other (Science, Technology, Coaching)*	6,925.00	4,814.47
	329,925.00	187190.00
Carry Forward		142,735.00
Note: 2016/17 Carry Forward Grant Funds are desginated for 2017/18 Curriculum expenditures, including Curriculum Facilitator. These funds are primarily a result of an un-filled Facilitator position for the last half of current year; as well as direct collaboration with PD stakeholders and partners on cost-recovery programming..		

Highlights and Accomplishments

Collaborative Project Success!

Funded or Supported through the Curriculum Grant and other Sources

The NRLC regularly supports program delivery in a variety of manners. One highly effective way to support, and meet our goals and mandate, is to collaborate on projects and conferences. Much of this work falls within our curriculum support, not necessarily with funding but rather with administrative support and brokerage services. These are examples of this support.

CASS FNMI Foundational Knowledge
NRLC co-hosted the CASS sponsored session on *The Path Forward with Reconciliation* foundational knowledge in High Prairie with 40 participants. It was an engaging group of people with several key questions and discussions, and we found it helpful to have two elders and Archbishop Gerard Pettipas in attendance to share their perspectives.

Central Peace Early Childhood Coalition Ten Talks Ten Talks Self-Regulation Webinars with Mike McKay. The NRLC assisted in coordinating and hosting two live webinar broadcasts for parents within the rural Central Peace EC Coalition boundaries. The Coalition provided locations, technology, staff, meals, and support for their parents to participate in this learning webinar with the Canadian Self Regulation Initiative. The NRLC hosted via Adobe Connect so participants could engage and learn about the science behind self-regulation, through online discussion with the presenter. These webinars were recorded for sharing and learning purposes, along with a learning guide. Liaison with 2017-18 Ten Talks will continue.

Early Childhood Coalition Committee (Parent Evening) Power of Kindness Community Event with Bill Gordon hosted in Grande Prairie. The NRLC has been working with the South Peace Area Rural Kids Early Development, the GP Family Centered Coalition, and the West County Coalition since 2014 to develop and deliver effective learning opportunities for professionals and family involved in early childhood service provision. Carrying on from previous events featuring Dr Gabor Mate, Dr Robbin Gibb, and Dr Deborah McNamara, Bill Gordon shared his message with approximately 100 community members.

Fort Vermilion School Division FVSD regularly requests liaison and brokerage services through the NRLC for their district start up days, and for the district inclusive education day. The September literacy day featured four provincial practitioner experts in Literacy, Numeracy, and Technology for grades K-12. During the Day of Inclusion event, over 250 FVSD educators received professional development from six practitioners brokered through the NRLC in addition to another eight regional jurisdiction staff. Topics such as ADHD, self-regulation, literacy, differentiated instruction, resiliency, and positive classroom strategies were covered for all grade levels and staff.

French Language Resource Centre The NRLC continues to partner with the FLRC to broker professional development within our zone. With the support of the FLRC Coordinator, Diana Boisvert, these programs serve to meet regional French and FSL educators' needs, through the federal Other Language Education Protocol grant held by the Southern Alberta Consortia for the ARPDC. In 2016-2017 ten (10) separate learning opportunities were co-hosted, serving 354 participants.

Grande Prairie & District Catholic Schools The NRLC curriculum consultant and mathematics team supported the GPCSD in co-designing and delivering four learning opportunities; including a district delivery of Curriculum Alignment for Literacy/Numeracy in Project-Based Learning.

Greater Peace ATA Local #13 PD Day The NRLC continues to work closely with the Greater Peace Local 13 ATA PD Committee by brokering speaker services and hosting the monthly committee meetings via the NRLC Adobe Connect platform on a monthly basis. The committee developed a district PD Day (October 24, 2016) featuring 29 sessions entitled *Self-Regulation Hearts & Minds Institute: Greater Peace ATA Local Fall PD Day and Institute*. Four hundred and sixteen participants attended this day in several school and district facilities.

Holy Family Catholic Regional Division Blanket Exercise NRLC has been working to ensure all jurisdictions engage with Blanket Exercise Awareness training and, if possible, Train the Trainer sessions as well. The Blanket Exercise is a teaching tool to share the historic and contemporary relationship between Indigenous and non-Indigenous peoples in Canada. **"**The Blanket Exercise is based on participatory popular education methodology with the goal to build understanding about our shared history as Indigenous and non-Indigenous peoples in Canada by walking through pre-contact, treaty-making, colonization and resistance. Everyone is actively involved as they step onto blankets that represent the land, and into the role of First Nations, Inuit and later Métis peoples. By engaging on an emotional and intellectual level, the Blanket Exercise effectively educates and increases empathy." https://www.kairosblanketexercise.org/

Little Red River Cree Nation Board of Education Within Treaty 8, LRRBOE serves four (4) school communities in Northern Alberta; with an estimated staff base of 130 fte and over 1100 students. For the past two years, the NRLC has liaised with LRRBOE to develop and share in hosting of two days of training in the fall for all Educational Assistants; while administrators and teachers are also getting ready for the new school year. These mini conferences are held in High Level and all staff travel from their remote locations of Fox Lake, John D'or Prairie, and Garden River. Additionally, we have assisted with brokering facilitators for the annual Treaty 8 education conference in Edmonton in March.

Northwest Region Council for Inclusive Education The regional group of NRCIE requests liaison services from NRLC to assist in processing contracts, hosting registrations, and event promotions. The one day workshop of Applied Behaviour Analysis (Autism) with Bruce Boyd was attended by 49 educators.

Peace Wapiti School Division For several years the NRLC has worked closely with the PWSD to support their district in developing professional learning opportunities based on district priorities and goals. Delivered during district or school pd days, these learning opportunities were developed in a cohort-based model to promote the team and peer-to-peer learning aspect. Topics included CTS/CTF, Science, Social Studies, and Assessment.

Conferences!

Funded or Supported through the Curriculum Grant:

- **North Zone Education Assistant Conference**
- **Little Red River BOE EA Mini Conference**
- **Self-Regulation Hearts & Minds Institute**
- **Peace Wapiti Google Summit**
- **Our Kids Our Tomorrow: Parent and Community Conference, Horse Lake First Nations**
  This Parent Community Conference, held October 17, 2016, was the first one of three planned for the next three years. Peace Wapiti School Division and Horse Lake First Nations received a federal grant this conference is part of that deliverable. The Planning Committee met five times during the school year working together to ensure the success of this community endeavor.

SAMPLE RESPONSES from *First Nations Métis Inuit* sessions

An aspect of this learning opportunity that made it meaningful is:

- ✓ Helped me to understand the topic better, and allowed me to reflect personally on my own opinions.
- ✓ The participation in the exercise itself provided an active chance to engage in the theory and history.
- ✓ Excellent speaker that made me reflect about present practices and think about how it can be different.
- ✓ Further understanding that this history is not just something that happened in history but rather a compilation of stories and experiences of people.

An aspect that might be improved:

- ✓ A copy of presentation – plus a timeline for history. Important for context.
- ✓ Less emphasis on religious/spiritual overtones and more on history. Not appropriate in a secular public school or any school not identified to parents as a native spirituality focused school (ie charter school).
- ✓ More time to reflect on the information received and how we can move forward.

One thing I require to further support my professional learning on this topic is:

- ✓ More foundational knowledge, Indigenous pedagogy and Indigenous knowledge (ways of knowing).
- ✓ Having a clear idea of who the resources are in our community that are available to come in to the school for professional learning for the teachers.

FOLLOW UP SURVEY (completed approximately 30 days following the event)

Please share any comments on how you have increased awareness with colleagues:

- ✓ Totally enjoyed the experience. It made all the 'facts' that I've read about and heard about all come to life.
- ✓ Facilitated the Blanket Exercise with three schools and am booked every Friday until the end of June to facilitate at 7 others.

Please describe what you did or tried since the learning opportunity:

- ✓ I was able to facilitate a Blanket Exercise with the staff of my school with the assistance of two students who were also involved with the BE training. We have plan to carry out the BE with our Grade 7 students as well before the end of the school year.
- ✓ More research on the ceremony before I thought about bringing it to the staff. I have been consulting with the principle and an elder of the community and it has been a learning process for us all.

One thing I observed after applying the new learning with staff and students (observable result):

- ✓ I have used some of the questions we came away with from our last session in team meetings with staff and families.
- ✓ How the Blanket Exercise raised such awareness of where people were at in understanding their foundational knowledge of Indigenous people, history and culture. It is an amazing learning tool.
- ✓ Nothing observed yet but staff were every engaged and interested in the experience

"To ensure that investments in professional learning produce the intended results and that sufficient professional learning occurs aligned with new initiatives, the very nature of professional learning within an education system must be focused on increasing student achievement."

Source: Killion, J (2013) Comprehensive professional learning system: A Workbook for States and Districts. Oxford, OH: Learning Forward

NRLC Collaborative Projects 2016 - 2017	Learning Opportunities	Session Total	Registrations
CASS FNMI Foundational Knowledge	1	1	40
Central Peace Early Childhood Coalition Ten Talks	1	2	57
Early Childhood Coalitions	1	1	37
Fort Vermilion School Division	5	35	952
French Language Resource Centre	10	28	354
Grande Prairie Catholic School Division	4	6	218
Grande Prairie Public School District	18	48	1093
Greater Peace ATA Local 13 PD Day	1	30	416
High Prairie School Division	2	2	22
Holy Family Catholic Regional Division Blanket Exercise	1	2	78
Little Red River Board of Education	2	16	135
Northern Lakes Collaborative Services	3	9	276
Northland School Division	7	11	307
NRLC/ATA FNMI Zone 1 Advisory Committee	1	1	49
Northwest Region Council for Inclusive Education	1	1	49
Peace River School Division	4	10	241
Peace Wapiti School Division	8	16	353
Summer Numeracy Institute	4	8	229
	76	**219**	**4774**

~ Collaborative Partnerships & Project success stories are included on pages 17 & 18 *Highlights and Accomplishments*

Regional PD Statistics and Participation 2016-2017

The NRLC planned five hundred forty-one (541) regional professional development sessions through our Consortium in 2016-17 hosted primarily in Grande Prairie and Peace River, with some sessions offered in High Prairie and High Level upon district request. These locations have proven to be the most readily and easily accessible by participants across our geographical area. Of these sessions, 406 were developed and funded under the Curriculum Implementation Grant and served 6,403 registrants. We continue to develop and participate in innovative steps to provide delivery of PD via online means, including ARPDC initiatives such as Adobe Connect Webinars, Learning Portal curriculum resources, Community of Practices, Google Hangout, and webcasts. Distributive learning opportunities continue to develop regionally and provincially; as do well-trained and able facilitators.

NRLC continues a trend of planning, developing, and implementing a greater number of learning opportunities, based on identified zone needs and Alberta Education priorities; with fewer cancellations over the past five years due primarily to this more collaborative approach to planning. These learning opportunities continue to be flexible in meeting needs such as delivering to smaller groups, delivering as class support, and delivering online to team groups or community of practices. Many of these opportunities continue on the emphasis of building into long term learning plans and cohorts, as one program may be delivered over two or three dates. While quite a few learning opportunities are organized as a single day delivery, more are often organized based on follow-up or repeat requests (i.e., Northwest Region Council for Inclusive Education) generated during an active learning opportunity.

Over the past few years the NRLC, as well as most of our sister consortia, have moved to online pre-registrations for workshops and conferences. It is the most effective means of ensuring facilities and presenters are best prepared for the day(s). It is especially vital for multi-session conferences or cohort series. This continues to be an effective, yet challenging, piece of our regional operations; and involves building an effective communication and support plan with school staff, IT departments, and district leaders. Pre-registration also impacts the number of cancellations, as we know ahead of time how to approach our partners on low registrations. As our website becomes more engaging and effective for users, it also becomes an effective tool to generate requests for regional learning opportunities.

The chart below provides a summary of programs by subject area, indicating the variety of ongoing professional learning opportunities offered through this past year. This is an overall summary of programming, the majority of which flows through the Curriculum Implementation Grant.

Alberta Regional Professional Development Consortia (ARPDC)

In order to be consistent in determining participation rates among consortia, ARPDC has developed a PD counting model. The guidelines used by the seven consortia are:

- Half day, full day or partial day sessions count as one day (The time to organize a full day or half day session is the same.)
- Each day of a series counts as one day of PD. Participant numbers are counted for each day.
- Conference over multiple days: each day counts as a day of PD, regardless of the number of contracts and presenters. (a subset of sessions is added in further detail to final count report)
- Conference with multiple sessions in one day still counts as one day.
- Webinars are counted as “one day” due to the time to train facilitators, moderate sessions, develop conversation guides and post archives.

The NRLC further has developed a counting system that more accurately reflects the number of deliveries as a session total within one learning opportunity cohort. Grouping and counting LO’s and session by priority gives a more definitive summary and understanding of the consortia work.

PD Programs & Participants

	2012-13	2013-14	2014-15	2015-16	2016-17
Participants	12,547	12,180	11,604	11,901	9258
Programs Planned	395	480	437	579	541

Five-year comparison of attendance by Zone 1 jurisdictions in NRLC PD. Note that some jurisdiction schools are served by other ARPDC consortia and will appear in those reports. Attendance is influenced by distance and location within the region, weather, travel, and transportation which affects access to some communities. To alleviate these restricting influences consideration is given to the use of online delivery methods such as Adobe Connect webinar or video conference (although VC is becoming an outdated means of delivery); as well as access to the online learning resources on the ARPDC Learning Portal.

For this chart we have included the MPTC sessions and participants as the norm in previous reports.

Meetings have been included in these totals as most are related to programming and will include presentations to the group. Example: FNMI Advisory, Curriculum Coordinators meeting.

Curriculum Implementation Grant – Meeting Expectations

The Northwest Regional Learning Consortium provided PD opportunities in the following areas which were covered under the Curriculum Implementation grant. These sessions demonstrate NRLC's ability to meet the diverse regional needs of all stakeholders.

Regional Plan Priority Area Learning Opportunities Funded Under the Curriculum Implementation Grant

Focus	Learning Opportunities	Sessions	Registrations
Competencies	3	4	72
Curriculum Development	40	40	464
CTF	3	3	33
Diploma Programs	4	5	83
FNMI	7	11	547
Inclusive Education	19	219	3064
Literacy	10	30	975
Literacy/Numeracy	4	9	167
Math	2	13	211
Other: Leadership	4	7	216
Other:Mental Health	1	4	22
Other:Technology	5	50	264
Other:Inclusive Ed	7	11	285
	109	**406**	**6403**

NRLC Stakeholder Projects Sourced or Funded Under Separate Grants

As part of the NRLC operations, our consortium work and planning has been fine tuned in response to building our knowledge of effective professional development design and meeting the expectations of Alberta Education, School Jurisdiction Business Plans, and regional stakeholder priorities as they align with provincial Alberta Education priorities. With a focus on the success of all students, the NRLC works closely with several key regional planning teams as to develop those projects and learning opportunities on emergent priorities as well. A collaborative approach is modeled when working with members of Early Learning Coalitions, Child Support Services, local First Nation Bands, and other community service committees to meet these priorities and initiatives identified.

These programs, not directly supported with specific Curriculum Grant funding, are supported with administrative staff time and consortium registration services. These programs are open to Zone 1 teachers, support staff and parents. They are regularly subscribed to by those districts within a 500km radius; including educators from British Columbia.

Focus	Learning Opportunities	Sessions	Registrations
Elementary Math PLO	6	13	318
FNMI	3	3	69
FSL - Literacy	3	10	88
FI / French LA Literacy	7	18	266
High School Redesign	1	1	66
Inclusive Education	6	65	1062
Leadership	1	3	778
	27	**113**	**2647**

Sample Response from *First Nations Métis Inuit* session

An aspect of this learning opportunity that made it meaningful is:

The participation, sharing and reflection. It was also meaningful because it represented our area. I am able to take what I learned and bring it in to the classroom pretty much as is. I really want to emphasize how well put together this workshop was and the organizers and Elder were absolutely amazing. I think we need more of these types of workshops. I loved it. Thanks Shannon for putting this together. I also love that students have the opportunity to participate. I think we need more student participation workshops as well. Build our district leaders.

Other Regional and Provincial Priorities

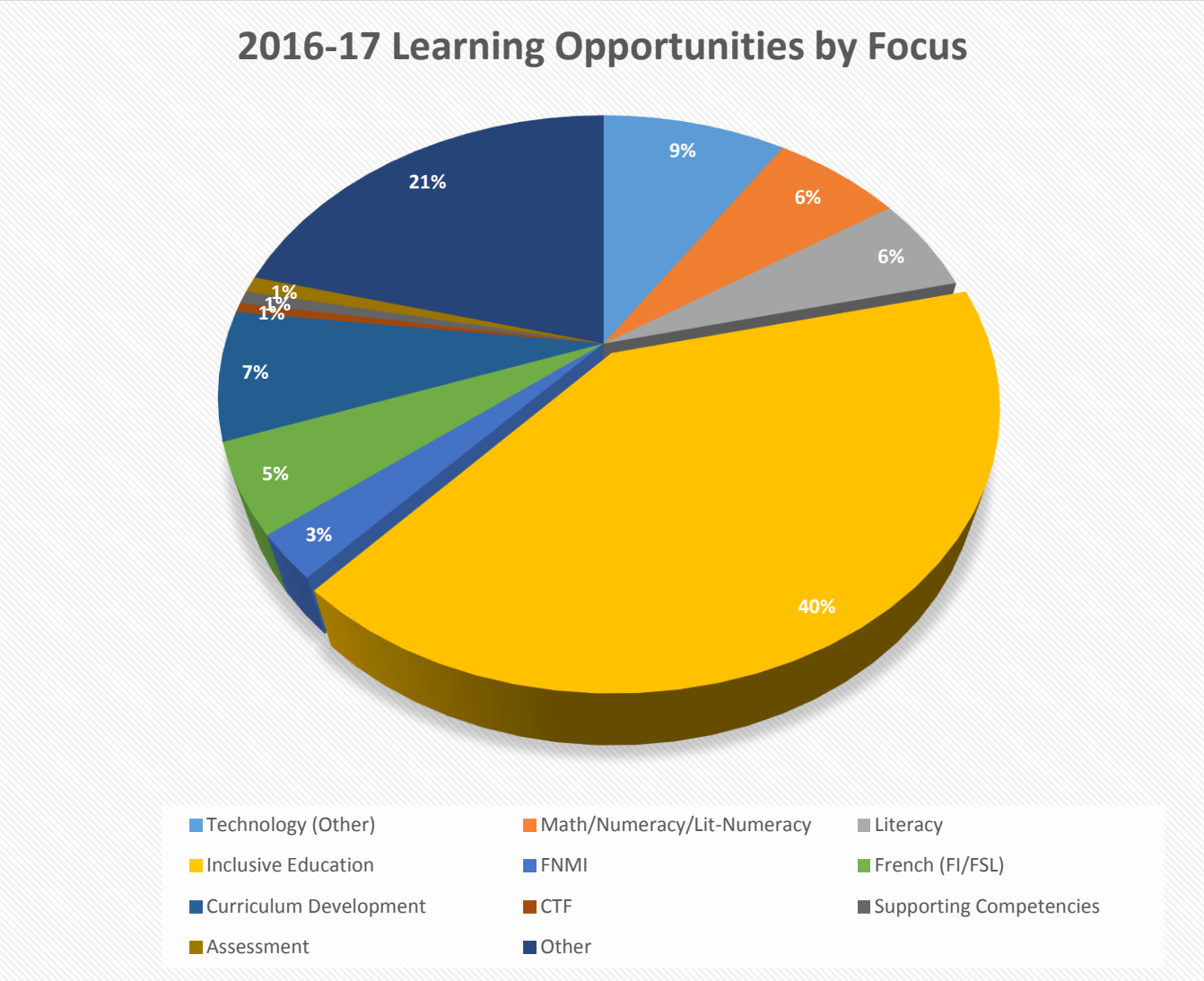
Professional learning support identified as a need by regional consortia or Alberta Education in topics or subjects that relate to Curriculum Implementation areas, provided this support strengthens the application of the priorities identified.

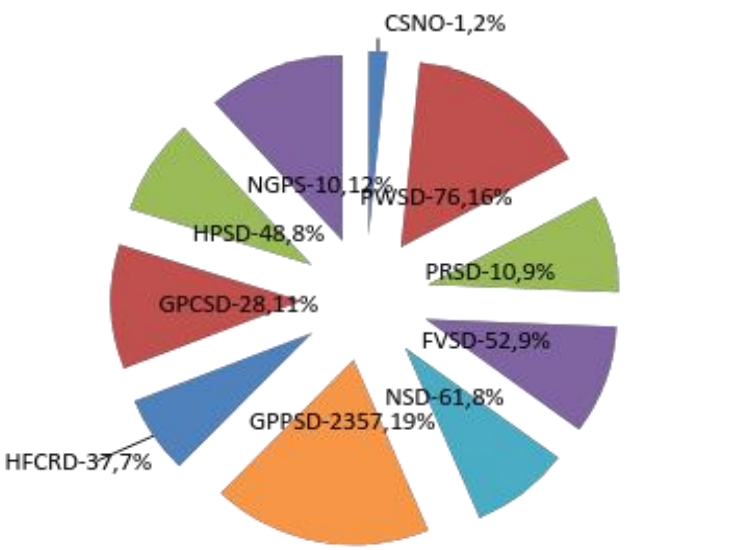
Quantitative Stats: **LO** – Learning Opportunity / **S-** Session / **R** - Registrations

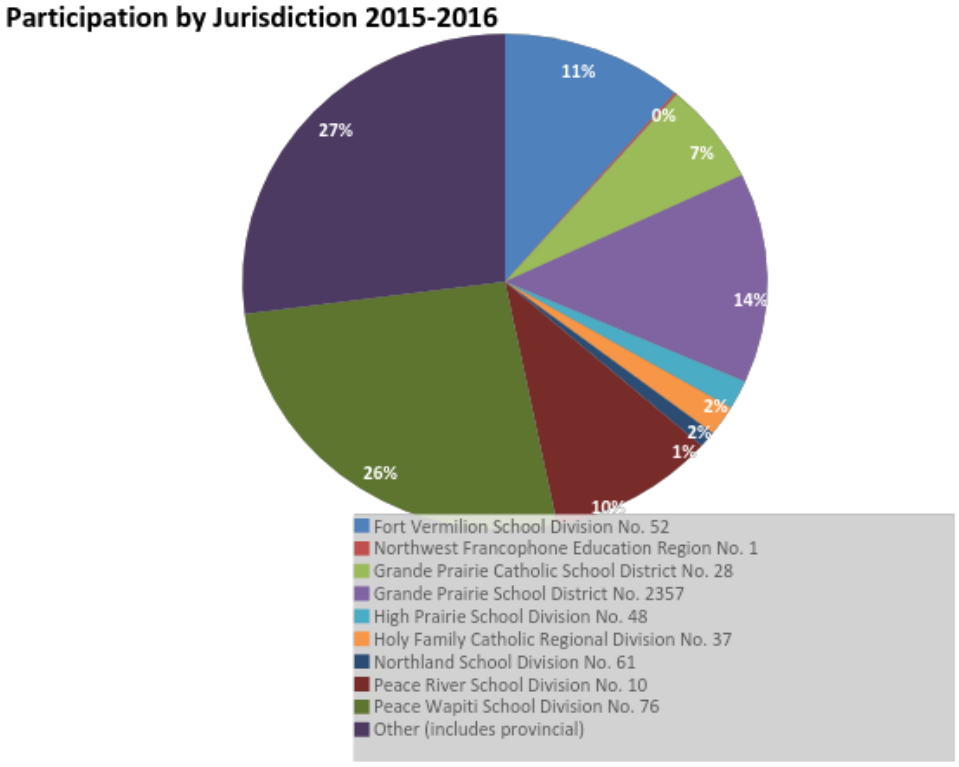
FNMI Conference ~ Our Kids Our Tomorrow: Parent and Community Conference	1 LO / 1 S / 27 R	~ Horse Lake First Nation & Peace Wapiti School Division
Early Learning ~ Early Childhood Conference 2016	2 LO / 44 S / 466 R	~ Stepping Stones Daycare Society
Professional Leadership ~ Building Capacity: 2016 Peace Country Child Abuse Conference ~ Child Forensic Interviewer Training	3 LO / 4 S / 344 R 1 cancelled session	~ Caribou Centre, PACE-Grande Prairie
Inclusive Education ~ Transitioning…Life After High School (parent evening with 9 breakout sessions)	1 LO/ 2 S/ 50 R	~ GPPSD #2357 ~ GPCSD #28 ~ PWSD #76
Inclusive Education ~ Life's Challenges in Secondary School (evening workshop) ~ A Path Forward Conference	1 LO / 2 S / 89 R	~ Grande Prairie Crime Prevention
French ~ Vers une approche intégrée en immersion ~ DELF (6 days) ~ French sessions at MPTC (8 sessions) ~ FI - Northern Divisions PPLC (3 days) ~ FSL - All District PLC (3 days) ~ L'approche neurolinguistique (5 days) ~ AIM (2 days) Cancelled	9 LO / 26 S / 354 R 2 cancelled sessions	~ The *French Language Resource* Centre representing thirteen partners including seven school boards: GPPSD, PWSD, GPCSD, PRSD, CSNO, HFCRD, HPSD and Académie of Nancy-Metz
Professional Leadership ~ CASS Alberta Education Annual Learning Conference	3 LO / 778 R	**Fee for Service** CASS

Technology Mediated Learning Opportunities

2016 - 2017	Number of Events	Face to Face / In Person	Attending via Technology	Total Participants
Meetings/Advisory Groups	10		104	104
PD Learning Opportunities	47	461	513	974







- Other includes Federal, Band, Private, Charter, and provincial ARPDC or partner participants
- Band and Métis Settlement school attendance is reflected within the participant's school jurisdiction

NRLC's Ongoing Needs Assessments and Stakeholder Surveys

An ongoing needs assessment is carried out throughout the year through NRLC's evaluation process. The program evaluation forms are reviewed constantly and programs are developed to meet those needs.

These evaluation forms answer the following questions:

- What is the quality of the presenter?
- Has the presenter met the learning goals of the session?
- How well did the session meet the needs of participants?
- How did the session influence improvement in the teacher's practice and therefore enhancing student learning?
- Which topics/speakers would participants suggest for future programs?

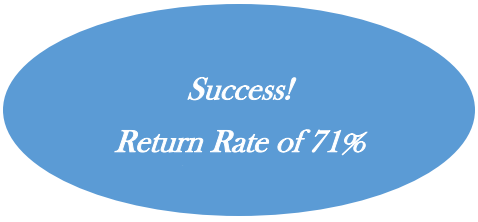
NRLC continues to use electronic online PD evaluations sent directly to each participant following their learning activity; with continued challenge in securing responses. At the beginning of the year, in some specific learning opportunity forums and projects, and with certain populations or cohort groups, paper evaluations which are completed at the end of each opportunity are used. Developing a common and effective communications plan to increase the return rate continues with each stakeholder conversation as we convey the importance of participant feedback in guiding regional work that meets their needs.

Continuing the practice of all regional consortia, we also distribute a provincially designed follow-up evaluation approximately thirty days after a learning opportunity. This is a simple design, concise three question survey, intended to capture teacher (educator) practice and impact of the professional learning. Our facilitators, consultants, and staff teams offer much encouragement to the participating educators to voice how they are applying new knowledge and strategies into their classroom practice. As we meet our mandate of serving the needs of students, we recognize the need to empower teachers, offering them continual support to sustain that involvement. Effective delivery and processing of evaluations is one tool we can use in this task.

Provincial collaboration is valued by the NRLC, and yet is also a challenge (we encourage use of online resources, shared websites, and webinars) as we continue to provide services and meet our mandate. Regional teachers have increased opportunity to participate provincially, especially as web-based delivery is becoming the norm with Adobe Connect learning sessions (134) hosted by the ARPDC (see Appendix B).

The following section details the provincial aspects of the NRLC in conjunction with the ARPDC in a format that has been developed and used provincially.

In 2016–17, NRLC received 3,242 individual evaluations out of a possible 4,577 (number of participants receiving evaluations) for a **return rate of 71%.** This level of feedback really guides our future work and we thank all our participants.



Professional Learning Reflection and Needs Assessment

*Distributed immediately following the learning opportunity electronically or paper version during.

PD Satisfaction Results - Cumulative Participant Survey Responses 2016-17:
Quantitative Results – SAMPLE RESPONSES detailed throughout this report

95.3% satisfaction *with the following:*

This professional learning opportunity:
1. contributed to my awareness and/or deeper understanding of the topic.
2. provided opportunities for me to be actively involved in the learning.
3. provided strategies for integration of the learning into my current practice.
4. provided opportunity for me to reflect on my knowledge, skills and attributes about the topic

97% satisfaction *with the following:*

1. was provided at a reasonable cost.

Qualitative Results – SAMPLE RESPONSES detailed throughout this report

1. An aspect of this learning opportunity that made it meaningful is:
2. An aspect of this learning opportunity that might be improved is:
3. One thing I require to further support my professional learning on this topic is:

Professional Learning Reflection

*Sent to participants approximately 1 month following the learning opportunity (appendix F)

1. I shared and/or discussed the new learning with colleagues. (ie: measure of awareness)
2. I applied the new learning with my staff or students. (ie: measure of application)
3. One thing I observed after applying the new learning with staff and students (ie: observable result)

Throughout this report, you will find **SAMPLE RESPONSES** taken directly from the *NRLC's* **Professional Learning Reflection and Needs Assessment** forms completed by participants following each learning opportunity or the **Learning Reflection** distributed electronically after approximately 30 days.

NRLC Annual Stakeholder Survey

The Northwest Regional Learning Consortium reports annually through a Stakeholder Survey from educational stakeholders, the school jurisdictions we serve. An electronic survey is distributed within Zone 1 to approximately 143 recipients (superintendents, PD Chairs, PD committees, project partners, curriculum contacts, advisory teams), with a 25% return rate from stakeholders. Results of this survey are reported in the accountability measures for each ARPDC goal outlined. NRLC will continue to seek to improve the response rate for the coming year through various measures including focus group discussions, specific jurisdiction conversations and planning, and through CASS meetings. The Executive Director is an affiliate member of CASS and attends the meetings to build understanding and context. The face to face opportunities for conversation and brain-storming are much appreciated as we continue to look at longer term planning now with more sustainable curriculum support funding in the future.

NRLC Annual Stakeholder Survey Respondent Comments

- ✓ Great people to work with.
- ✓ I am with the ATA Local PD committee. The NRLC is absolutely invaluable and so very helpful as we are planning our professional development day. Couldn't do it without them! :)
- ✓ I appreciate the long-standing collaborative relationship and the ability to customize a series to our needs.
- ✓ I appreciated very much the accessibility of the consortium, their wealth of knowledge, contacts, referrals, and regular support.
- ✓ I believe the consortium does a great job for the teachers who live in the Grande Prairie area. And even at times for those in the Peace River area. However we rarely are able to use the services as we live too far away to attend most PD. A lot of the PD offered this year I found was a series of days which also makes it difficult for us to attend because we cannot take that much time off.
- ✓ I have so much appreciated working with the NRLC team. They have been helpful and provided very good service
- ✓ I have worked in partnership with the consortium to put on PD. They are so great to work with, organized and responsive. Jenn is awesome!
- ✓ Information and advice on conference planning was valuable to our organization.
- ✓ NRLC is an excellent group of people to work with.
- ✓ Our jurisdiction is not active enough in requesting support from NRLC. When requested, NRLC has been very responsive in supporting us.
- ✓ Our school division has only one town in the NRLC zone, but we do watch the offerings made by you and are very interested in several sessions and topics organized. We are hoping to work together with NRLC to bring some professional learning to our Valleyview schools and their community next year.
- ✓ Really appreciated working with consortium. Provide a wide variety of PD opportunities and were able also to help with individual PD needs Great service, great people. Thank you!!
- ✓ The Consortium has been especially helpful in planning the ATA annual Fall PD Day which addresses the needs of all teachers in the Peace River Local. We are grateful for their support, use of technology, and ability to connect us with speakers/presenters.
- ✓ The entire staff is always very helpful.

Joint ATA / NRLC Needs Assessment Survey

In our on-going effort to meet locally identified needs in congruence with provincial direction, an up-dated joint ATA/NRLC needs assessment survey was circulated in early April 2017 and the results shared with the Zone 1 Curriculum Coordinator Meeting on May 11, 2017 in Peace River. An electronic copy went out to all jurisdiction leaders, PD and Convention Chairs as well. All responses are anonymous.

We sincerely appreciate the effort made and thank those who completed these surveys. All survey responses are taken very seriously and NRLC works diligently to provide the best possible professional development experiences for educators and support staff in Zone 1. These needs assessment surveys are one of many ways we seek to discover and meet the needs of our jurisdictions.

Support Staff Needs Assessment

Almost 200 responses were received from Zone 1 support staff which encompasses a wide variety of positions including Educational Assistants, Library and Office Staff, Liaison Workers, Speech/Language workers, etc. A variety of questions were asked regarding support staff's needs to best support teachers and students in the classroom, educational technologies, past PD opportunities, as well as questions to determine the most effective timing and format of learning opportunities. These responses will assist NRLC staff in developing pertinent, timely and effective learning opportunities for support staff in the future.

- ✓ **Support Staff Needs Assessment Sample**
- ✓ Question: *What specific professional learning topics would assist you with developing strategies and practice for the areas that you work? Select at least one response and no more than three responses*.
- ✓ Top responses:
- ✓ Dealing with Difficult Behaviors (73.5%)
- ✓ Continuum of Support to Help Build Independence (32.5%)
- ✓ Helping Students Read in Content/subject Areas (15.7%)

Teacher Needs Assessment

Two hundred and seventy-one (271) educators from across our region responded to the Teacher Needs Assessment survey. Questions were designed to assist in identifying the needs of teachers and administrators and also provided an opportunity to comment and provide suggestions. Below is a small sampling of the survey results.

- ✓ **Teacher Needs Assessment Sample**
- ✓ Question: *Please select up to three curriculum or program areas for your professional learning needs over the next two years.*
- ✓ Top responses:
- ✓ Mathematics (34.1%)
- ✓ Inclusive Education (33.3%)
- ✓ English Language Arts (31.8%)
- ✓ Question**:** *Please select up to three curriculum enhancement areas for your professional learning needs over the next two years.*
- ✓ Top responses:
- ✓ Literacy Across the Curriculum (37.2%
- ✓ Inclusive Education Practices (33.7%)
- ✓ Numeracy Across the Curriculum (29.5%)
- ✓ Effective Technology to Support the Curriculum (29.5%)
- ✓ **Joint ATA/NRLC Needs Assessment TEACHER Survey - Sample**
- ✓ Question: *Please indicate your professional learning needs in relation to supporting student needs in the classroom.*
- ✓ Top responses:
- ✓ Supporting Students with Difficult Behaviors (69.8%)
- ✓ Supporting Students with Self-Regulation Issues (47.3%)
- ✓ Supporting Students with Mental Health Issues (39.5%)

NRLC Accountability Measures

ARPDC Goal One

Facilitate professional development which supports the effective implementation of:

- The Alberta Learning Business Plan
- Jurisdiction and school education plans; and
- Regional School Council plans

Outcome 1.1 Work collaboratively through ARPDC, Alberta Education, regional school authority District Contacts and Advisory Committees to establish plans, strategies and opportunities that are responsive to the provincial and locally identified needs in congruence with provincial directions for education.

Outcome 1.2 Demonstrate effective provincial planning through the development of a common consortia Provincial Plan to Support Curriculum Development that promotes consistency in learning opportunities.

Strategies Used to Achieve Goal One

NRLC	ARPDC	Partners
Host regional jurisdictional District Contact and Advisory Committee meetings around the key areas identified in the Curriculum Implementation priority areas.	Hold collaborative conversations with Alberta Education personnel to understand provincial direction and how the consortium may support their work in our region and through regional plans.	Hold meetings with stakeholders (ASCA, ATA) to determine deliverables related to Curriculum Implementation.
Hold collaborative conversations with jurisdictional representatives to understand the needs for professional learning based on their Three Year Education Plan.	Hold meetings with key Alberta Education contacts to determine deliverables related to Curriculum Implementation priority areas and develop understanding of the Alberta Education Business Plan.	Hold collaborative conversations with stakeholders to understand how the consortium may support their work in the region related to Curriculum Implementation priority areas.
Conduct post learning opportunity surveys with participants to help identify additional learning needs	Conduct a common post survey for administration to session participants.	Develop a common needs assessment with ATA to determine stakeholder needs.

OUTPUTS GOAL 1

Performance Measures	Metric	Results Qualitative
Overall percentage of stakeholders that are satisfied that the consortium effectively addresses provincial and regional needs identified in planning documents.	Survey of stakeholders	• 93.3% agreed that PD offerings aligned with identified plans.
Number of participants that attended NRLC PD offerings.	Participant Count	• 142 learning opportunities • 541 planned sessions • 10 cancelled sessions • 9,258 participants attended NRLC offerings
Overall percentage of stakeholders that were satisfied with the consortium's response to emerging PD needs, outside of those identified in planning documents.	Survey of stakeholders	• 90.9% of program participants were satisfied with services provided by the Consortium
Number of collaborative meetings for ARPDC in actualizing the priority areas provincially.	Record of ARPDC Executive Directors Meetings	• 14 face-to-face meetings; 4 Adobe Connect meetings; 106 guests
Host formal/informal conversations with key Alberta Education personnel.		• Ongoing
Host regional jurisdictional District Contact and Advisory Committee meetings to provide direction for planning learning opportunities and to positively impact district leadership and teacher practice.	Advisory Committees: • FNMI Advisory • French Language • Early Learning • 8 School Districts	• 9 GP ATA online planning meetings • 5 FNMI Advisory Committee meetings • 1 PLC planning meeting • 2 Inclusive Education *(Ten Talks)* meetings • 4 French Language Advisory meetings as part of the Regional French Language Resource Center • Met with Early Childhood Coalition groups to plan and support parent and professional sessions.
Administer multiple surveys to	Bi-annual ATA/Consortium	• Reviewed Joint Survey

gather data to inform future planning.	Needs Assessment *ARPDC Professional* *Professional Learning Reflection and Needs Assessment* survey *Learning Reflection [Follow up]* survey NRLC Educational Stakeholder Survey	Administered Spring 2017 results. • Administered following each learning opportunity. • Administered approximately 30 days following each learning opportunity. • Administered June 2017
Satisfaction of stakeholder contacts with Consortium services overall	Survey of Stakeholders	100% of program participants were satisfied with the services provided by the Consortium.

OUTCOMES GOAL 1

Stakeholder Survey Results

The Consortium was effective in helping us address needs identified in our planning documents.				
2012-13	2013-14	2014-15	2015-16	2016-17
89%	100%	100%	91.3%	93.3%

Analysis of Outcomes of Goal One

NRLC reviews district three year education plans and discusses priorities for the zone at advisory meetings. Individual meetings with district personnel allow NRLC to more fully understand district context (e.g. release days, PLC times, and district priorities) and include this in zone-wide planning. Individual or small group multi-district meetings allow NRLC to assist with more in-depth planning, as well as providing information and context that minimizes scheduling conflicts and works to ensure PD that will be timely, relevant and well attended.

NRLC offerings align with stakeholders' needs identified through planning documents and consultation. The ability to work with districts to design specific programs across the school year and, in many cases, collaborate with other school districts is highly valued in our northern context. The goal continues to be reasonable local access and joint district and NRLC program support. We were fortunate to have the NRLC Curriculum facilitator take on much of this work in 2016 and the shared google document was appreciated and well used by members of Jurisdiction planning groups as they planned professional learning opportunities.

We are completing the first year of the Curriculum Implementation grant process through the Funding Manual regulations; the following information was developed to share with our Jurisdictions and to guide our work. A key mid-term report is presented to Alberta Education by January 31 of each year with opportunities to share successes and challenges through the field work completed. Acceptance of this report releases the final third of the grant payment to NRLC. This process is working well and we have included an excerpt of findings from the 2016-2017 report here.

NRLC - Curriculum Implementation and Support Plan - Mid-term Report

Purpose:

1a. Accountability to the province - Alberta Education
1b. Indicators for future funding
2a. Shared knowledge of programming and priority within NRLC zone
2b. Create opportunities for future collaboration
3a. Accountability and evidence of progress
3b. Creates opportunity for feedback and future direction from Management Team
4a. Increased collaboration and celebration
4b. Effective data alignment
4c. Keeps team on track - focus on new opportunities for future offerings
4d. Helps clarify engagement in role assignments and duties

Content (all, not specific to audience):

1. Set out clear priorities
2. Provide evidence of how priorities are met
3. Demonstrate alignment with district goals and needs
4. Provide context for programming and evolving needs
5. Allows process to be explicit and transparent
6. Provides a communication process/tool with stakeholders
7. Demonstrates need for joint/collaborative planning between NRLC and districts and NRLC/Zone

Progress towards Goal #1

1. Creation of a Jurisdictional Joint Calendar - shared out to all Superintendents.
2. Creation of contact and engagement list for all key priority areas - shared out to all Curriculum Coordinator Contacts.
3. Creation of a Needs Assessment for each district for professional learning in relation to Alberta Education funding priorities.
4. Compilation and analysis of Needs Assessment for professional learning opportunities moving forward shared back out to Curriculum Coordinators.
5. Gaps and strengths comparative analysis of District expressed needs versus funded priority areas.
6. Cross-referenced and compared District stated needs with District 3 year plans.
7. Development towards more effective and timely sharing of key resources through alternate means such as shared Google folders and the development of Communities of Practice, for example, First Nations, Métis and Inuit Advisory Committee.
8. Developmental work towards new website format and content design in relation to Resource Development and Sharing.
9. Developmental work towards a comprehensive Professional Learning Design Plan to facilitate better, more comprehensive, and more timely professional learning plans with our districts and across our jurisdiction.
10. Ongoing work with ARPDC partners in Professional Learning Resource Development, for example, Literacy and Numeracy Progressions.

ARPDC Goal Two

Facilitate professional development which supports the effective implementation of curricula, including instruction, assessment, and student learning outcomes.

Outcome 2.1 Develop processes, tools and resources to support school authority implementation and for the collection, tracking and reporting of 'evidence'.

Outcome 2.2 Provide scheduled professional learning sessions in the following areas: ·First Nations, Métis, and Inuit ·Mathematics. Supporting Competencies in Current Curriculum · Supporting Literacy and Numeracy in Current Curriculum ·Provincial Assessments – Student Learning Assessments ·Provincial Assessments – Diploma Programs ·Inclusive Education ·Career and Technology Foundations ·Learning Commons Policy ·Curriculum Development ·Other regional and provincial priorities

Strategies Used to Achieve Goal Two

NRLC	ARPDC	Partners
• Work with and model the use of "A Guide to Comprehensive Professional Development" and "A Guide to Support Implementation: Essential Conditions."	• Work with and model the use of "A Guide to Comprehensive Professional Development" and "A Guide to Support Implementation: Essential Conditions" to support jurisdictions in the curriculum redesign implementation.	• Work with and model the use of "A Guide to Comprehensive Professional Development" and "A Guide to Support Implementation: Essential Conditions" to understand how the consortium may support stakeholders' work related to curriculum redesign.
• Develop plans and processes that reflect change management elements and cultural shifts required for transformational change.	• Work towards developing provincial plans and processes that reflect change management elements and cultural shifts required for transformational change.	• Work with stakeholders to understand how the consortium may support provincial plans and processes that reflect transformational change.
• Provide professional learning opportunities to support curriculum implementation based on regional needs.	• Provide consortia support in developing learning opportunities to support curriculum implementation based on consortia expertise.	• Work with stakeholders to align learning opportunities to support curriculum implementation.
• Assist educators with understanding components of new curriculum and their roles and responsibilities in implementation.	• Assist consortia with understanding the components of new curriculum and their roles and responsibilities in implementation.	• Assist partners with understanding the components of new curriculum and their roles and responsibilities in implementation.
• Establish communities of practice based on related research and/or field experts.	• Support communities of practice based on related research and/ or field experts.	• Communicate with partners the available communities of practice in the region and province.

OUTPUTS GOAL TWO

Performance Measures	Metrics	Results
Overall percentage of stakeholder's satisfied that the PD offered by the consortium supported effective curriculum implementation.	Survey of educational stakeholders	93.3% of district contacts were satisfied that NRLC facilitated PD supports for effective implementation of curricula
Percentage of participants satisfied that NRLC sessions influenced their practice.	*Professional Learning Reflection* submitted by session attendees 30+ days following the learning opportunity. (#1)	98% of PD program participants were satisfied that sessions influenced their practice
Overall percentage of school authorities having access to online materials created by ARPDC and/or ERLC.	These "made in Alberta" resources include videos and learning guides, archived webinars, facilitator guides, and a collection of resource websites. www.arpdcresources.ca	100%of districts have access
Number of sessions and participants attending learning opportunities in the following areas: ● First Nation, Métis and Inuit ● Mathematics ● Supporting Competencies in Current Curriculum ● Supporting Literacy and Numeracy in Current Curriculum ● Provincial Assessments: Student Learning Assessments ● Provincial Assessments: Diploma Programs ● Inclusive Education ● Career and Technology Foundations ● Learning Commons Policy ● Curriculum Development ● Other Regional and Provincial Priorities	Registration Data LO – Learning Opportunities S – Sessions R - Registrants	● First Nation, Métis and Inuit 10 LO / 14 S / 616 R ● Mathematics 8 LO / 26 S / 529 R ● Competencies 3 LO / 4 S / 72 R ● Literacy and Numeracy 14 LO / 39 S / 1142 R ● Diploma Programs 4 LO / 5 S / 83 R ● Inclusive Education 33 LO / 299 S / 4433 R ● Career and Technology Foundations 3 LO / 3 S / 33 R ● Curriculum Development 40 LO / 40 S / 464 R Other regional & provincial priorities: ● French (FI/FSL) 10 LO / 28 S / 354 R ● Leadership 5 LO / 10 S / 994 R ● Technology 5 LO / 50 S / 264 R ● High School Redesign

		1 LO / 1 S / 66 R
Overall percentage of participants satisfied that they were provided opportunities to be actively involved in the learning.	*Professional Learning Reflection and Needs Assessment survey* administered immediately following the learning opportunity. (#2)	98% of PD program participants were satisfied that sessions provided opportunities to be actively involved in the learning.
Overall percentage of stakeholder's satisfied that the consortium PD opportunities influenced leadership and/or teacher practice within my organization.		88.5% of stakeholder's were satisfied that the consortium PD opportunities influenced leadership and/or teacher practice

OUTCOMES GOAL TWO

Stakeholder Survey Results

PD facilitated by the Consortium supported effective implementation of curricula.				
2012-13	2013-14	2014-15	2015-16	2016-17
84%	100%	100%	100%	93.3%

Analysis of Outcomes of Goal Two

The high level of collaboration in Zone One allows for joint planning that meets the needs of multiple school districts, often at the same event. NRLC aims to work with PLC groups and other clusters of teachers, mindful of district calendars and other regional considerations. We are also noting greater capacity of districts to use their own staff and support them in PD roles. Student Learning Assessments (SLA) were available to a select group of jurisdictions and we had three (3) pilot districts in the third year of process. Alternate delivery and recording/caching of sessions for anytime/anyplace PD for teachers is also being utilized. NRLC consultants have been very intentional in promoting the outstanding on-line resources housed on the Alberta Regional Professional Development site (ARPDC) coordinated through staff with the Edmonton Regional Learning Consortium (ERLC). Over 20 new on-line resources were added in the past year, primarily videos with accompanying learning guides. The Mathematics in-service support (see Appendix C) is an important part of building sustainable leadership capacity. The Elementary Mathematics Professional Learning website is a key part of on-going support and the professional learning resources can be viewed at http://learning.arpdc.ab.ca the final report is included in Appendix D.

One of our goals is to provide opportunity for a variety of job embedded learning opportunities, designed in collaboration with educators at a school and district level. The design of PD is evolving to include the development of online learning opportunities that can be accessed by school based instructional leaders, coaches and individual teachers. Learning about how to design online learning includes experiences with developing video, archived webinar conversation guides and managing the production of these learning opportunities. This job embedded learning may involve the use of a variety of technology mediated learning opportunities, as well as direct mentorship and support for teacher coaches through cohorts. Our work with a Regional Cohort group is helping share and develop knowledge and practice and using provincially developed tools and learning guides. Peer learning and conversations across cohort groups continues to be time and

resources well invested as we bring new people into the groups and in some cases alumni staff go into central office curriculum support positions. Further detail and specific examples are provided in the NRLC support for mathematics report as Appendix C.

Further to the needs assessment completed by the Curriculum Facilitator the following priorities and work, as aligned with the Alberta Education priorities and the Jurisdiction 3 year plans guided by the Alberta Education Business plan, was identified and acted upon.

Supporting Competencies Goals:

- Plan and deliver Professional Learning sessions in **"Integrating the Competencies in PBL."** Work with districts/schools to build the sessions that are most required to meet their needs.
- Plan a Project Based Learning sharing session for the Jr. and Sr. High levels
- This will be a major focus area next year especially after reviewing the draft curriculum introduction and Scope and Sequence documents along with the CDMA application which brings in the competencies and progressions every effectively.
- Posters and learning guides have been updated through our ARPDC team and are available on the resources website (https://arpdcresources.ca)

Literacy Goals:

- Run a series in High Prairie and or Peace River - especially Jr High/Adolescent Readers
- Run a series in Early Literacy - Mid Literacy in Grande Prairie.
- Investigate catalyst facilitators: Joe Stouffer; Miriam Treharne, Pernille Ripp, for 2017-2018
- Note: four (4) sessions already booked with PRSD for Winter/Spring 2017

Student Learning Assessments

The April 2017 joint needs assessment identified formative assessment as highest priority need so we are planning to work with Ken O-Connor in November 2017 and other follow-up sessions as planned with Districts.

Diploma Programs

Work in progress to meet these needs. We hosted an excellent webinar on May 11, 2017 with a combination of face-to-face and Adobe connect participants and Alberta Ed presenters. The model was well received.

Curriculum Development

This was a new priority area for 16-17 and with the short time lines for support this fall it became the highest priority area. The Facilitator and or Executive Director met with all districts to design a specific plan for their district. We have received outstanding support for this work, with access to principal groups, leadership coaches and parent groups. The feedback on the curriculum survey results topped 30,000. In May/June of 2017 we had the opportunity to take out the draft scope and sequence documents on the six core subjects K-12. As the draft documents were shared, stakeholders and educators were able to see how the competencies were framed through essential understandings and questions and are now waiting to learn about the important implementation support process.

SAMPLE RESPONSES from *Competencies* sessions

An aspect of this learning opportunity that made it meaningful is:

✓ It was all applicable to our students and what we do daily.

✓ The chance to sit with grade level team and plan a project together. It was authentic instead of hypothetical like most PDs

✓ Very engaging session! Put into practice, provided a meaningful way to go about planning an effective project and to evaluate and asses it.

An aspect that might be improved:

- ✓ We need more time allocated to this PD to go deeper in some specific areas and class settings
- ✓ It was originally intended for 2 days and would have been nice to have the full two days to develop a project.

One thing I require to further support my professional learning on this topic is:

- ✓ I am very interested in the topic and will be seeking out other teachers to discuss their journey with implementing a project.
- ✓ I would have liked this PD earlier in the year. In order to do PBL, I would be incorporating so many outcomes that I have either already taught or won't be teaching until later. My year long plan was already made, and I'm not really willing to re-work that whole thing this year to incorporate a PBL, but next year for sure!
- ✓ Time to revise my project, with feedback.

FOLLOW UP SURVEY (completed approximately 30 days following the event)

Please share any comments on how you have increased awareness with colleagues:

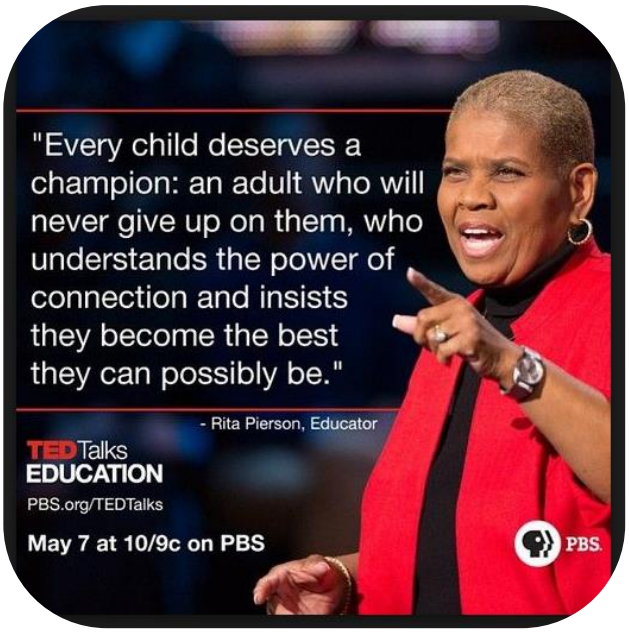
- ✓ I have shared the PBL projects I have done.
- ✓ We presented what we learned at staff meeting. We have also talked to colleagues about what we are doing with our own projects

Please describe what you did or tried since the learning opportunity:

- ✓ I have had my students write some questions about things we have been studying to judge the depth of their understanding.
- ✓ I created new rubrics for my PBL using the strategies learned. I also changed the essential question and re-modeled the project according to what we learned.
- ✓ I have worked to develop the project I am going to implement.

One thing I observed after applying the new learning with staff and students (observable result):

- ✓ I was able to better see the students who were just remembering something they learned, instead of really understanding and applying what they had learned.
- ✓ I used a video from the presentation and I liked it
- ✓ More discussion about PBL with staff



ARPDC Goal Three

Coordinate, broker, and act as a referral center to assist stakeholders to access available professional development resources.

Outcome 3.1

Collaborate with, share expertise and resources with, and secure the resources and services of other professional learning providers and stakeholders in the planning and developing professional learning opportunities for stakeholders (e.g., Early Childhood Coalitions, AAC, 2Learn, ATLE, Galileo, Alberta post-secondary institutions, ATA, TC2, CASS, 2Learn Society, RCSD)

Strategies Used to Achieve Goal Three

NRLC	ARPDC	Partners
• Identify regional learning needs that could be met by collaborating with professional learning providers and stakeholders.	• Identify provincial learning needs that could be met by collaborating with professional learning providers and stakeholders.	• Identify regional and provincial learning needs that could be met by collaborating with professional learning providers and stakeholders.
• Explore potential partnerships and collaboration opportunities with professional learning providers and stakeholders through discussions and meetings.	• Explore potential provincial partnerships and collaboration opportunities with professional learning providers and stakeholders through discussions and meetings.	• Explore potential partnerships and collaboration opportunities with stakeholder partners through discussions and meetings.
• Design learning opportunities with other professional learning providers to respond to regional needs.	• Design and deliver professional learning opportunities provincially that capitalize on the resources of partners.	• Design and deliver professional learning opportunities that capitalize on the resources of partners.

Outputs Goal Three

Performance Measures	Metrics	Results
Percentage of stakeholders accessing NRLC services that were satisfied	Survey of educational stakeholders	90.9% of district contacts accessing NRLC services were satisfied
Overall number of sessions provided through partnerships		• 14 LO / 282 S /5409 R
Number of Conferences/Symposiums supported through partnerships		• PWSD Google Summit • FVSD District PD Days (3) • Early Childhood Conference • Little Red River BOE & Treaty 8 Teacher Conference • Education Assistant Conference • FNMI Spring Gathering • GP Summer Numeracy

OUTCOMES GOAL THREE

Stakeholder Survey Results

The Consortium's coordinating, brokering and or referral services were effective in helping us access PD resources.				
2012-13	2013-14	2014-15	2015-16	2015-16
89%	100%	96.1%	100%	86.7%

Analysis of Outcomes of Goal Three

The Northwest Regional Learning Consortium is working diligently to meet the needs of Zone One stakeholders. It is evident by the number of professional learning opportunities held, the number of active grants, and the number of meetings that NRLC staff is involved in that we have increased our output to a great degree. We are pleased to report increased engagement and planning programs with Early Childhood Coalition partners. The expanding work as ARPDC provincial project leads continue to provide more access to quality learning programs.

There is an increasing expectation provincially that NRLC/ARPDC will partner, broker and plan collaboratively with a variety of PD providers beyond our ARPDC partners in order to develop coordinated and comprehensive learning opportunities across the province. Regionally, motivation to plan more cooperatively and collaboratively in order to share resources and establish learning communities that span districts is becoming more evident. NRLC will continue to actively support regional ATA Teachers' Conventions, Specialist Councils, and ATA locals by sponsoring presentations, providing information, and attending learning opportunities.

NRLC coordination, brokering and referral services are responsive to stakeholder needs. Our school jurisdictions each have specific challenges that can be met through collaboration with and through NRLC and long-term planning and commitment.

Challenges in Professional Development Learning Opportunity Attendance

As a consortium, we have reviewed best practices in adult learning, and investigated with our jurisdictions to design learning plans which will be responsive to the needs of individual teachers, schools, and jurisdictions, delivering professional learning in such a way as to create learning communities. We will continue to develop online professional development resources for educators, as appropriate, that allow for anytime, anyplace and any pace access to professional development. *The challenge continues to be support to use those resources and we will continue to work with Districts to build awareness and capacity. Our ability to deliver on district and PLC days is helping decrease the barrier of teacher away from the classroom and sustainable numbers for meaningful learning.*

Our ability to stretch PD resources has always been a challenge in the large geographical region NRLC serves. Travel costs to bring in presenters are higher than in central regions, and even regional access requires teacher travel and sub release. The use of technology remains a viable option, especially as districts move to the world of Google with trained staff who support directly within schools and classrooms. We will continue to offer more sessions at the district level and through PD days and conventions. The majority of our programming comes from specific requests and our ability to develop partnerships with other professional learning providers is very important. The ability for the ARPDC group to design appropriate provincial tours of catalyst expert speakers is welcomed in our region. The development of teacher-coaches is expanding the reach of curriculum specialists and will be part of our comprehensive planning. We keep encouraging our participants to provide feedback

through regular evaluation surveys and the 30 day feedback survey. We are more intentional in seeking feedback from our planning groups as well. We are making some progress in this area and truly use and value the feedback to know we are making a difference.

APPDC Goal Four

Deliver professional development based on the identified and emerging needs of educational stakeholders.

Outcome 4.1 Deliver professional development based on the identified and emerging needs of educational stakeholders.

Outcome 4.2 Work collaboratively with ARPDC to develop plans, strategies and opportunities to meet provincial identified needs in congruence with provincial direction.

Outcome 4.3 Work collaboratively with Alberta Education staff to develop plans, strategies and opportunities to meet provincial identified needs in congruence with provincial direction.

Strategies Used to Achieve Goal Four

NRLC	ARPDC	Partners
• Develop professional learning opportunities based on identified jurisdictional needs through various advisory committees.	• Work collaboratively with Alberta Education staff to understand provincial emerging needs.	• Work collaboratively with partners to understand regional emerging needs.
• Plan and develop a wide range of professional learning opportunities based on identified needs through the use of emerging technologies for adults to learn synchronously and asynchronously. (face to face, online, …)	• Work collaboratively with ARPDC to develop professional learning opportunities based on provincial emerging needs.	• Work collaboratively with partners to develop professional learning opportunities based on regional emerging needs.
• Identify feedback mechanisms to determine needs and impact of professional learning opportunities.	• Use a common post survey for administration to session participants to determine needs and impact of professional learning opportunities. • ERLC/ARPDC attend train the trainer meetings with Alberta Education staff to deliver accurate information in professional learning opportunities around the Alberta Education priority areas.	

OUTPUTS GOAL FOUR

Performance Measures	Metrics	Results
***All formats: face-to-face, webinars, communities of practice, video conferences, webcasts, wikis, websites, videos.**		
Number of learning opportunities (*all formats) that were planned and delivered to support identified and emerging needs of educational stakeholders.	Registrations received	124 learning opportunities / 570 sessions were planned and delivered 11,772 participants
Number of learning opportunities (all formats) that were planned and cancelled.	Planned sessions cancelled	20 learning opportunities planned and cancelled
Overall percentage of participants satisfied that they increased their awareness and/or deeper understanding of the topic.	*Professional Learning Reflection and Needs Assessment* *Distributed immediately following the learning opportunity. (#1)	92% satisfaction
Overall percentage of participants satisfied that they were provided strategies for integration of the learning into their current practice.	*Professional Learning Reflection and Needs Assessment* *Distributed immediately following the learning opportunity. (#3)	98% satisfaction
Overall percentage of participants satisfied that they were provided opportunities to reflect on their knowledge, skills and attributes about the topic.	*Professional Learning Reflection and Needs Assessment* *Distributed immediately following the learning opportunity.(#4)	100% of district contacts indicated satisfaction that NRC's PD offerings aligned with their identified plans and emerging needs Descriptions and testimonials noted throughout Annual Report.
Percentage of stakeholders satisfied that NRLC was effective meeting emerging PD needs, outside of those identified in planning documents.	Number of District Teams & Meetings	7 District Planning Teams 37 District Meetings held 124 learning opportunities/ 231 sessions were planned in collaboration with Zone 1 Districts 5737 participants
District Collaboration	Number of Collaborative Projects	Collaborative Projects Planned 76 LO's / 219 S / 4774 R

Always believe in kids and try different teaching techniques and methods to help improve the students' ability to learn. **- COMMENT FROM NRLC *Inclusive Education* SESSION**

OUTCOMES GOAL FOUR

Stakeholder Survey Results

The Consortium was effective in helping us meet emerging PD needs, outside of those identified in our planning documents.				
2012-13	2013-14	2014-15	2015-16	2016-17
89%	100%	100%	100%	93.8%

Analysis of Outcomes of Goal Four

The Northwest Regional Learning Consortium tracks district requests and participation through internal reports which gives a clear indication that identified and emerging needs of educational stakeholders are being met.

Districts request sessions using distributed learning technology when a key expert is not available to come to the region. Follow-up webinars have been offered with limited success. These sessions help alleviate travel and time considerations for teachers attending PD. NRLC is working to provide leadership to districts. Teachers are experiencing the power of collaboration through Moodle, Google and Wiki sites. Linking and working with teachers in another part of the province or world is a common occurrence.

The NRLC will enhance and continue to explore a more coordinated, collaborative and comprehensive approach to informing and planning professional learning. The development of shared learning guides to support initiatives across the province is working well. Supporting and coordinating programming opportunities with local district teams, ATA specialist councils, and ATA Convention Boards will continue to be a priority. The Executive Director values the opportunity to meet regularly with District staff to understand, plan and co-create professional learning opportunities to support the Programs of Study and Alberta's vision for education.

Alberta's ongoing curriculum update and refresh process will continue to call out for the development of more inquiry-based learning and critical thinking skills as both instructional and learning tools. We will work with our Districts and Alberta Education to design learning frameworks and opportunities to support the development of the competencies and intentionally embed them into our revised programs of study and professional learning opportunities. We are working hard to align plans and priorities through sustained focus and support to our jurisdictions. These plans and goals ultimately impact student learning. Participants indicate they are satisfied that NRLC is meeting their professional learning needs, building teacher capacity and having an impact on student learning.

NRLC continues to support and promote availability of embedded professional learning opportunities that are accessible to teachers in a variety of ways based on feedback from educators regarding preferred methods of learning. Our updated website has a section titled 'Learning Room'. It is our intention to provide more

embedded learning tools and support with our various consultants and Curriculum Facilitator in this space in the 2017-2017 program year. We are also looking forward to more direct curriculum support through the recruitment of a NRLC Curriculum Facilitator for the 2017-2018 school year.

SAMPLE RESPONSES from *Assessment* sessions

An aspect of this learning opportunity that made it meaningful is:

- ✓ It was beneficial to see that statistics and process for determining diploma exam questions, to see the testing that is done, to demonstrate that they do have some validity as a form of standardized assessment.
- ✓ Provided a clear understanding of what is expected out of classroom based assessments on Diploma courses so that the grades are comparable.
- ✓ Handouts. Background information provided. Context of the decision making. Meeting the people who make it happen.
- ✓ It's a good networking opportunity and lets teachers know better how the diploma assessment development process works.
- ✓ The small group so discussion was great and we got our questions answered!
- ✓ We had lots of opportunity to work together and ask questions.

An aspect that might be improved:

- ✓ Sorry, I am drawing a blank here. It was way better than what I expected.
- ✓ Provide more time for schools to work together to analyze their individual exam results to see where there are trends that can be improved upon on the school level.
- ✓ taking the next step - what to do about targeting the differences in school results and diploma results
- ✓ A short practice session on "item writing."

One thing I require to further support my professional learning on this topic is:

- ✓ A connection to what first year post-secondary students will actually need to be successful in Math/Sciences. Is there a seamless transition from high school to post-secondary education? Does the diploma take this into consideration? What can we do to make them be even more successful? Are we making enough allowances to help students who don't learn and examine in the “regular” manner be successful as well?
- ✓ PLC time within the departments of our individual schools to come up with strategies for common assessment, and moving forward
- ✓ How do have effective assessment practices with reasonable time constraints in school?

Click to see our PD Calendar for the current year

ARPDC Goal Five

Promote and support the development of professional development leadership capacity.

Outcome 5.1 Develop collaborative learning opportunities in the following areas with a focus on building leadership capacity within: • First Nation, Métis and Inuit • Mathematics • Supporting Competencies in Current Curriculum • Supporting Literacy and Numeracy in Current Curriculum • Provincial Assessments – Student Learning Assessments • Provincial Assessments – Diploma Programs • Inclusive Education • Career and Technology Foundations • Learning Commons Policy • Curriculum Development
Outcome 5.2 Develop collaborative learning opportunities to augment leadership capacity in support of emerging jurisdictional needs.

Strategies Used to Achieve Goal Five

NRLC	ARPDC	Partners
• Identify jurisdictional needs through various advisory committees.	• Work collaboratively with Alberta Education staff to understand provincial emerging needs.	• Work collaboratively with partners to understand regional emerging needs.
• Plan, develop and facilitate a wide range of professional learning opportunities and/or resources based on identified needs.	• Work collaboratively with ARPDC to plan and develop professional learning opportunities and/or resources based on provincial emerging needs.	• Work collaboratively with partners to develop professional learning opportunities and/or resources based on regional emerging needs.

Outputs Goal Five

Performance Measures	Metrics	Results
Percentage of stakeholders satisfied that the Consortium has contributed to the development of PD leadership capacity. (DC#6)	Survey of educational stakeholders	90.5% of stakeholders responded that they were satisfied with the efforts of NRLC to develop professional development leadership capacity in a number of areas.
Number of sessions provided for developing leadership capacity	Registrations	5 LO / 52 S / 1014 R
Number of learning sessions to support identified emerging jurisdictional needs.	Registrations	13 LO / 41 S / 721 R

OUTCOMES GOAL FIVE

Stakeholder Survey Results

The Consortium has contributed to the development of PD leadership capacity within my organization.				
2012-13	2013-14	2014-15	2015-16	2016-17
84%	100%	100%	90.5%	88.5%

Analysis of Outcomes of Goal Five

NRLC completed a joint needs assessment with the ATA in 2009, 2011, and 2013. We have held off for the next bi-annual period based on advice from our region on getting clarity on curriculum direction before proceeding. We offered a revised needs assessment in spring of 2017. We reported the results of those finds on page 29-30 and they closely align with Alberta Education priorities. Districts continue to build capacity with learning/instructional coaches through collaborative projects and planning. Our work with the Literacy/Numeracy regional cohort group continues to support leadership capacity as well. The work with Curriculum engagement helped everyone see the principal as the instructional leader and the Curriculum Guiding Framework document provides clear information and mileposts to follow on the process and expected outcomes. Some of our Districts are preparing to support their school based leaders by providing support in instructional leadership necessary to support the educational transformation through the seven competencies outlined in Alberta Education's Principal Quality Practice standards. NRLC will continue the conversation with our districts in the coming year.

SAMPLE RESPONSES from *Leadership* sessions

An aspect of this learning opportunity that made it meaningful is:

✓ Collaborative opportunity with other professionals in the community. It helped to get people on the same page about protocols in the Grande Prairie area.

✓ It was highly applicable and practical. I felt like I could follow it well and could connect it to both current and future/desired practice.

One thing I require to further support my professional learning on this topic is:

✓ It was a presentation that reaffirmed my belief that we are on the right track when recruiting new staff members.

✓ I liked how things ended and wish I could have more time to spend on that kind of reflection and planning of how to start the PLCs, but once they get started, they will provide that kind of time themselves.

SAMPLE RESPONSES from *Professional Learning Reflection Survey (30 days following Learning Opportunity)*

Please describe what you did or tried since the learning opportunity

✓ Actually participated in a VTRA meeting the very next week.

One thing I observed after applying the new learning with staff and students (observable result):

✓ I use behavioural questioning during all interviews I am involved in.

ARPDC Goal Six

Provide stakeholders with access to professional development at a reasonable cost. Consortia offer programs at a reasonable cost.

Outcome 6.1 Consortium will provide professional learning opportunities at a reasonable cost to participants.

Strategies Used to Achieve Goal Six

NRLC	ARPDC	Partners
• Budget funds from grants to off set participation costs for learning opportunities.		
• Make fiscally sound decisions regarding operating costs for Consortium.		• Collaborate with stakeholders to provide services.
• Develop fiscally sound processes to manage grant funds.	• Distribute grant dollars in support of learning through transparent formulas exhibiting fair and equitable distribution.	

Outputs Goal Six

Performance Measures	Metrics	Results
Percentage of stakeholders agreeing that services are provided at a reasonable cost	Survey of stakeholders (#7)	100% of district contacts were satisfied that NRLC met this goal.
Percentage of stakeholders agreeing that NRLC provided good value for the grant dollars they were proved to support implementation of curricula	Survey of stakeholders (#4)	100% of district contacts agreed or strongly agreed that this performance measure was met.
Percentage of session participants agreeing that the session cost was reasonable	*Professional Learning Reflection and Needs Assessment* distributed electronically or in hard copy following each event. (#5)	99% of program participants were satisfied that session costs were reasonable

Financial Sustainability

We welcome a major shift in curriculum support sustainability through the direction that will be provided in the 2016-2017 funding manual Section 6.21. The ability to plan over an extended period of time and hire contractors or secondments to meet the priorities significantly improves our service to our region and the province.

We continue to explore other opportunities where teachers are gathered (Teachers' Conventions, ATA Specialist Council Conferences) to provide quality professional development.

OUTCOMES GOAL SIX

Stakeholder Survey Results

The Consortium provided good value for the grant dollars they were provided to support implementation of curriculum.				
2012-13	2013-14	2014-15	2015-16	2016-17
89%	100%	96.1%	100%	96.7%
The Consortium services are provided at reasonable cost.				
2012-13	2013-14	2014-15	2015-16	2016-17
89%	100%	100%	100%	100%

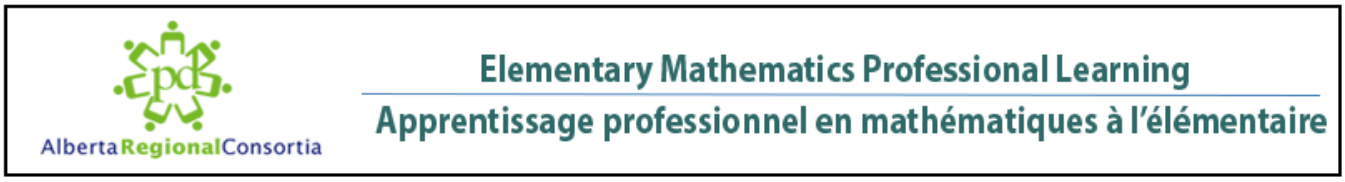
Analysis of Outcomes of Goal Six

NRLC strives to provide access to sessions in locations where usually at least three jurisdictions would be within a two hour drive. Webinars are developed provincially or with other educational stakeholders and the virtual access is well received although many are after school. Delivery of learning opportunities using technology requires greater preparation, organization, technical support and equipment testing on the part of the presenter and organizers. The best programming happens when the district and/or school can have the professional learning opportunity or expert available in their time and place-whether that is a district PD day or PLC scheduled time.

Northwest Regional Learning Consortium and the Management Team, is committed to the provision of technology mediated learning and technology implementation support for our teachers. The NRLC office staff have grown in their ability to support Adobe Connect, Skype, and Google Hangout. School jurisdictions in our region and, indeed, Alberta Education have come to expect and even rely on the availability of technology mediated learning options and technology support for implementation.

NRLC provides professional development at a reasonable rate through grant allocation and district collaboration and on occasion as a full cost-recovery learning opportunity.

NRLC as ARPDC Grant Lead



Elementary Mathematics Professional Learning Project 2015-2017

The Alberta Regional Professional Development Consortia and other partners have been working to ensure K-6 education stakeholders have a shared understanding of the expectations of the mathematics program of studies.

Since the beginning of the 2015-2016 school year, a series of instructional and collaborative professional learning experiences have been offered through provincial webinars, regional opportunities, and a variety of technology mediated resources. These experiences are designed to enhance:

- Teacher understanding of mathematical content and conceptual relationships
- Formative and summative assessment practice
- Development of pedagogical fluency related to student learning
- Teacher-parent communication

The aim of this series of instructional and collaborative professional learning experiences is to provide opportunities, ideas, and a venue for teachers to work collaboratively to enhance and further develop their Professional Capital (as described by Fullan and Hargreaves, cited in A Great School for All - ATA, 2012).

Guiding Questions for educators to consider

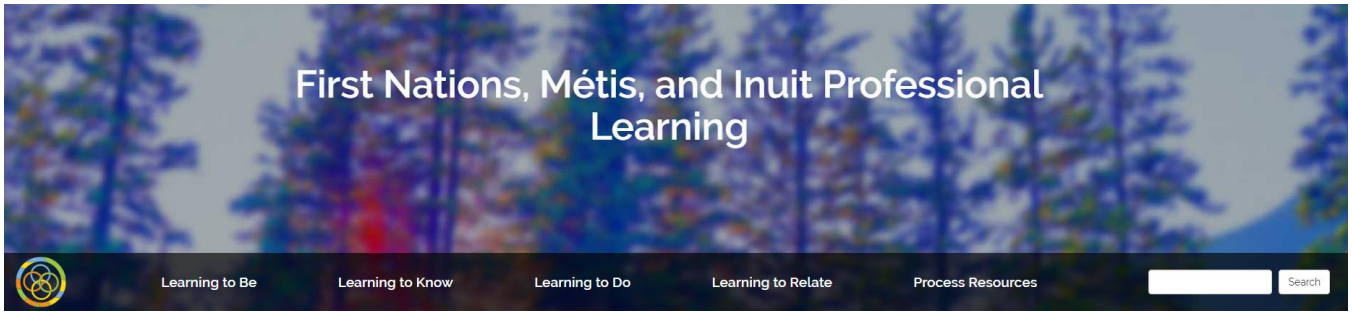
- What do I want my students to learn? (based on the Alberta Program of Studies)
- How will I know, track, evaluate, and communicate how well they are learning it?
- What activities, resources, and structures will I select to further student understanding?

Extending the EMPL Learning Opportunity

- Resources being created are meant to support follow-up learning opportunities where teachers will continue the conversation and have the opportunity for deeper and more personal reflection. Teachers will be invited to work collaboratively to develop instruction that:
  - addresses the desired content (skill and knowledge) outcomes,
  - determines the degree of mastery and fluency that students should be able to show,
  - chooses appropriate resources and design learning activities to help their students develop their mathematical skills,
  - evaluates the success of those activities in promoting student growth.

Information Sheet

ARPDC Website (click for links to content)



Provincial First Nations, Metis, and Inuit Professional Learning Project 2013-2017

The purpose of the ARPDC project is to provide leadership and support for Alberta Schools across the province to implement specific strategies related to the FNMI Program of Studies. Over 2016-17 a new and comprehensive website has been established to share the findings, and to support educators in Alberta, and elsewhere in the country and world.

The First Nations, Métis, and Inuit Professional Learning website provides educators with supports and tools to design and facilitate professional learning. It offers curricular resources that build capacity, engage learners, and build paths toward reconciliation through education. This website supports individual educators, cohorts, school communities, and entire school authorities. It highlights promising practices and features an extensive digital resource base through Moodle and Google platforms.

The **How and When to Use this Website Learning Guide** highlights the features of this website and stimulates learning, conversation, critical reflection, and the development of implementation approaches and strategies.

Final Report and Guiding Documents

ARPDC Website (click for links to content)

Introduction to Appendices

The following reports represent the business aspect of the Northwest Regional Learning Consortium. NRLC makes every attempt to act upon, and report upon the grant deliverables as designated by Alberta Education.

A. **NRLC 2016-2017 Audited Financial Statements**
The audited financial statements are a complete and accurate reflection of the ongoing business operation NRLC. We continue to provide and act on accurate budget data, and strive for reasonable program costs.

B. **NRLC 2016-2017 Mathematics, Numeracy and Literacy Report**
A summary report of the work completed under the umbrella of Mathematics, and Numeracy and Literacy under the Curriculum Implementation Grant in the 2016-17 year. This summary report is provided by Geri Lorway of Thinking 101, Math Consultant for NRLC.

C. **Elementary Mathematics Professional Learning Report**
A summary report of the work completed under the provincial grant in co-leadership with the Central Alberta Regional Consortium and the Consortium Provincial Francophone.

Celebrating Over 20 Years of Learning

Stay informed and current with what the NRLC has going on in the North!
Everything from our latest News and Social Media feeds to our latest Newsletter.

NRLC

TRENDING AT NRLC

Read the blog and newsletter, Follow social media conversations and more!

CHECK IT OUT >

Alberta Government

Regional Consortium
Statement of Revenues and Expenses
For the Year Ended August 31, 2017 (in dollars)

CONSORTIUM NAME: Northwest Regional Learning Consortium

	Budget 2016/2017	Actual 2016/2017	Actual 2015/2016
REVENUES			
Alberta Education:			
Management & Infrastructure **(Note 1)***	191,987	191,987	191,987
Net Conditional Grant Revenues:			
Provincial Programs **(Schedule 1)**	329,925	558,993	982,039
Regional Programs **(Schedule 1)**		-	313,904
Fee For Service Contracts **(Note 2)**			
Other Alberta Education			
Total Alberta Education	521,912	750,980	1,487,930
Other Revenue:			
Conditional Program Registration Fees:			
Provincial Programs **(Schedule 1)**	45,000	81,559	
Regional Programs **(Schedule 1)**		28,097	56,641
Grants - Non government sources **(Note 3)**			
Cost Recovery Programs: **(Note 5)**			
Registration Fees **(Schedule 4)**		3,300	12,187
Other fees **(Schedule 4)**	14,710	33,420	15,836
Other **(Note 4)**:			
Transfers from Other PDC	56,270		
(Specify)			
(Specify)			
TOTAL REVENUES	637,892	897,356	1,572,594
EXPENSES			
Management & Infrastructure (Note 6):			
Salaries, Wages, Benefits, Contracts and other fixed overheads **(Note 7)**	336,573	316,829	315,311
Board expenses **(Note 8)**	3,000	1,158	1,681
Less: Program Cost Allocations **(Note 9)**	147,586	124,442	122,005
Net Management & Infrastructure expenses **(Note 9)**	191,987	193,545	194,987
Program Delivery Costs (Note 10):			
Conditional programs:			
Provincial Programs **(Schedule 1)**	442,455	840,552	982,039
Regional Programs **(Schedule 1)**	2,000	28,097	370,545
Cost Recovery Programs **(Schedule 4)**	1,450	36,720	28,023
Other:			
Fee for Service Contracts			
Accounting and Audit Fees			
(Specify)			
(Specify)			
(Specify)			
TOTAL EXPENSES	***637,892***	***898,914***	***1,575,594***
ANNUAL SURPLUS (DEFICIT)	-	***(1,558)***	***(3,000)***
Accumulated Surplus at beginning of year	14,461	14,461	17,461
Accumulated Surplus at end of year	***14,461***	***12,903***	***14,461***

* *See notes to Forms 1 and 2 on page 7 and 8.*

PLEASE **RETURN** hard copies of completed statements and schedules and the certification to:
Allan Pon c/o School Finance Branch, 8th floor, Commerce Place, 10155-102 Street, Edmonton T5J 4L5
BY DECEMBER 31, 2017

Alberta Government

Regional Consortium
Statement of Financial Position
As at August 31, 2017 (in dollars)

CONSORTIUM NAME: Northwest Regional Learning Consortium

	August 31, 2017	August 31, 2016
ASSETS		
Cash in Bank and Temporary Investments	174,977	368,447
Accounts Receivable **(Note 11)**:		
Province of Alberta		
Alberta school jurisdictions	68,608	50,949
Other		
Prepaid Expenses (e.g. deposits for future programming)	28,495	11,497
Other assets		
TOTAL ASSETS	***272,080***	***430,893***
LIABILITIES		
Accounts payable **(Note 12)**	35,592	5,890
Accrued liabilities **(Note 12)**		
Deferred Revenue:		
Conditional Grants:		
Provincial Programs **(Schedule 3)**	142,735	345,324
Regional Programs **(Schedule 3)**	34,014	26,478
Prepaid registration **(Note 13)**	46,836	38,740
Other:		
(Specify)		
(Specify)		
Total Deferred Revenue	223,585	410,542
TOTAL LIABILITIES	***259,177***	***416,432***
ACCUMULATED SURPLUS		
Unrestricted Funds **(Note 14)**	12,903	14,461
Operating Reserves **(Note 15)**		
Capital Reserves **(Note 16)**		
TOTAL ACCUMULATED SURPLUS (Note 17)	***12,903***	***14,461***
TOTAL LIABILITIES AND ACCUMULATED SURPLUS	**272,080**	**430,893**

Alberta Government

Schedule 1 (Note 5, Note 10)
Conditional Grant Program Costs and Net Grants Revenue
For the Year Ended August 31, 2017 (in dollars)

CONSORTIUM NAME: Northwest Regional Learning Consortium

	2016/2017					
	Cost of Delivering Programs (Note 7) Allocated (Note 18)	+ Cost of Delivering Programs (Note 7) Incremental (Note 19)	= Total Cost of Delivering Programs	- DEDUCT: Program Registration Fees Note (a)	= Net Conditional Grant Revenue
Conditional Grant Programs:					
Provincial Programs					
	-		-		-
	-		-		-
	-		-	-	-
Curriculum Implementation	-	295,228	295,228	81,559	213,669
Provincial FNMI PD strategy #2014-0039		103,105	103,105		103,105
Elementary Mathematics Professional Leave		242,219	242,219		242,219
(Specify)			-		-
(Specify)			-		-
(Specify)			-		-
(Specify)			-		-
(Specify)			-		-
(Specify)			-		-
(Specify)			-		-
(Specify)			-		-
(Specify)			-		-
(Specify)			-		-
Total:	-	640,552	640,552	81,559	558,993
Regional Programs					
Caribou Conference		16,097	16,097	16,097	-
Horse Lake Band		10,000	10,000	10,000	-
ATA PD		2,000	2,000	2,000	-
Education for Reconciliation			-		-
High School Completion			-		-
Mental health Matters			-		-
(Specify)			-		-
(Specify)			-		-
(Specify)			-		-
Total:	-	28,097	28,097	28,097	-

Notes to Schedule 1:

a. Registration Fees are to be applied to the costs of delivering conditional programs and must be net of registration refunds.

Alberta Government

Schedule 2

Conditional Grant Transfers - (Provincial) to Other Consortia: Note 9

For the Year Ended August 31, 2017 (in dollars)

CONSORTIUM NAME: Northwest Regional Learning Consortium

	Amount Transferred 2016/2017 Note (b)
Elementary Mathematics Professinal Learning 2014-0141	
Central Alberta Reg Consortium	
Francophone PD Consortium (CPFPP)	
Edmonton Regional Learning Consortium	
Learning Network Ed Services	
Calgary Regional Consortium	
Southern Alberta PD Consortium	
(Specify Consortium)	
Program Total Elementary Mathematics Professinal Learning 2014-0141	-
Provincial FNMI PD Strategy #2014-0039	
Southern Alberta PD Consortium & Calgary Regional	10,560
Francophone PD Consortium (CPFPP)	2,010
Edmonton Regional Learning Consortium	7,890
Learning Network Ed Services / Central Alberta PD	6,450
Program Total Provincial FNMI PD Strategy #2014-0039	26,910
(Specify Program)	
(Specify Consortium)	
(Specify Consortium)	
(Specify Consortium)	
(Specify Consortium)	
Program Total (Specify Program)	-
(Specify Program)	
(Specify Consortium)	
(Specify Consortium)	
(Specify Consortium)	
(Specify Consortium)	
Program Total (Specify Program)	-
(Specify Program)	
(Specify Consortium)	
(Specify Consortium)	
Program Total (Specify Program)	-
Total transfers to Other Consortia	26,910

Notes to Schedule 2:

a. Excluding payments for cost recoveries. Include cost recoveries in *Program Delivery Costs* on page 1.

b. Program Totals are reported in Schedule 3 and are deducted in arriving a *Deferred*

Alberta Government

Schedule 3
Conditional Grant Program Deferred Revenue
For the Year Ended August 31, 2017 (in dollars)

CONSORTIUM NAME: Northwest Regional Learning Consortium

Conditional Grant Programs: Note (e)	2016/2017 Deferred Revenue from Previous Year Note (a)	+ ADD: Conditional funds invoiced to other Consortia	+ ADD: Current Year Receipts and Transfers-In Note (b)	- DEDUCT: Conditional Grant Transfers to Other Consortia (Schedule 2)	- DEDUCT: Net Conditional Grant Revenue Note (c) (Schedule 1 and Page 1)	= Deferred Revenue: Conditional Grants Note (d) (Page 2)
Provincial Programs						
0					-	-
0					-	-
0					-	-
Curriculum Implementation			356,404		213,669	142,735
Provincial FNMI PD strategy #2014-0039	103,105				103,105	-
Elementary Mathematics Professional Lear	242,219				242,219	-
(Specify)					-	-
(Specify)					-	-
(Specify)					-	-
(Specify)					-	-
(Specify)					-	-
(Specify)					-	-
(Specify)					-	-
(Specify)					-	-
(Specify)					-	-
(Specify)					-	-
(Specify)					-	-
(Specify)					-	-
(Specify)					-	-
Total:	345,324	-	356,404	-	558,993	142,735
Regional Programs						
Caribou Conference					-	-
Horse Lake Band					-	-
ATA PD					-	-
Education for Reconciliation			24,700		-	24,700
High School Completion			2,866		-	2,866
Mental health Matters			6,448		-	6,448
(Specify)					-	-
(Specify)					-	-
(Specify)					-	-
Total:	-	-	34,014	-	-	34,014

Notes to Schedule 3:

a. Total will agree to Page 2 *Deferred Revenue: Conditional Grants* for the previous year and the previous year's Deferred Revenue Schedule.

b. Where necessary, the Alberta Education conditional grant manager should be contacted for approval to transfer deferred revenue from the original approved

c. Net Conditional Grant Revenue will correspond to Schedule 1 and Page 1.

d. Deferred revenue represents unexpended funds that will be expended on programs or transferred to other consortia next year.

e. Conditional Grant Program names should match Schedule 1.

Alberta Government

Schedule 4
Cost Recovery Programs - Revenues and Costs: Note 3
For the Year Ended August 31, 2017 (in dollars)

CONSORTIUM NAME: Northwest Regional Learning Consortium

Program:	Registration Fees 2016/2017	+	Other Fees 2016/2017	-	Costs (Note 18, Note 19) 2016/2017	=	Annual Surplus 2016/2017
							-
							-
MF With High School Redesign			3,858		3,858		-
Closing the Achievement Gap (ERLC)			2,000		2,000		-
OLEP French Programming SAPDC	3,300		24,570		27,870		-
Curriculum Coordinators			2,992		2,992		-
							-
							-
							-
							-
							-
							-
							-
							-
							-
							-
							-
							-
							-
Program Total	3,300		33,420		36,720		-

Notes to Schedule 4:

a. Includes payments for grants held by other Consortia. Cost Recovery Expenses are included in the Cost of Delivering Conditional Programs in schedule 1.

Alberta Government

Certification of Regional Consortium Financial Statements For the Year Ended August 31, 2017 (in dollars)

CONSORTIUM NAME: Northwest Regional Learning Consortium

I certify that to the best of my knowledge, the information provided in the attached statements, notes and schedules is correct.

Chair of Consortium (Signature)

Dec 21 /2017

Date

Financial Officer (Signature)

Dec 21, 2017

Date

NOTES TO FORMS 1, 2 AND SCHEDULES

Note 1 Management and Infrastructure grant from Alberta Education (total amount received for the year).

Note 2 Alberta Education pays consortia for services provided under certain contracts/agreements.

Note 3 E.g. grants and subsidies from private partnerships (e.g. Shaw).

Note 4 Funding from other provincial government departments or the Federal government; bank interest, conference and cost recovery program registration and other cost recovery revenue, and operational fees recovered from other consortia.

Note 5 Cost Recovery Programs are Programs that are not supported through Conditional Grants. Such programs are funded through provincial or regional registration fees and other fees.

Note 6 Costs of operating and maintaining the consortium office.

Note 7 Including Office Staff (Executive Director, Executive Assistant and other office staff). Fixed overheads include office space, utilities, and office supplies. These are indirect costs that benefit all programs. Where Office Staff work on a particular program or, for example where leased space is used to deliver programs, these costs should be allocated to programs. Purchases for equipment used primarily for office overhead (e.g. photocopiers), some of which should be allocated to programs (See Note 18), should also be charged to management and infrastructure expense.

Note 8 Including meeting fees, supplies, travel and subsistence and board development.

Note 9 ENTER AS POSITIVE: Program cost allocations are M&I (Head Office) expenses that have been charged to conditional grant or cost recovery progams because the program benefited directly from M&I employee time or other overheads. (Where M&I expenses benefit all or many programs equally (indirect benefit) these costs should not be allocated to programs). The entry to charge M&I expenses to programs is Dr. Program costs (by program); Cr. Program cost allocations. This method will leave all M&I expenses, whether allocated or not, on the Note 7 expense line. It is hoped that "Net Management & Infrastructure" expenses (i.e net of program cost allocations) will be less than or approximately equal to the M & I grant from Education.

Note 10 Program delivery costs include part-time staff and contracted coordinators or consultants (e.g. program host, presenters, registration staff), and other direct costs including materials, site, audio-visual, catering, leased space, equipment used primarily for conditional programs, etc. Equipment costs attributed to more the one program (e.g. video conferencing) should be allocated to programs proportionate to other program costs. These are direct costs that can be attributed to programs. These costs do not include amounts transferred to other consortia, but do include costs invoiced to other consortia.

Note 11 Amounts owed to the consortium at the end of the year.

Note 12 Unpaid balances pertaining to the year. E.g. Unpaid wages, vacation pay.

Note 13 Pertaining to programming planned for subsequent year(s).

Note 14 Unrestricted Funds represent the net assets (total assets minus total liabilities) less any operating or capital reserves for earmarked programming.

Note 15 Funds earmarked for future operations or programming.

Note 16 Capital Reserves represents the net assets restricted for future capital expenditures.

Note 17 Total Accumulated Surplus is the total of operating and capital reserves and unrestricted funds.

Note 18 Allocated costs are M&I costs that directly benefit a specific conditional grant or cost recovery program controlled by the consortium and that have been credited to Program Cost Allocations (see Note 9). Allocated costs are funded by registration fees, conditional grants, or other cost recovery fees.

Note 19 Incremental costs are out-of-pocket expenses attributable to specific programs controlled by the consortium, also funded by registration fees, conditional grants or other cost recovery fees. They include costs incurred by participating consortia and reimbursed to them. These other consortia net thier reinbursement agaisnt their initial expense, thereby zeroing out the expense. This eliminates the duplication of expenses. Where other consortia bill an administration fee in addition to their out-of-pocket costs, miscellaneous revenue should be credited with that portion of the reinbursement.

Alberta Regional Consortia

Coordinated, Collaborative, Comprehensive Provincial Professional Development Leadership

The Alberta Regional Professional Development Consortia (ARPDC) is the term regional consortia use to highlight collective provincial "adult learning for students' sake" learning opportunities.

The system of Alberta regional professional development has operated since the mid 1990's with considerable success and has grown both in quality, influence and impact on educators across the province as an exemplary model for effective and efficient delivery of professional development to various education stakeholder groups based on common Consortia goals:

- to **facilitate** professional development which supports the effective implementation of components of:
    - the Alberta Education Business Plan
    - Jurisdiction and school education plans
    - Regional School Council priorities
- to **facilitate** professional development which supports the effective implementation of curricula, including instruction, assessment, and student learning outcomes,
- to **coordinate, broker, and act** as a referral centre to assist stakeholders to identify available professional development resources,
- to **deliver** professional development based on the identified and emerging needs of educational stakeholders,
- to **promote and support** the development of professional development leadership capacity, and
- to **provide** educational stakeholders with access to professional development at a reasonable cost.

The ARPDC is representative of the collective work of the seven Executive Directors and their teams, who report to their respective boards and provide service to school authorities across designated regions.

ARPDC provides in-person, as well as synchronous and asynchronous, technology-mediated learning opportunities to support adult learning, relying on consultation from the region to ensure professional development program designs support participants' and school authorities' context. Programs are based on our expertise and knowledge of effective professional learning design and delivery, aligned with the Alberta Programs of Study and are research sound.

Supporting Professional Learning through Technology

Online Learning Opportunities

Through 2016-2017, Alberta educators continued to access learning opportunities as a result of technology tools that facilitated the distribution of learning. Online learning opportunities were provided via a variety of platforms, principally: Adobe Connect Webinars, Google Hangouts, and Skype.

NEW

A new addition to this year's professional learning opportunities through technology was a series of **eCourses!** Two modules were offered: Module one - **What are Literacy & Numeracy?** Module 2 - **Literacy & Numeracy Progressions**. Stakeholders in education were invited to explore the meaning of literacy and numeracy, and, equally as important, engage in collaborative conversations about how to effectively integrate them into their respective Program of Studies. Participants were offered the option to earn a Certificate of Completion or to simply browse the content and materials provided at their leisure. The feedback was unanimous that this form of e-learning, open 24 hours a day/ 7 days a week, meets the need of our educators' busy lifestyles.

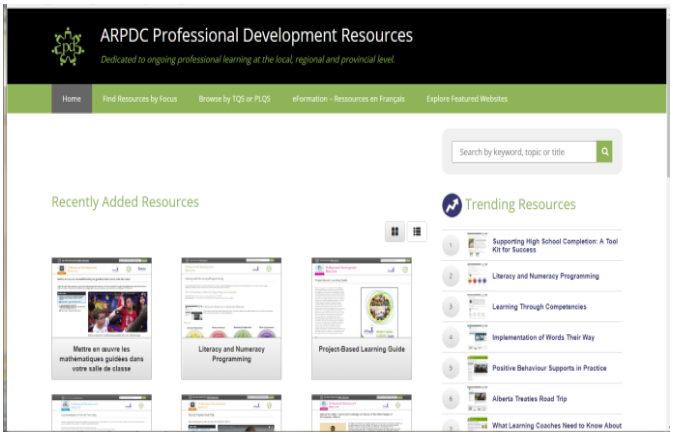
Synchronous		
Webinars	134 online learning opportunities	3585 synchronous participants 424 views of archived webinars
eCourses	2 learning modules	304 participants

Meetings

Technology support for meetings is essential to Consortia members. Adobe Connect, Skype and Google Hangouts are ways we connect and support district contacts, Alberta Education staff and our many partners.

Access to Resources

A provincial ARPDC Learning Portal has been active for seven years and houses many opportunities for educators to find a variety of resources, strategies and ideas for implementation of the Alberta curriculum. http://learning.arpdc.ab.ca



As well, to assist educators with implementation of curriculum, ARPDC develops professional development resources to provide ongoing, job-embedded support to nurture the growth of all educators and "*continue the conversation*" across the various priority areas.

These “made in Alberta” resources include videos and learning guides, archived webinars, facilitator guides, and a collection of resource websites. www.arpdcresources.ca

ARPDC Resources
Over 55,000 page views for online resources
Collectively over 500 free online professional resources in the form of videos and accompanying learning guides exist through the ARPDC resource page.

Provincial Projects

Elementary Mathematics Professional Learning

The second year of this project focused on continued updates to resources, links to research and curriculum clarifications. A presentation section was added in order to support presenters when speaking about these topics. The activities provided within these presentations were also added to the resource section of the applicable topics.

French translations for all resources and activities occurred concurrently with the development of all documents.

The Elementary Mathematics Professional Learning project, the Learning Portal and all of its resources were shared throughout the province during sessions, conversations and social media. Throughout 2016-17 a total of:

Elementary Math Professional Learning
Regional Follow-up and support was offered to 3810 participants.
Access to the resources on the learning portal saw a 49% increase over 2015-16 with 33,725 participants accessing the site.

Official Languages in Education Programs Grant

ARPDC is in its fourth year of a five year grant. Each year, $210,000 is divided through a distribution formula to each individual consortia to provide support for French Instruction. The six* regional consortia throughout the province planned and implemented professional learning opportunities in collaboration with their school stakeholders representing the "French" communities in each geographic region of Alberta. While each consortia offered specific opportunities to meet the needs of their individual communities, there were many similarities throughout the province. While specific professional learning opportunities are offered and sponsored by one consortium, they are also advertised and open to all interested teachers throughout the province. Certain geographic regions have limited numbers of French Immersion programs and FSL teachers; placing those individual teachers at a disadvantage if they were not provided the opportunity to attend and become involved in professional learning offered by all provincial consortia. Throughout the 2016 – 2017 school year, 104 learning opportunities were sponsored with 2,413 participants registered. 10 professional learning opportunities were cancelled in 2016 - 2017 due to limited registered participants.

*the seventh regional Consortium (Francophone) is not included in this grant

Mental Health Matters Grant

This project is to support the implementation of the Government of Alberta resource, Working Together To Support Mental Health in Alberta Schools. Under the leadership of CRC and ERLC, the focus of the work in 2016-17 was the conception and design of professional learning opportunities and resources in partnership with stakeholders to effect systemic change. The emphasis is on mental health practices to support learners at all levels of a tiered intervention system and collaborative procedures for collective impact. A Train-The-Trainer model will be initiated through ARPDC and across all regions in 2017-18.

High School Completion Tool Kit Grant

This project is to create and provide professional learning related to the implementation of a Tool Kit to support high school completion for youth who have left school or are at risk of leaving school. Under the leadership of the CRC, Learning Guides, exemplar PowerPoints, and a Quick Reference Guide highlighting the sections and contents of the Tool Kit have been developed and will be shared out for local use. This resource is currently available on the ARPDC website offering schools the opportunity to explore the resource together. A Train-The-Trainer model will be initiated in 2017-18 through ARPDC to support key contacts in delivering professional learning about the resource regionally. Provincial opportunities to raise awareness of the resource, including webinars and learning opportunities at events like the MFWHSR Fall Collaborative will occur as well.

Education for Reconciliation Grant

As members of the Joint Commitment to Action in Alberta, the Calgary Regional Consortium (CRC) and the Edmonton Regional Learning Consortium (ERLC), received a grant from Alberta Education to support Albertans working in school communities in implementing 'Education for Reconciliation'. Through the term of the grant, the CRC and ERLC Education for Reconciliation team will be responsible for providing professional learning within school communities that lead to an increased awareness and understanding of First Nations, Métis and Inuit histories, perspectives, and ways of knowing for the purpose of implementing treaty and residential schools' education and the Truth and Reconciliation Commission's *Calls to Action* for education. The Education for Reconciliation team will also move forward with developing and creating resources and professional learning opportunities that strengthen instructional leadership to lead learning related to foundational knowledge and its application in relation to the draft *Principal Leadership Quality Standard.* At the same time, the team will be delving deeper into the learning to support teachers' in the achievement of competencies related to First Nations, Métis and Inuit as well as curriculum implementation of Education for Reconciliation.

Through 2016-2017, the Education for Reconciliation team has created a robust menu for learning related to awareness and understanding of Foundational Knowledge. Conversation Guides, downloadable PowerPoint presentations, and other usable resources have been mobilized to the Empowering the Spirit website for ease of access by any member of a school community. In 2017-18 the emphasis of the work will move from the development of resources to support learning with Foundational Knowledge, to implementation throughout all regions in the province with the support of our ARPDC colleagues.

Moving Forward with High School Redesign Grant

CONSULTANTS

During the 2016-2017 school year, funding was provided for two consultants supporting schools in the implementation of Moving Forward with High School Redesign (MFWHSR) strategies to approximately 235 schools. (An increase from 61 schools the previous year) Primary focus was on supporting the Phase Five schools across the province in their first year of implementing more student-centered approaches with information and resources, and continuing to offer support and guidance as needed to schools further along in their implementation. All schools received on-site consultations, monthly updates, and access to online professional learning, with ongoing networking and collaborative opportunities.

COLLABORATION

During the 2016-2017 school year collaboration opportunities were provided in three areas. The MFWHSR Fall Collaborative had 669 attendees, with the keynote provided by the PALIX Foundation and breakout sessions focusing on the foundational principles. Four Spring Network Meetings were held continuing with the focus on the foundational principles and having the Palix Foundation provide follow up presentations. These events were planned by area planning committees from feedback and data from MFWHSR participants in the area. Finally funding was provided to each consortium to offer MFWHSR Collaborative learning opportunities based on jurisdiction needs participating in the program.

Challenges, Celebrations and Trends in Professional Learning

In recent years, the Alberta Regional Professional Development Consortia (ARPDC) continues to experience a myriad of changes and complexities as they respond to the goals, initiatives and areas of focus of the Alberta Education Business Plan and the identified professional learning needs of educators and jurisdictions throughout Alberta. The provincial education vision, and recent trends in education, provide a road map for Consortia to be responsive and work in a collaborative, coordinated manner, continuing to design and deliver cost-efficient professional learning opportunities to Alberta educators, school communities and education stakeholders.

We strive to support/prepare all education stakeholders in Alberta by providing adult learning opportunities and capacity building resources designed to impact professional practice and enhance student learning. Consortia accept and celebrate these changes and challenges and have responded by:

- Researching trends and current developments in the field of education and sharing best practices, and sharing this information with our stakeholders.

- Finding a balance between process, content and relevance when providing access to a variety of professional learning opportunities.
- Collecting and analyzing data, and utilizing this evidence to collaboratively plan programs responsive to the needs in each region.
- Maximizing the use of technology to coordinate provincial learning opportunities.
- Forming partnerships with a variety of PD providers, or brokering presentations on behalf of regional stakeholder groups.
- Hiring, training, and supervising staff involved in regional and provincial projects
- Leading, modelling and exploring new learning modalities to support professional learning.
- Providing cost effective, long term planning, and maintaining staff through a sustained funding commitment.
- Being responsive to requests from Alberta Education, districts and education partners.

The ARPDC continues to collaborate with Alberta Education and our regional partners to improve the learning of all education stakeholders.

Appendix C

Executive Director: Sandra Ciurysek
Sandra.Ciurysek@gppsd.ab.ca

Math Support Contractor:
glorway@thinking101.ca

NRLC Support for Mathematics Professional Development 2016-2017

The NRLC Plan for Support for Mathematics continues to evolve to meet the changing demands of the system it serves. The plan is organic and fluid and it is guided by a continual scanning of research on mathematics, teaching, learning and change. What we know from the literature is that the implementation of any curriculum change is a complex, long-term venture. A venture that demands the combined effort of the entire system, working together. It must be supported by uninterrupted funding that can be adapted and adjusted in response to the ambiguity and complexity which frames all human systems (Lorway, 2015). NRLC represents but one strand in a web of interrelated agents who can influence the success of that venture.

Effective and responsive teachers, matter much more than particular curriculum materials, pedagogical approaches, or "proven programs" *(Allington & Johnston, 2001; Darling-Hammond, 1999; Duffy, 1997; Pressley, et al, 2001; Sanders, 1998; Taylor, Pearson, Clark & Walpole, 2000).* The NRLC support for math teaching recognizes that investing in effective teaching is **the most "research-based"** strategy available. Effective teaching, effective instruction is a "hot topic" that often responds to trends and buzz words rather than a careful and studied review of the research. For the 2016-2017 school year the NCTQ document: Learning about Learning was used as a frame of reference. (Attached in appendix).

The conceptualizations embedded in the 2007 Program of Studies for Mathematics, 2007, (update 2016) challenge educators to transform their beliefs and understandings of what it means to "do" mathematics. Many, if not all experienced school mathematics as an exercise in copying, memorizing regurgitating for the test sets of unrelated, meaningless facts, formulas and procedures. Their experiences throughout their own schooling often, if not always work against them as they struggle to transform their practice.

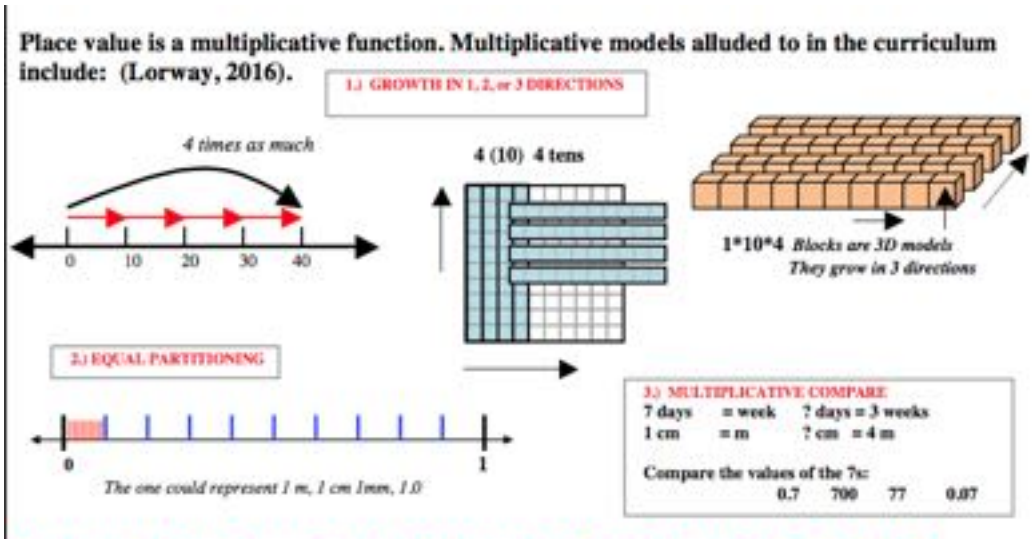
"Enacting this curriculum requires teachers to learn to engage students in complex reasoning through authentic tasks and contexts, to find ways to connect students to the content through ***mathematical reasoning****, despite having never experienced it themselves" (Ball, 2014).* The time that must be invested in allowing teachers opportunities to learn, practice, make mistakes, re try, relearn is continually underestimated when decisions about support are made (Lorway, 2016).

'Early adaptors' demand a different level of support than their colleagues, teachers new to the profession, new to a grade level, new to the assignment of mathematics, all come to professional learning experiences at different readiness levels and require different levels of support. An organic constructivist approach to the development and sustainability of professional learning activities is therefore likely to have the most success.
As a Consortia, NRLC continues to respond in as timely a manner as possible to requests for support from teachers, schools and Districts.

In recent years there has been an explosion of research studying the interplay between spatial reasoning and mathematics learning. A focus on spatial thinking allows mathematics to become a more visual endeavour and connects with how "real" mathematicians study and learn. Researchers have found spatial thinking to be a better predictor of mathematics success than either verbal or mathematical skills (Drefs & D'Amour, 2014, Farmer et al. 2013, Wai et al. 2009). Evidence is mounting that learners are harmed or halted in their progression in mathematics due to lack of attention to spatial reasoning and geometry (Casey & Erkut, 2005; Clements & Sarama, 2011). A focus on spatializing teaching and learning is clearly evident within this report and a major theme within NRLC math support events and offerings.

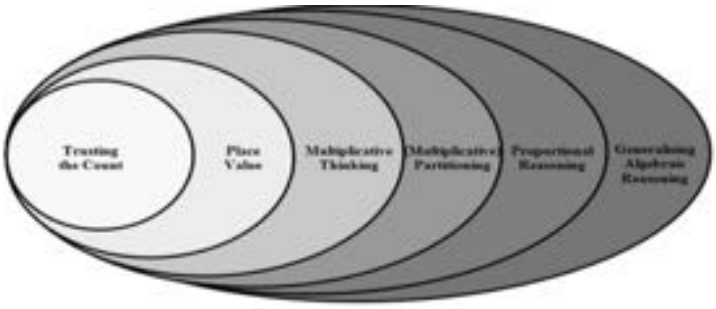
Building Regional Capacity

T**he NRLC sponsored Numeracy/Literacy/Competencies Instructional Leadership Cohort** met four times during the year. One key focus for this team: **Unpacking the EMPLO themes of Equality, Additive Reasoning, Multiplicative Reasoning. The graphic below highlights 3 multiplication models that can be tracked across the POS.**



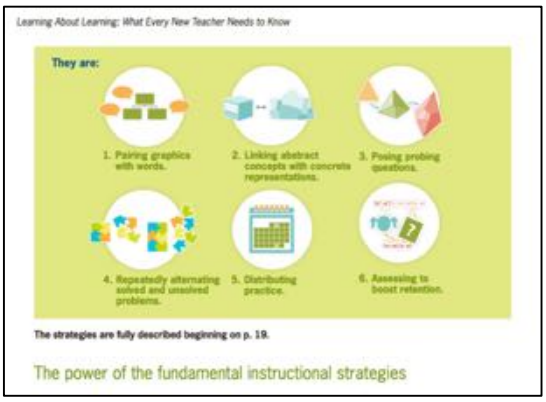
Another critical focus**: Identifying, organizing and teaching from a more connected view of mathematics that includes literacy and the competencies.**

.



If change is to occur it needs to be based on a view of the 'big ideas' of number being developmentally linked. This clashes with the traditional linear way of presenting curriculum content. The latter encourages teachers to teach only the content 'designated' to their particular year level without necessarily ensuring that children have the pre-cursor knowledge required to be able to understand it. The situation where children may lack specific knowledge or may develop misconceptions is exacerbated the further they move through school. What needs to happen is for teachers to be encouraged to use 'big ideas' as a series of coherent concepts connected in developmental ways. That is, the foundations for some later concepts are being laid years before full understanding of the concept may manifest itself. (Hurst & Hurrell, 2014)

A third area of focus and study: **The power of fundamental instructional strategies** as outlined by the National Council on Teacher Quality. Full article is attached in appendix.



One powerful indicator of the influence and success of this ongoing cohort: Every year members of the group are chosen by their schools and districts to assume leadership roles. Over the years the NRLC Cohort has spawned more than 15 teacher leaders across the region.

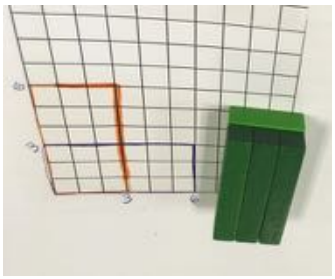
Materials and artifacts the Cohort have been developing can be found at http:// NRLCthink101math.wordpress.com

Challenges to the progress of this group and its members include:

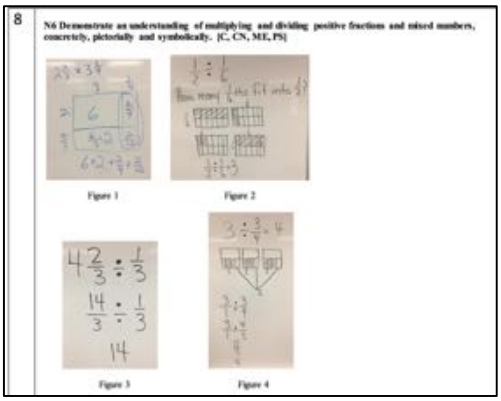
- The realities of the daily challenge that is teaching... Participants in the group struggle with balancing conflicting demands on their time. Although the dates are set out well in advance, participation is interrupted by the myriad of competing initiatives that arise over the course of the year.
- Members of the team are eager and willing to share their learning with colleagues, NRLC has no control over whether or not participants are given time, place or authority to share their experience and expertise with colleagues.

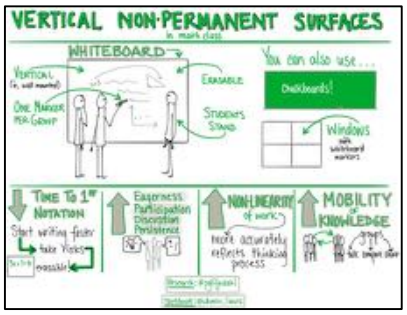
Support for Classroom Teachers:

Workshops AND SUMMER INSTITUTES developed and facilitated by Geri Lorway and co-sponsored with NRLC supported K to 6 teachers in building connections between Literacy and Numeracy as well as identifying and planning for activities that differentiate additive and multiplicative reasoning. The use, abuse and potential of Cuisenaire rods as a tool for thinking was a highly popular topic within these sessions.



NRLC provided funding to support ongoing coaching and mentoring support for a local Junior High group to continue their study of multiplicative reasoning with specific attention to area models. One of our local coaches provided on site leadership while Dr. James Tanton was available off site to vet the materials they developed. See Appendix documents for Report from Team.

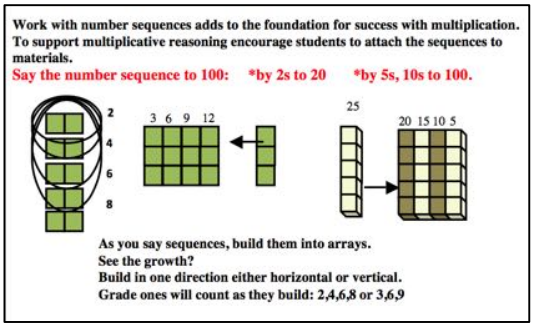




NRLC provided funding to support and sustain of a Senior High study group that met three times during the year under the tutelage of Dr Peter Liljehdahl. The focus of their study: “the thinking classroom

Contributing to Provincial Capacity

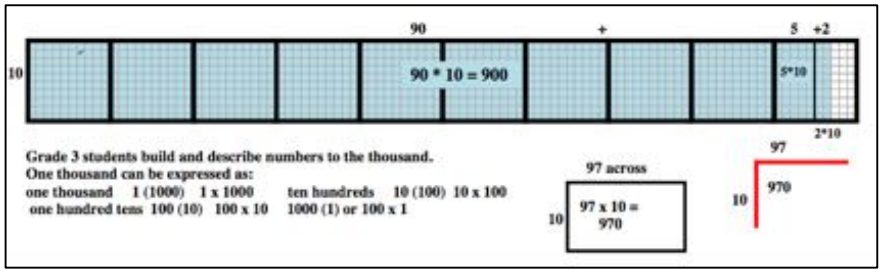
NRLC provided on site coaching for teams of Elementary Math Coaches to refine, extend and reflect on their coaching skills and content knowledge. That work formed the foundation for the mapping documents that will be posted on the EMPL site this winter.

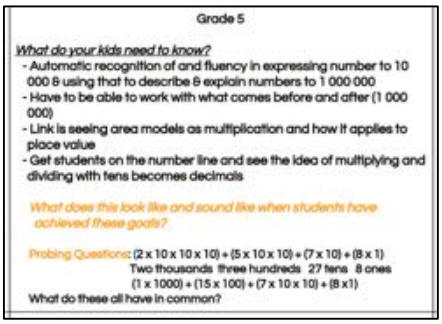


Grade one outcome link

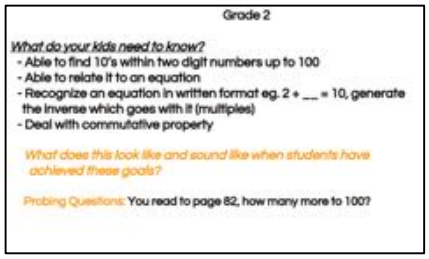
The topic: Multiplicative reasoning as it emerges across the strands and grades K to 5 in the program of studies.

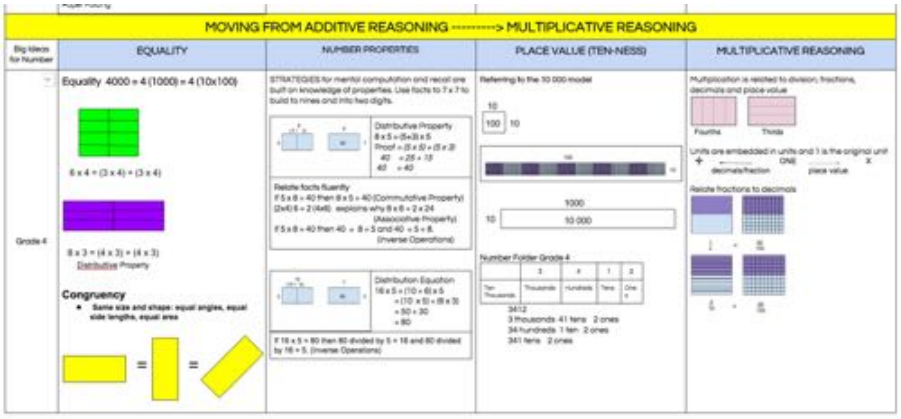
Grade three outcome link





Another set of materials that have emerged focus on the development of a series of diagnostic tools and tasks to support teachers in aligning their assessment to the essential outcomes in the curriculum. *(PWSD 76 Coaches supported by GLorway)*





And a third set of materials that highlight a continuum of visual spatial models for supporting the infusion of visual spatial models and the development of spatial reasoning across the grades.
See appendix for more.

PROVIDING THE SUPPORT TO KEEP TEACHERS EVOLVING: FINAL REFLECTIONS

Teachers who participated in any of the Mathematics PD offered by NRLC this past year, continue to assert that their personal learning is substantial, but taking the risk to transfer it to the classroom is very discomforting and stressful. Participating in real time demonstrations in the classroom followed by time to de-brief, opportunities to observe, analyze and evaluate video that highlights student thinking and reasoning, studying and delivering scripts of worked examples for lessons and discussions, support from coaches and opportunities to sit with colleagues to share experiences and build new connections are all critical components of what teachers describe as effective professional development that helps them transform their thinking and practice. Connecting topics, concepts and skills from Literacy to Numeracy to all subjects, a focus on learning from then teaching with visual spatial models, and opportunities to Learn how to teach for Understanding, to learn how to develop mental strategies for number computations and opportunities to see teachers and students in action are the most frequently requested supports.

TEACHERS AGREE THAT TEACHING in the 21st CENTURY requires that they **RELEARN** mathematics in a way that makes the learning a sense making process, helping them to understand and connect big ideas and how they emerge and develop across a span of grades. This is not simple, short term work. It takes hours and hours of learning time... A fact that is clearly supported in research:

When teachers receive well-designed professional development, **an average of 49 hours spread over six to 12 months,** they can increase student achievement by as much as 21 percentile points
(*Yoon, Duncan, Lee, Scarloss, and Shapley, 2007).*

On the other hand, learning events, workshops, no matter how well intended or orchestrated that **are spread over 14 hours** or less show no statistically significant effect on student learning
(Darling-Hammond, Wei, Andree, Richardson, and Orphanos, 2009).
Well-designed professional development provides for the following (Darling-Hammond et al., 2009):

- **Collaborative learning facilitated by a source of content Expertise:** Teachers have opportunities to learn in a supportive community that organizes curriculum across grade levels and subjects. Overwhelmingly they prefer face to face interactions. The learning must be guided by professionals in the field who possess a deep connected understanding of content, of pedagogy and of learning that reaches across grades, across curriculums and across strands.

- **Links between curriculum, assessment, and professional-learning decisions in the context of teaching specific content:** Particularly for math and science professional-development programs, research has emphasized the importance of **developing math and science content knowledge**, and the importance of attending to visual spatial reasoning as a precursor to academic success for all
(Blank, de las Alas, and Smith, 2008; Blank and de las Alas, 2009; Davis, 2016; Heller, Daehler, Wong, Shinohara, and Miratrix, 2012; Newcombe, 2012).

- **Active learning:** Teachers apply new knowledge and receive feedback, with ongoing data to reflect how teaching practices influence student learning over time. Again, this needs to be face to face and it needs to be fueled and fed by the prompting of outside expertise.

- **Deeper knowledge of content and how to teach it:** Giving teachers materials to try, telling them about techniques for designing engaging lessons, telling them to collaborate and share does not work. The work of teaching in the 21st century demands teachers personally engage in learning mathematics for understanding from "experts" who have indeed taught for understanding. Teachers are often required to UNLEARN content in order to re-learn in ways that demonstrate connectedness and reasoning.
(Ball et al. 1999, 2004)

- **Sustained learning events, convened over multiple days and weeks:** Professional-development efforts that engage teachers in **30 to 100 hours of learning over six months to one year have been shown to increase student achievement.**

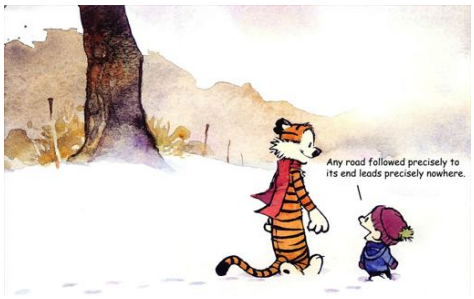
Once again, we acknowledge that the issues teachers and administrators bring forward around the need for sustained and uninterrupted TIME for study run wider and deeper than the scope of NRLC's influence.

Time should be allotted for mathematics teachers to study and compare the Alberta curriculum as written with the day to day curriculum they are enacting and assessing in their classrooms – at, above, and below the intended grade level or course they teach. Teachers need opportunities to interact with colleagues as they study the math they are charged with teaching, under the guidance of **content area researchers and specialists**, well versed in the learning progressions that are considered to bring the most affect to the most number of students. PLCs that leave teachers to "learn from each other" are doomed to fail when no outside eyes are available to provoke and challenge the "status quo."

There is a troubling trend that continues to flood the field, PLCs organized around a misplaced belief that teachers can lead themselves to "best practice" if we just put them together in groups.... The learning demanded of teachers if they are to be successful in meeting the needs of students, the demands of curriculum and the expectations of the Ministerial Order for Student Learning require access to Instructional, Curricular and Content **EXPERTISE** that is constantly evolving to meet the changing needs of our students and their families.

Helping teachers and administrators to break free of long standing habits of thinking, doing and assessing in classroom practice around mathematics teaching and learning requires the support of Critical Thinkers who sit outside and can challenge existing school norms, myths and ways of "doing". Critical Thinkers who can walk the talk with students and with parents, who can model the teaching, not just talk about it.

NRLC can support but not direct the actions of Districts and Schools to challenge teachers in their learning, to challenge administrators in their support of teacher learning, to include outside expertise into the PLCs, to build long term approaches to continual learning that focus on connecting initiatives for change, that focus on critical thinking, that develop networks for support that weave teaching and learning together to meet the needs of all learners by growing connections and pruning out dead ends... As a consortium, we can be vigilant and thorough in our research as we search out speakers, workshop leaders and professional learning facilitators to provide support that aligns with the ALBERTA curriculum, content, process and competencies but as the old saying goes: "you can lead a horse to water..... but who bears the responsibility for making the expectation clear that the horse must drink?"



Administrators, *at all levels of the system, must actively* ***demonstrate enduring*** *support for the* ***school management practices, teacher learning opportunities, process coaching, expert consultations, vivid demonstrations of alternative practices,*** *and* ***inquiry groups, that must be a part of the plan for change.*** *That enduring support must continue* ***for years, not months****. They must budget for the continuing cost of resources needed to actualize the* ***innovation within every classroom.*** *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 the intended change within every classroom. (Fullan, 2010).*

January 2016

Learning About Learning

National Council on Teacher Quality

Letter of Support

We have spent much of our professional lives researching learning and cognition. In the course of that work, we have used and reviewed many textbooks of educational psychology and instructional methods — textbooks that are required reading in teacher preparation programs. We have been consistently frustrated by the lack of discussion in many of these textbooks of teaching strategies that are backed up by strong evidence, and by a frequent overemphasis on strategies for which evidence is anecdotal at best.

Teaching aspiring teachers how to maximize student learning and retention is the paramount task of their training. It is therefore of real consequence that the guidance given by textbooks on these topics makes only passing reference to essential knowledge about learning.

We are excited about this new study by the National Council on Teacher Quality, which documents and highlights these problems in a clear and compelling fashion. The study should trigger an overdue discussion among authors, publishers, and teacher educators about how teacher candidates can be taught empirically supported methods that promote student learning.

Dr. John Dunlosky
Professor, Department of Psychological Sciences
Director, Science of Learning and Education (SOLE) Center
Kent State University

Dr. Arthur Graesser
Professor, Department of Psychology
University of Memphis

Dr. Richard Mayer
Professor, Department of Psychological and Brain Sciences
University of California, Santa Barbara

Dr. Hal Pashler
Distinguished Professor, Department of Psychology
University of California, San Diego

Dr. Katherine Rawson
Professor, Department of Psychological Sciences
Kent State University

Dr. Dan Robinson
Director of Research, Evaluation and Learning Analytics
Learning Sciences
The University of Texas at Austin

Dr. Melody Wiseheart
Associate Professor, Department of Psychology
York University

Learning About Learning: What Every New Teacher Needs to Know

Executive Summary

Why this study?

Every year about 190,000 teacher candidates graduate from traditional teacher preparation programs believing they are ready to begin the relentlessly demanding career of teaching. Each of these aspiring teachers will have taken at least one education psychology course or instructional methods course (usually both) designed to teach them how children learn and how to create lessons whose content their students will remember. These topics then will be revisited in much of their other coursework. No other subjects will receive as much attention during teacher training as those that purportedly focus on how students learn.

This report contends that textbooks used in this coursework neglect to teach what we know about how students learn despite its central importance in training. Compelling cognitive research that meets scientific standards about how to teach for understanding and retention barely gets a mention in many texts, while anecdotal information is dressed up as science. Theories du jour and debunked notions are being passed on to new teachers as knowledge and best practice.

Put simply, publishers and authors are failing both aspiring teachers and the teaching profession. They are not ensuring that the core texts designed to produce our next generation of teachers are giving candidates the most fundamental information needed to make learning "stick." The transfer of knowledge — from researchers to publishers to teacher educators to aspiring teachers — is not happening while the need to impart it has never been more urgent.

In practice, what does that mean for aspiring teachers?

First, they're wasting a lot of money. Each teacher candidate likely will buy at least one often- pricey book for their ed psych course and another for their methods course, leading to upwards of $40 million in total spending by each year's crop of new teachers.[1]

But far more important, when teachers aren't trained well, they try to learn on the job — by guessing in the classroom. Being unprepared can overwhelm and even defeat novice teachers at the moment they're most vulnerable. Students are the losers.

The antidote, of course, is that teacher candidates should learn **research-proven instructional strategies** in their textbooks and practice them — again and again — during their training.

This report examines some of the most widely used textbooks in teacher preparation programs today. Specifically, it looks for the degree to which teacher candidates are taught instructional strategies that decades of research confirm can be the most effective.

How were these strategies determined?

In *Organizing Instruction and Study to Improve Student Learning: A Practice Guide*, the Institute of Education Sciences (IES), the research arm of the U.S. Department of Education, identified proven practices that promote learning for all students, regardless of grade or subject, and that are especially potent with struggling students. Six practices stand out for the research behind them. There is little debate among scholars about the effectiveness of these six strategies:

What are the six strategies that work?

The first two help students take in new information:

1. **Pairing graphics with words.**
   Young or old, all of us receive information through two primary pathways — auditory (for the spoken word) and visual (for the written word and graphic or pictorial representation). Student learning increases when teachers convey new material through both.
2. **Linking abstract concepts with concrete representations.**
   Teachers should present tangible examples that illuminate overarching ideas and also explain how the examples and big ideas connect.

The second two ensure that students connect information to deepen their understanding:

3. **Posing probing questions.**
   Asking students "why," "how," "what if," and "how do you know" requires them to clarify and link their knowledge of key ideas.
4. **Repeatedly alternating problems with their solutions provided and problems that students must solve.**
   Explanations accompanying solved problems help students comprehend underlying principles, taking them beyond the mechanics of problem solving.

The final two help students remember what they learned:

5. **Distributing practice.**
   Students should practice material several times after learning it, with each practice or review separated by weeks and even months.
6. **Assessing to boost retention.**
   Beyond the value of formative assessment (to help a teacher decide what to teach) and summative assessment (to determine what students have learned), assessments that require students to recall material help information "stick."

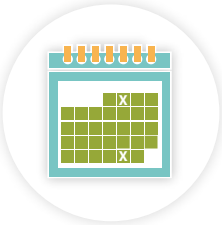
The strategies are fully described beginning on p. 19.

The power of the fundamental instructional strategies

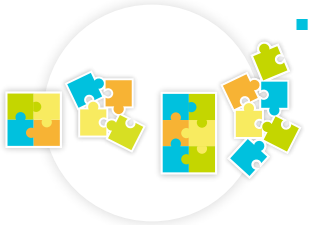
There is little debate among scholars about the effectiveness of these six strategies.[4] Since publication of the IES practice guide in 2007, support for the strategies has been further validated by dozens of strong studies cited in Appendix G.[5] In a general vein, Deans for Impact (a new organization dedicated to improving teacher preparation) published *The Science of Learning*, a six-page collection by Daniel Willingham, a prominent learning expert. This brochure provides "what we know about learning from a scientific standpoint" and features all six of the strategies.[6]

Each strategy is timeless, and impervious to change due to technological advances (in fact, they can and should be incorporated in educational technology) and other educational innovations. Teachers who know the fundamental instructional strategies will also be able to most effectively advise their students, so students can independently improve their own learning. For example, teachers who know the value of **assessing to boost retention** will advise their students that it is most effective to study material by self-testing rather than to reread, summarize, or highlight notes or text.

Other examples of how knowledge of these strategies can improve instruction include:



- **Distributing practice.**
  Practice is a regular part of most teachers' lesson plans. However, depending on the interval between instruction and practice, practice can have vastly different impacts on learning. A seminal study found big differences in performance in an 8th grade history class in which students were tested on material they had learned nine months earlier: Students who reviewed the material four months after they learned it remembered *twice* as much as students who reviewed the material just one week after it was taught.[7]



- **Alternating solved and unsolved problems.**
  It is common practice for teachers to spend the first part of a class period demonstrating problem solving and then have students solve problems for the remainder of the period, but it is not common for teachers to "interleave" solved and unsolved problems. How might interleaving be more effective? Students in a computer programming class who were given a set of 12 problems consisting of six solved problems *alternating* with six unsolved problems learned significantly more that students who were given the same set of 12 problems, but with all of the solved problems clumped together at the beginning of the set.[8]

Textbooks drive instruction

Examination of course materials from teacher preparation programs in the sample testifies to the importance of textbooks in disseminating knowledge and training teachers. Textbooks are the backbone of coursework and a critical resource for the teaching profession.

Although not all of the 219 educational psychology, general methods, and subject-specific methods courses reviewed for this study require a textbook to support instruction on how to design lessons, more than 85 percent do. In a sample of these courses, the vast majority (79 percent) of instructors who assign a text for their courses clearly organize instruction around that text — as evidenced by class discussions and/or assignments keyed to specific textbook chapters (e.g., sample below).[9] For example, the topics for individual class meetings listed in syllabi are often the same as the list of chapter titles in the table of contents of the assigned text.

An examination of lecture and discussion topics, assignments, and assigned readings in ed psych and general methods coursework in which instructors decide to assign a variety of articles and shorter pieces of reading instead of a text found that the courses typically address the same topics as courses with textbooks.[10]

In short, our analysis affirms common sense: Textbooks both capture and reinforce the consensus of the field as to what future teachers need to know about instructional strategies. What these textbooks fail to cover is by no means inconsequential.

Course Outline

Week	What is Due?	Topic of the Day
1/23		Chapter I – Learning, Teaching and Educational Psychology
1/30		Chapter 14 – Teaching Every Student

4. The fundamental instructional strategies

Why are the fundamental instructional strategies fundamental?

How all people, including children, learn and retain information is described by what cognitive psychologists term an "information processing model." New material is taken in through the senses and placed in working memory. Working memory can only hold information for a brief time, and its capacity is limited, so unless information is transferred to long-term memory, it will be forgotten. Information in long-term memory can also fade away, but it is more likely to be retained if it is retrieved periodically.

From science to the classroom

In recent years, researchers have made great strides in identifying instructional strategies that leverage how the brain takes in and stores information.

The six instructional strategies identified in the IES practice guide as having the strongest levels of research support are *fundamental* because, while their mode of application may vary, they all can be used by teachers in any classroom activity, in any subject, and at all grade levels. Teachers can use these strategies to maximize student learning and retention of knowledge, to stimulate transfer, and to create opportunities for retrieval.

Teachers can now make more informed, scientifically based instructional decisions, such as determining whether it would be more productive to ask one type of question instead of another, or whether to schedule practice exercises on a topic four weeks after the topic is introduced rather than a few days later. The same reasoning can apply whether the topic is World War II or basic addition, and whether the audience is kindergarteners, middle schoolers, or high school seniors.

Teachers should employ these six strategies as often as each naturally fits into instruction — and it is especially important to utilize them in the design of instruction for students who have weak foundations in a subject. The merits of the strategies include:

- Their use does not depend on technology, nor do they require special materials or resources.
- They can be integrated in a variety of ways whether instruction is teacher-directed, student-centered, project-based, inquiry-based, and so on.
- They don't impose curriculum straitjackets that limit a teacher's creativity.

- They allow for differentiation. For example, problem sets used by some students may be more difficult than those used by others while still implementing the strategy of **repeatedly alternating solved and unsolved problems** with fidelity.

Lessons that have only superficial similarities to lessons using the fundamental instructional strategies could miss the boat for improving student learning and retention. In the examples that follow, a specific use of each strategy is contrasted with a "missing the boat" approach that fails to capture one or more of its essential qualities.

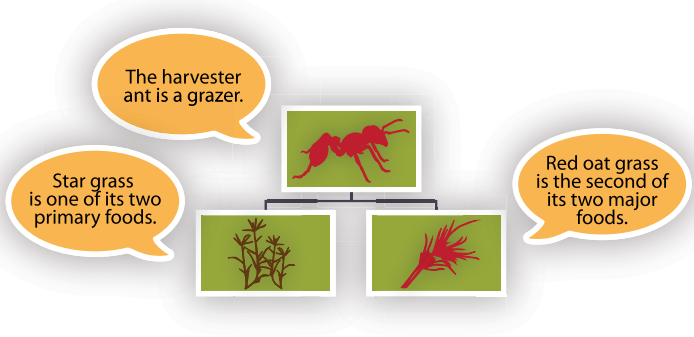
The six fundamental instructional strategies every teacher needs to know

Two strategies that help students take in new information

1. Pairing graphics with words.

Because people receive information through two primary pathways — auditory and visual — student learning increases when teachers convey new material both verbally and through graphics that convey key concepts and ideas. Graphics include illustrations, diagrams, and flow charts, as well as animation or video. Simple images in drawings or photos are not sufficient, unless they are carefully chosen to convey entire concepts.[48]

Instructional goal: Teaching middle-school students about the Sub-Saharan savanna food web

Effective: *Pairing concept-rich graphics with words when introducing new material*	Missing the boat: *Producing graphics only after information is presented*
While introducing material about the savanna, the teacher discusses a labeled flow chart showing interactions among all of the organisms living in the savanna.  	After showing her class photos of a variety of organisms that live on the savanna and discussing the organisms' interactions, a teacher asks students to create concept maps that summarize what they have learned about producers, consumers, decomposers, and other elements of the food chain.

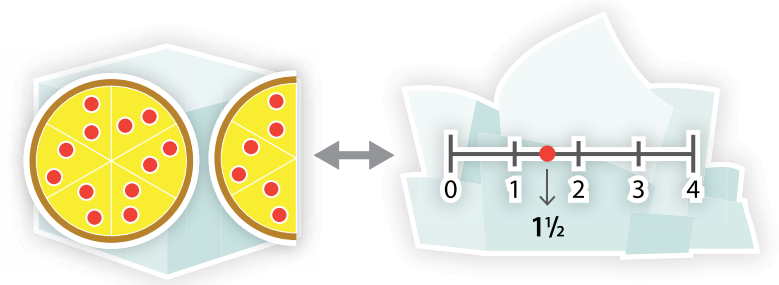
Note: *Student production of graphics is a valuable learning experience, but it doesn't substitute for the instructional use by teachers of paired graphics and verbal descriptions.*

2. Linking abstract concepts with concrete representations.

Presenting concrete examples helps students understand new ideas, while connecting those examples to abstract ideas allows students to apply concepts in new situations. For example, teaching young students the general principle that all organisms are adapted to their environments will help them to see that squirrels — and not just more exotic animals like polar bears — must cope with their local weather.

Despite the common belief that young children can only understand concrete information (which implies that concrete examples are most important in elementary grades and less so later), some appropriately presented abstractions can be understood by young children and concrete examples can be important learning tools for individuals of all ages.

Instructional goal: Teaching elementary students about fractions

Effective: *Using concrete and abstract representations in concert*	Missing the boat: *Using concrete representations that do not connect readily to important abstractions and failing to explicitly make that connection*
Students work problems with pizza slices in which fractions of several wholes add up to a fraction greater than one whole pizza; they also demonstrate each calculation on a number line. The teacher emphasizes that all fractions are numbers.  concrete abstract	Students repeatedly practice fraction problems using fraction bars, but only to show parts of a whole. Because these problems do not help them understand that fractions are numbers and can be greater than 1, they are confused when the teacher asks a question about the fraction "4/3."

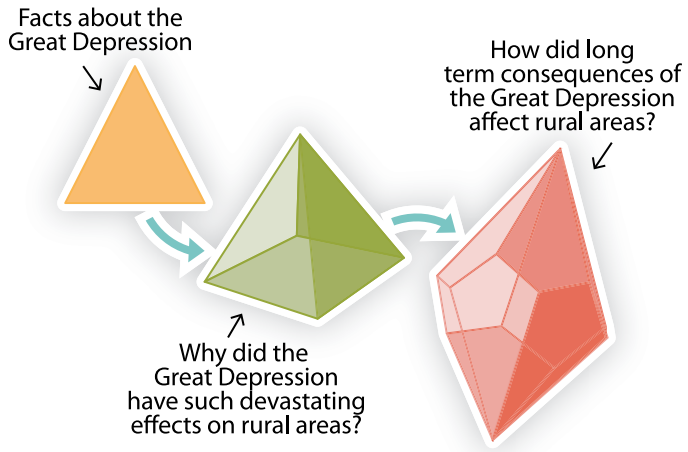
Two strategies that connect information to deepen students' understanding

3. Posing probing questions.

Asking "why," "how," and "compare and contrast" questions helps clarify and strengthen students' knowledge of concepts. These questions require more than mere factual knowledge by forcing students to examine causal mechanisms, evidence for arguments, and comparisons of key ideas. Students must go beyond an exchange of opinions or feelings, which may or may not be rooted in knowledge or understanding. Probing questions can be part of instruction or class discussion, or self-administered as part of independent work.

Instructional goal: Foster an understanding in high-school students of the Great Depression

Effective: *After students have acquired basic knowledge, asking questions that require students to synthesize information and extract key concepts*	Missing the boat: *Asking questions that depend on opinions or feelings*
After students have read excerpts from a diary of a girl growing up in rural Iowa in the 1940s and 50s as well as a series of newspaper articles spanning the Great Depression to the 50s, the teacher asks, "How did long-term consequences of the Great Depression affect rural areas?"	After students read a diary entry written by a teenager living in the Dust Bowl during the Great Depression, the teacher asks how students think they would have felt if they had lived during that period.

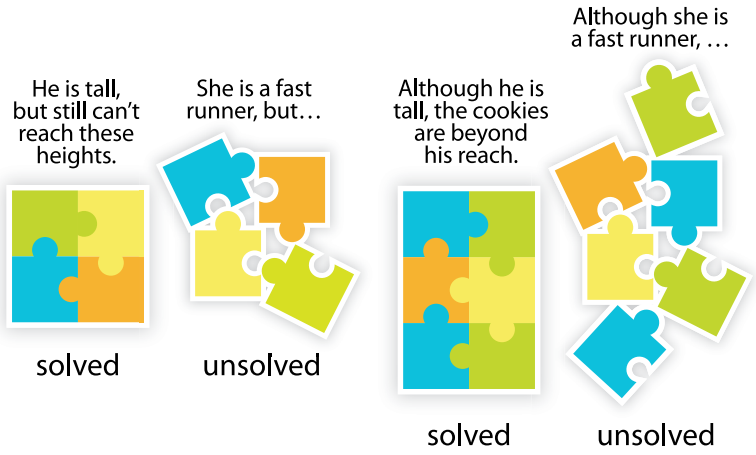


4. Repeatedly alternating problems with their solutions provided and problems that students must solve.

Teachers often demonstrate how to do a few problems (whether writing compound sentences or adding fractions), and then ask students to complete a set of similar problems on their own. Students learn more, however, when they are given incremental guidance on problem solving. In a type of "interleaving," problems with written-out solutions should alternate repeatedly with problems that the students will solve. Solved problems help students focus on the underlying principles that apply to each situation, instead of promoting mechanical solution of problems.

Especially for difficult content, giving several written-out solutions for each unsolved problem is helpful. As students become more skilled, teachers can increase the number of problems that students solve on their own following each solved example.

Instructional goal: Teach elementary students how to construct sentences with two clauses

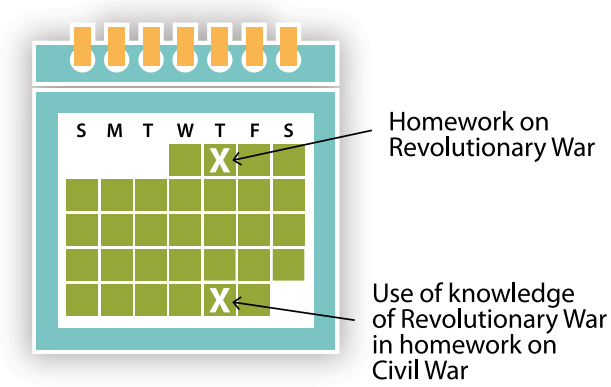
Effective: *Repeatedly alternating solved problems and problems to be solved*	Missing the boat: *Following a short demonstration of problem solving with independent practice*
Elementary language arts students work in cooperative learning groups on a sentence construction assignment that includes eight problems. All of the odd problems have solved examples. The even problems are left to the students to solve.  	A teacher shows two examples of accurate sentence construction and then provides each cooperative learning group with a set of eight sentence construction problems to be solved.

Two strategies that require retrieval and thereby improve student retention

5. Distributing practice.

All learners remember information better when they are exposed to it multiple times in practice sessions spaced over significant intervals. To foster long-term retention, teachers should expose students to important material at least twice and plan review opportunities weeks and then months after information is first introduced.[49]

Instructional goal: Ensure that high-school students retain information learned in a history class

Effective: *Exposing students at least twice to material and delaying review*	Missing the boat: *Reviewing too soon after first exposure and allowing student recall to be prompted*
In late October, a history teacher includes questions in a homework assignment on the Civil War that require students to use their knowledge of the Revolutionary War (last refreshed in a homework assignment in early October) to compare the two conflicts.  	Each Friday, a teacher in an American history class has students do an open-book warm-up exercise on material learned that week.

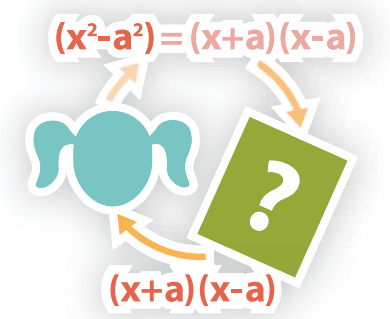
6. Assessing to boost retention.

The adage "use it or lose it" is based on a scientific fact. Every time a person is asked to retrieve information from memory, the retrieved information becomes more cemented in memory. Assessments of any nature — a low-stakes quiz or a high-stakes test, final exam, medical board, bar exam, or driver's test — are all useful not only to determine if someone knows or has learned material but also to boost learning and retention, especially when hints or prompts are minimized.

In addition, timely and substantive feedback on the correct answers reinforces learning. Without this feedback, assessments will strengthen memories of incorrectly remembered information as well as correct information.

Instructional goal: Ensure that middle-school students retain information learned in an algebra class

Effective: *Assessing frequently, using assessments that force students to recall information on their own, and providing feedback on correct answers*	Missing the boat: *Not forcing students to recall information on their own and not providing feedback*
A teacher who gives weekly quizzes to gauge her students' progress concentrates on questions about factoring "the difference of two squares" that force students to devise answers with no outside assistance (for example, avoiding multiple-choice questions that minimize recall) and provides feedback on correct answers.[50]	A teacher has students answer a question as a class "exit ticket." Students are allowed to refer to their notes to answer the question, and the teacher does not review the results with the class.



Multiplicative Reasoning Project Report
GPPSD Grade 6 to 9 teacher cohort

Work supported by funding from NRLC, 2016- 2017

5

N2 Use estimation strategies in problem-solving contexts. [C, CN, ME, PS, R, V]
N4 Apply mental mathematics strategies for multiplication. [C, CN, ME, R, V]
(annexing, commutative and distributive properties, etc.)
BIG IDEA: N5 Demonstrate, with and without concrete materials, an understanding of multiplication (2-digit by 2-digit) to solve problems. [C, CN, PS, V]

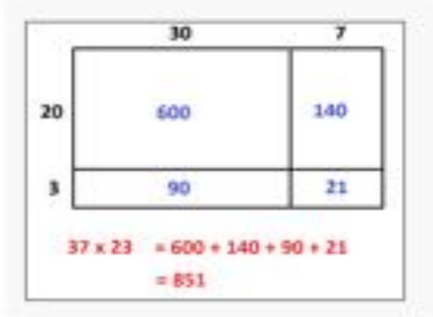


Figure 7

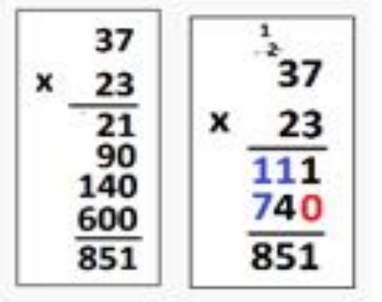


Figure 8

An area model is a visual representation of multiplication or division. It can be used to help students better visualize what is happening in a problem-solving context creating a conceptual understanding of the abstract. The shape of an area model is a square or rectangle, with the lengths labeled with corresponding numerals (see figure 7).

What makes an area model useful? Area is a conserved quantity. In other words, you can break one large area into several pieces; find the areas of the pieces individually; then add to get the area of the whole (Suzuki, 2014).

According to Alberta curriculum, the goal of efficiency is for students to be using a strategy that is effective for them, with understanding, including the use of a standard algorithm when ready. The use of an area model is transparent, it is easier for many students to keep track of their thinking and for them to find and fix mistakes. If introduced too early in the progression, the standard algorithm simply becomes steps that have no justification beyond procedures and straight computation. Once students have developed an understanding of the part-whole relationship through the use of an area model, transitioning to a standard algorithm (for most) is natural, appropriate, and most effective (see figure 8).

What to look for: We want to avoid area model work becoming its own rote procedure. To avoid this, realize that understanding of efficient distribution begins with an understanding of expanded form and place value. In the example above 23 x 37 (see figures 7), efficient distribution is illustrated (but students may begin this process with a distribution of 23 as 10 + 10 + 3 and of 37 as 10 + 20 + 7.

If adding the products is an issue for students, developing additive reasoning skills is important (a little bit often).

N6 Demonstrate, with and without concrete materials, an understanding of division (3-digit by 1-digit), and interpret remainders to solve problems. [C, CN, ME, PS, R, V]

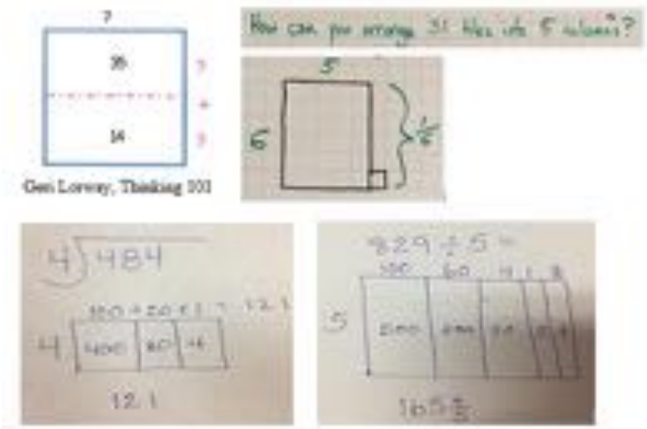


Figure 9

Area models can also be used to help students better visualize the inverse operations to multiplication: division. When building with Cuisenaire rods, the idea of thinking multiplication for division should be introduced. After multiple exposure with the build, the use of an area model can be introduced for division. In the case of the second visual provided, students distributed 484 into 400 + 80 + 4 and asked themselves "4 times what equals 400?" and so on. Tasks can be created that support the idea of thinking multiplication for division (ex: Thinking 101 practice card). By the end of grade 5, students should demonstrate an understanding of division (3 digit by 1 digit) and interpret the remainders given the context of the problem (see figure 9).

What to look for: The context is essential in determining how to interpret the remainder. In figure 9, 829 people attended Mighty Peace Day. They were to be placed in 5 rooms for breakout sessions. How many people would be in each room? Based on the quotient, 4 rooms will have 165 people and the 5th room will contain 4 extra people).

SS2 Design and construct different rectangles, given either perimeter or area, or both (whole numbers), and make generalizations. [C, CN, PS, R, V]

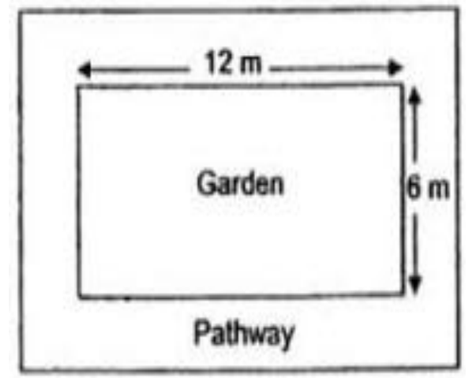


Figure 10

Area is the number of square units that covers a defined space. This specific outcome should be explored through real world examples (gardening (figure 10), creating a dog run next to the house, laying carpet, etc.) and linked to the use of an area model for multiplication and division.

What to look for: Making connections to real world applications and the link to area models.

6

N8 Demonstrate an understanding of multiplication and division of decimals (1-digit whole number multipliers and 1-digit natural number divisors). [C, CN, ME, PS, R, V]

SS3 Develop and apply a formula for determining the: perimeter of polygons, area of rectangles and volume of right rectangular prisms. [C, CN, PS, R, V]

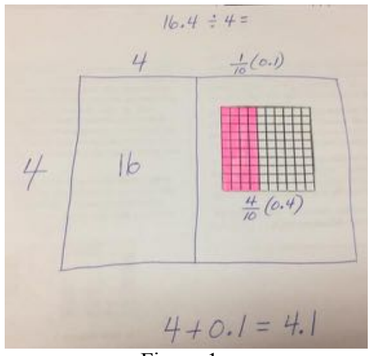


Figure 1

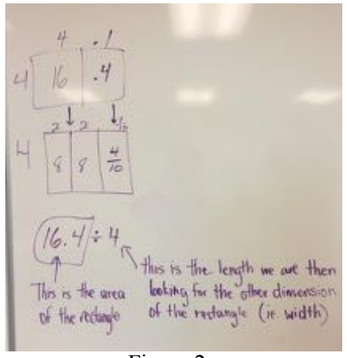


Figure 2

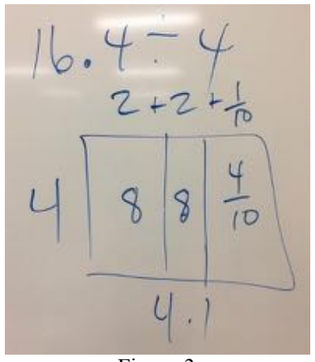


Figure 3

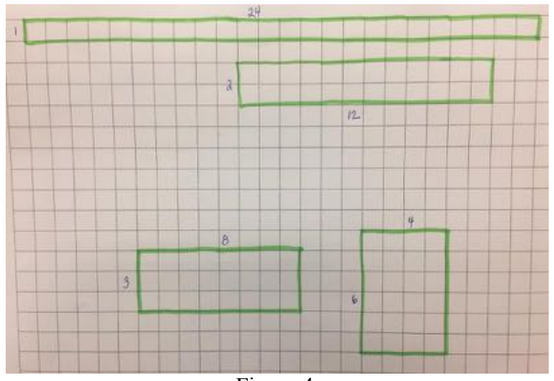


Figure 4

The visuals provided are samples of what multiplication of decimals through the use of an area model might look like by the end of grade 6. This is not your likely starting point. Outcome N1 should be a pre curser to this. Depending on your students, you may need to consider grade 5 outcomes as a starting point. This might including building with Cuisenaire Rods to show relationships. The visuals above demonstrate a progression of understanding for the multiplication and division of decimals. The first area model (figure 1) incorporates pictorial representations to help students understand the fractional components when dividing decimals. Once students have an understanding, then decimals or fractions can be used without pictorials (figures 2 and 3). This is not necessarily a step by step progression, but rather dependent on individual student understanding and abilities.

According to Alberta curriculum, the goal of efficiency is for students to be using a strategy that is effective for them, with understanding, including the use of a standard algorithm when ready. The use of an area model is transparent, it is easier for many students to keep track of their thinking and for them to find and fix mistakes. If introduced too early in the progression, the standard algorithm simply becomes steps that have no justification beyond procedures and straight computation. Once students have developed an understanding of the part-whole relationship through the use of an area model and pictorial representations where necessary, transitioning to a standard algorithm (for most) is appropriate and most effective.

What to look for: By the end of grade 6, students should be able to demonstrate and communicate, with understanding, multiplication and division with decimals.

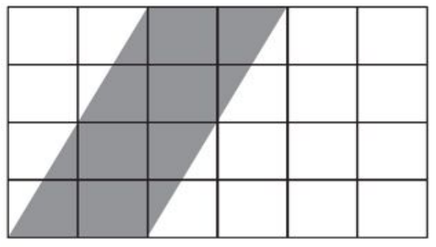
This outcome clearly articulates that students need to *develop and apply a formula for determining area of rectangles* (arrays). One approach that might allow students to build understanding in the context of this outcome is to have them represent arrays with a given area on grid paper.

Ask: Draw as many rectangles you can with an area of 24 cm². As students represent each rectangle (figure 4), they may use a one-to-one count to determine the area. The goal is to ask students to determine a more efficient way to come up with the area of the rectangles (space covered). With guidance, students should be able to develop and apply a formula for determining the area of rectangles.

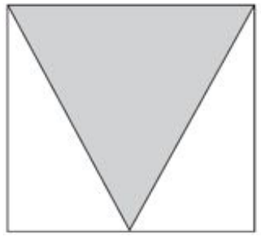
This type of task could also be used to support students in determining and understanding factors. (N3 Demonstrate an understanding of factors and multiples… [CN, PS, R, V])

What to look for: By the end of grade 6, students will be required to apply a formula for determining the area of rectangles in various contexts while making connections (CN) with others curricular outcomes and reasoning (R) through problems. The following examples are from a released grade 6 PAT.

What is the area of the shaded region on the grid shown above if the area of the entire grid is 96 cm²?



The area of the shaded isosceles triangle shown below is 24 cm².



What is the area of the entire square?

7

N2 Demonstrate an understanding of addition, subtraction, multiplication and division of decimals to solve problems (for more than 1-digit divisors or 2-digit multipliers, the use of technology is expected). [ME, PS, T] [ICT: P2.4]

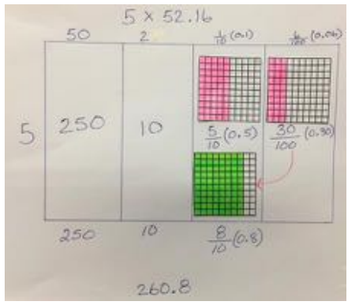


Figure 1

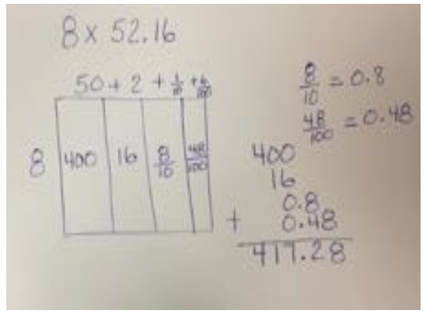


Figure 2

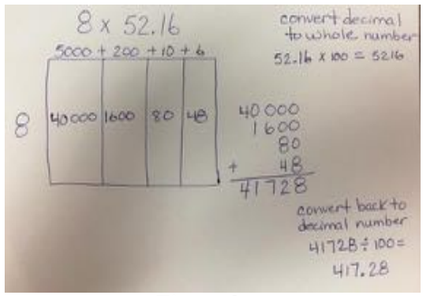


Figure 3

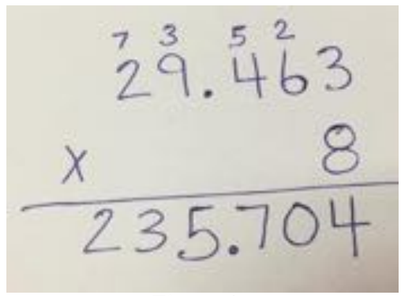


Figure 4

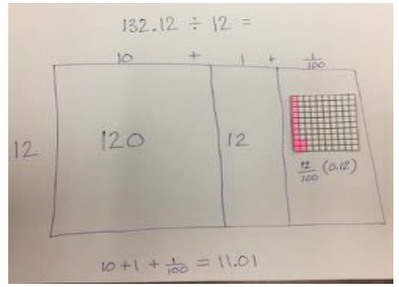


Figure 5

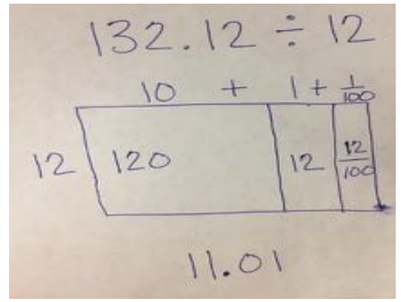


Figure 6

132.12 ÷ 12 =

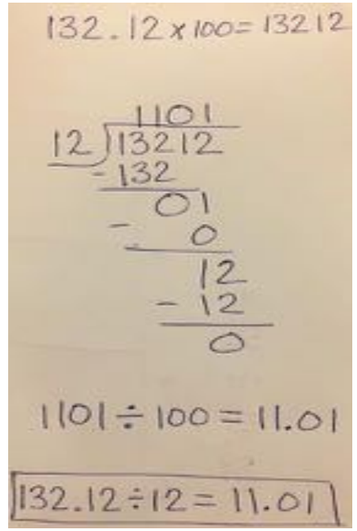


Figure 7

The visuals provided are samples of what multiplication and division of decimals through the use of an area model might look like by the end of grade 7. This is not your likely starting point. Depending on your students, you may need to consider grade 6 outcomes as a starting point. This might including building with Cuisenaire Rods to show relationships. The visuals above demonstrate a progression of understanding for the multiplication and division of decimals. The first area model (figures 1 and 5) incorporate pictorial representations to help students understand the fractional components when multiplying and dividing decimals. Once students have an understanding, then decimals or fractions can be used without pictorials (figures 2 and 6). Another possibility is for students to convert decimals to whole numbers and then back to decimals again as seen in figures 3 and 7. This is not necessarily a step by step progression, but rather dependent on individual student understanding and abilities. Once students have demonstrated understanding, the use of technology is expected for more than 1-digit divisors or 2-digit multipliers.

According to Alberta curriculum, the goal of efficiency is for students to be using a strategy that is effective for them, with understanding, including the use of a standard algorithm when ready. The use of an area model is transparent, it is easier for many students to keep track of their thinking and for them to find and fix mistakes. If introduced too early in the progression, the standard algorithm simply becomes steps that have no justification beyond procedures and straight computation. Once students have developed an understanding of the part-whole relationship through the use of an area model and pictorial representations where necessary, transitioning to a standard algorithm (for most) is appropriate and most effective (see figures 4 and 7).

What to look for: By the end of grade 7, students should be able to demonstrate and communicate, with understanding, multiplication and division with decimals.

7 **SP 6 Conduct a probability experiment to compare the theoretical probability (determined using a tree diagram, table or other graphic organizer) and experimental probability of two independent events. [C, PS, R, T] [ICT: C7–3.2,** P2–3.4]

Problem: I roll a die and then toss a coin. What are the chances of seeing an even number followed by a head?

Figure 1

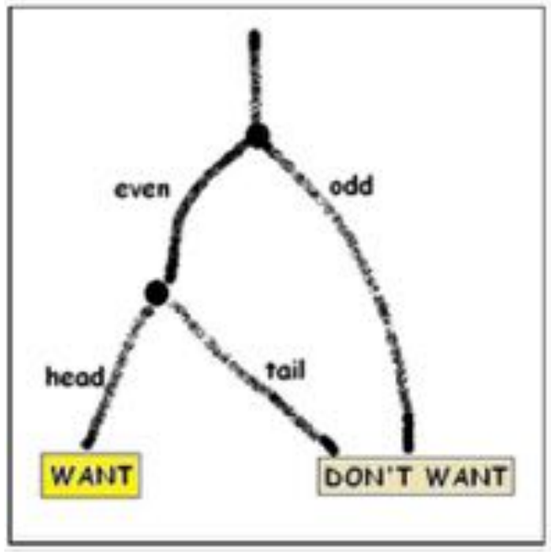


Figure 2

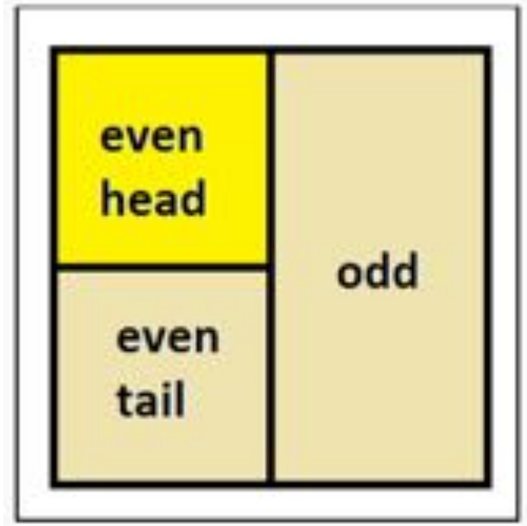


Figure 3 (area model)

1/2 x 1/2 = 1/4

Figure 4

When two events are said to be independent of each other, what this means is that the probability that one event occurs in no way affects the probability of the other event occurring. An example of two independent events is as follows; say you rolled a die and flipped a coin. The probability of getting any number face on the die in no way influences the probability of getting a head or a tail on the coin.

The visuals above were taken from the G'Day math garden path lessons. The progression represents a possible problem that could be used in supporting students' understanding of theoretical and experimental probabilities. Figure 2 shows a visual representation through the use of a tree diagram for the problem seen in figure 1. Figure 3 uses area model to represent the same information in an array. Through the use of an array, students can determine the probability outcomes more effectively. Although students are not expected to multiply fractions in grade 7, figure 4 illustrates the symbolic for the visual representations. These visuals are not your likely starting point. Teachers may need to start from outcome SP 4 from the grade 6 curriculum in order to review student background knowledge. Because these visuals only represent the theoretical probability of said problem, the next steps need to include students conducting the given problem in order to compare both the theoretical and experimental outcomes.

What to look for: Students should be able to communicate the differences between various theoretical and experimental outcomes and recognize that the more you repeat the experiment the more likely the results will be comparable to theory.

8

N6 Demonstrate an understanding of multiplying and dividing positive fractions and mixed numbers, concretely, pictorially and symbolically. [C, CN, ME, PS]

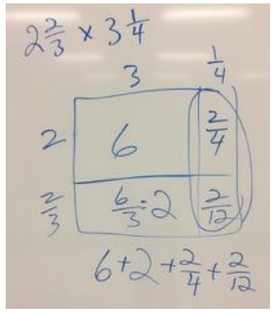


Figure 1

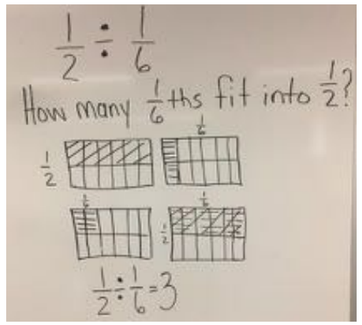


Figure 2

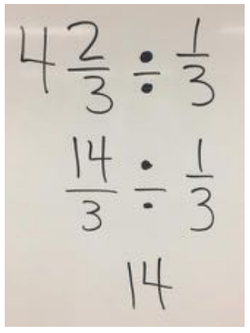


Figure 3

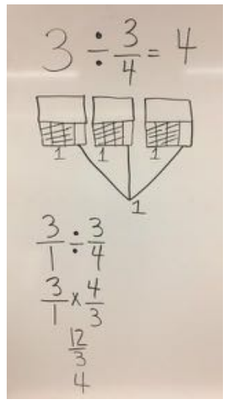


Figure 4

The visuals above represent a possible progression of multiplication and division of fractions and mixed numbers. This progression illustrates skills from pictorial to symbolic. Depending on student entry points, concrete representations can be demonstrated through the use of Cuisenaire Rods. Figure 1 shows the use of area model to multiply mixed numbers. Figures 2-4 demonstrate a progression of division of fractions and mixed numbers from pictorial to symbolic. Although N6 does not specifically state the need for students to demonstrate the reciprocal rule, some students may make this generalization on their own. Figure 4 shows the pictorial and reciprocal methods for division of fractions. This is not your likely starting point. Students need to develop an understanding of what it means to multiply and divide fractions (as seen in figure 2) before they can apply rules for efficiency.

What to look for: By the end of grade 8, students need to demonstrate an understanding of multiplying and dividing positive fractions and mixed numbers concretely, pictorially and symbolically.

PR 2 Model and solve problems, concretely, pictorially and symbolically, using linear equations of the form: a(x + b) = c where a, b and c are integers. [C, CN, PS, V]

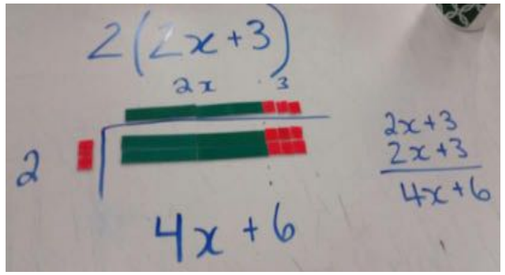


Figure 5

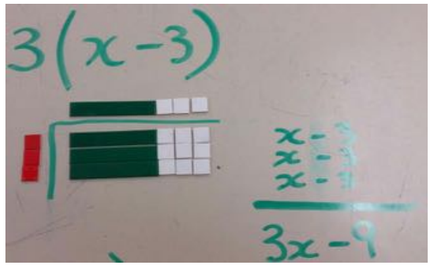


Figure 6

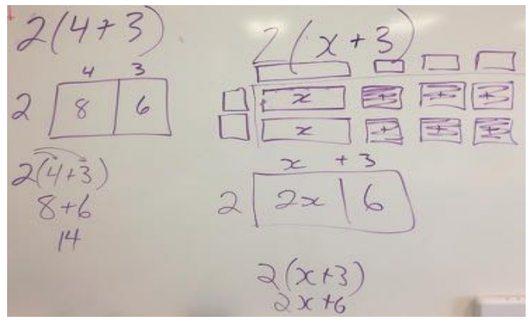


Figure 7

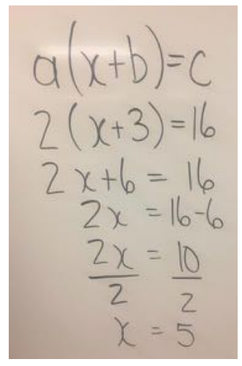


Figure 8

The visuals above represent a possible progression of skills from concrete, to pictorial, to symbolic. The algebra tiles can be used to model concretely integers and variables in an area model. They are especially useful in modeling multiplication and division because their dimensions are based on the concept of area. Figures 5 and 6 show the distribution of an expression using algebra tiles. Figure 7 moves to a pictorial representation while figure 8 is a symbolic representation of a linear equation in the form a (x + b) = c.

What to look for: By the end of grade 8, students should be able to model and solve problems, using linear equations of the form a (x + b) = c.

PS 2 Solve problems involving the probability of independent events. [C, CN, PS, T] [ICT: P2–3.4]

Problem: I toss a quarter, then I toss a dime and then I roll a die. What are the chances of receiving a head then a head and then a 3 or a 4?

Figure 9

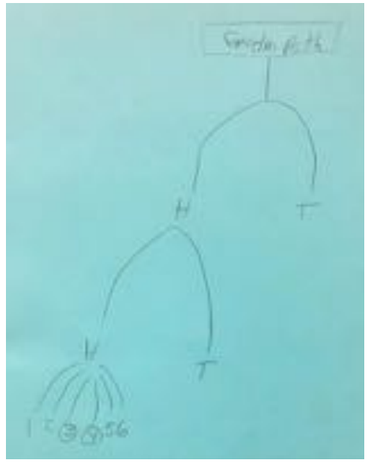


Figure 10

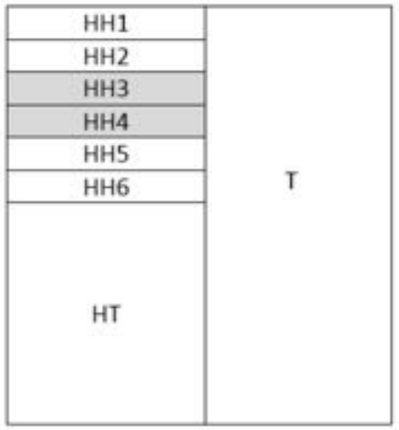


Figure 11 (area model)

1/2 x 1/2 x 2/6

2/24

1/12

Figure 12

When two or more events are said to be independent of each other, what this means is that the probability that one event occurs in no way affects the probability of the other event occurring. An example of more than two independent events is as follows; say you rolled a die, flipped a coin, pull a card. The probability of getting any number face on the die in no way influences the probability of getting a head or a tail on the coin or the card that is pulled.

The problem illustrated above shows a progression through the use of area model of the probability of independent events from pictorial to symbolic. Figure 9 is the problem. Figure 10 is the pictorial representation of these events while figure 11 illustrates the pictorial as an area model. Figure 12 shows the symbolic form.

What to look for: By the end of grade 8, students should solve problems involving the probability of independent events.

Problem taken from G'Day Math .com

An Outcomes Based Approach to Unpacking and Delivering AB Program of Studies for Mathematics

Work supported in part by funding from NRLC, 2016- 2017
Prepared and vetted by Thinking101
Developed in collaboration with PWSD76 coaches

PEACE WAPITI YEAR END GOALS FOR NUMBER SENSE (Reading and Writing Numbers)/SHAPE & SPACE

Mathematics is used to describe and explain relationships. (Alberta Program of Studies Pg. 8)
Visual images and visual reasoning are important components of number, spatial and measurement sense. (Alberta Program of Studies Pg. 6)
Brain research establishes and confirms that multiple complex and concrete experiences are essential for meaningful learning and teaching. (Caine and Caine, 1991) (Alberta Program of Studies pg. 5)

Grade 1

What do your kids need to know?

- Able to find the 5's within various numbers to 10
- When you tell me a number between 1 - 9, I can tell you the other part to make 10
- Know any teen number to explain in relation to 10 eg. 10 + 2

What does this look like and sound like when students have achieved these goals? Further work needed in all grade levels

Probing Questions/ Searching out the misconceptions - further work needed in all grade levels

Eg. Tell me a fact about 8. What other fact is related to 8?

Outcomes:

Number 2. Subitize (recognize at a glance) and name familiar arrangements of 1 to 10 objects or dots. [C, CN,ME, V]	3. Demonstrate an understanding of counting by: • indicating that the last number said identifies "how many" • showing that any set has only one count • using counting-on • using parts or equal groups to count sets. [C, CN,ME, R, V]	4. Represent and describe numbers to 20, concretely, pictorially and symbolically. [C, CN, V]
5. Compare sets containing up to 20 elements, using: • referents • one-to-one correspondence to solve problems. [C, CN,ME,PS, R, V]	6. Estimate quantities to 20 by using referents. [C, CN,ME, PS, R, V]	7. Demonstrate an understanding of conservation of number. [C, R, V]
8. Identify the number, up to 20, that is: • one more • two more • one less • two less than a given number. [C, CN ,ME, R, V]	**Shape and Space** 1. Demonstrate an understanding of measurement as a process of comparing by: • identifying attributes that can be compared • ordering objects • making statements of comparison • filling, covering or matching. [C, CN, PS, R, V]	2. Sort 3-D objects and 2-D shapes, using one attribute, and explain the sorting rule. [C, CN, R, V]
3. Replicate composite 2-D shapes and 3-D objects. [CN,PS, V]	4. Compare 2-D shapes to parts of 3-D objects in the environment. [C, CN, V]	

Grade 2

What do your kids need to know?

- Able to find 10's within two digit numbers up to 100
- Able to relate it to an equation
- Recognize an equation in written format eg. 2 + __ = 10, generate the inverse which goes with it (multiples)
- Deal with commutative property

What does this look like and sound like when students have achieved these goals?

Probing Questions: You read to page 82, how many more to 100?

Outcomes:

Number 4. Represent and describe numbers to 100, concretely, pictorially and symbolically. [C, CN, V]	5. Compare and order numbers up to 100. [C, CN, ME, R, V]	6. Estimate quantities to 100, using referents. [C, ME, PS, R]
7. Illustrate, concretely and pictorially, the meaning of place value for numerals to 100. [C, CN, R, V]	10. Apply mental mathematics strategies for basic addition facts and related subtraction facts to 18. [C, CN, ME, PS, R, V]	**Shape and Space** 2. Relate the size of a unit of measure to the number of units (limited to nonstandard units) used to measure length and mass (weight). [C, CN, ME, R, V]
5. Demonstrate that changing the orientation of an object does not alter the measurements of its attributes. [C, R, V]	6. Sort 2-D shapes and 3-D objects, using two attributes, and explain the sorting rule. [C, CN, R, V]	7. Describe, compare and construct 3-D objects, including: • cubes • spheres • cones • cylinders • pyramids. [C, CN, R, V]
8. Describe, compare and construct 2-D shapes, including: • triangles • squares • rectangles • circles. [C, CN, R, V]		

Grade 3

What do your kids need to know?

- Able to find 100's within a 3 digit number up to 1000 and know it's relationship to 1 000
- Show an organized list or pattern to follow how you can move in flexible place value
- See the growth of place value as an area model
- Describe a 3 digit number multiple ways using flexile place value
- Say the number sequence forwards/backwards by 5's, 10's, 100's (precursor to the above statement)

What does this look like and sound like when students have achieved these goals?

Probing Questions: What's the difference between 81 and 33?

Outcomes:

Number: 2. Represent and describe numbers to 1000, concretely, pictorially and symbolically. [C, CN, V]	3. Compare and order numbers to 1000. [C, CN, R, V]	4. Estimate quantities less than 1000, using referents. [ME, PS, R, V]
5. Illustrate, concretely and pictorially, the meaning of place value for numerals to 1000. [C, CN, R, V]	6. Describe and apply mental mathematics strategies for adding two 2-digit numerals. [C, CN, ME, PS, R, V]	7. Describe and apply mental mathematics strategies for subtracting two 2-digit numerals. [C, CN, ME, PS, R, V]
8. Apply estimation strategies to predict sums and differences of two 2-digit numerals in a problem-solving context. [C, ME, PS, R] **(End In Mind)** (Look at the equation and make a good prediction, Students must have fluency in numbers.)	10. Apply mental mathematics strategies and number properties in order to understand and recall basic addition facts and related subtraction facts to 18. [C, CN, ME, PS, R, V]	**Shape and Space** 6. Describe 3-D objects according to the shape of the faces and the number of edges and vertices. [C, CN, PS, R, V]

Created by April Brown & Leann Miller with assistance from Geri Lorway @Thinking101 for Peace Wapiti School Division #76

Grade 1 Vocabulary:

Subitize	Groups	More than	Automatic Recognition	Minimize the count
Sets	Parts/Whole	Less than	Edges, vertices	object/shape
Represent	Collections	Greater than	2D/3D	filling
turn/rotation	flip/reflection	slide/translate	**represent**	covering
strategy	sum-->whole	arrangement	orientation	matching
build	expression	**compare**	If...then...	benchmark
referent	re-compose	decompose	addends	Missing addends
composite	attribute	5 ness	sort	**explain**

Grade 2 Vocabulary:

equations	multiples	quantity	Making 10
Concrete, symbolic, pictorial	Number words to 100	10 x 10 grid, hundred grid	sides
Faces	Unit, unit of measure	doubles	Commutative property
Associative property	even , odd	Ten, hundred	Nonstandard units
Cube, sphere, cone, cylinder, pyramid	Triangle, square, circle, rectangle	Parallel, horizontal, vertical, diagonal	Chart, organizing data
Decade	10 ness		

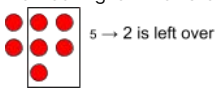
Grade 3 Vocabulary:

Multiples of 3, 4 and 25	visualize	relationships	Mental math
pentagons	hexagon	octagon	polygon
faces	edges	vertices	quadrilateral
hundreds	thousands	Place value - position of digit	Number words to thousand

BERCS

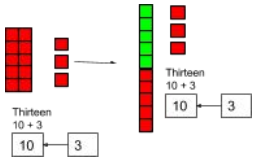
Openers: (#'s 5 - 9/10)

1. **Dot Collections** - Putting up a collection and looking for 5 and then looking for what is left over

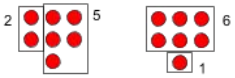


2. **What's covered #1 - 9**

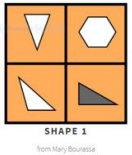
3. **Use the 10 to connect to teen numbers**



4. **Finding the parts of the whole**



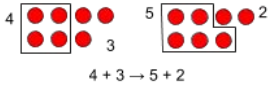
5. **Translating collection into blocks/fingers, etc**
6. **What Doesn't Belong Cards - transfer from Kindergarten**



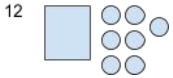
BERCS

Openers:

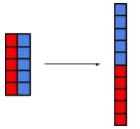
1. **Comparing 2 different ways to see collection**



2. **What's Covered #'s 7 - 18**

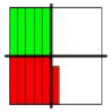


3. **Ten Frames**



The 2 5's need to eventually transition into the linear 10 to connect with the 10 by 10 grid.

4. **Hundred Grids (later in the year)**



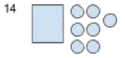
Use a variety of numbers from 20 - 100. Discuss the parts in relationship to addition and tens and ones. See Opener #3 in Grade 3.

5. **Quickdraw**
6. **What Doesn't Belong**

BERCS

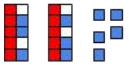
Openers:

1. **What's Covered? #10 - 20**



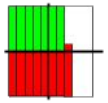
I know 7 and 7 are 14 so there must be 7 covered.

2. **2 Ten Frames → What's Missing?**



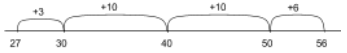
8 + 8 + 5 = 10 + 10 + 1
I moved 2 into the first 10 frame and moved 2 into the second 10 frame and there's one left.

3. **Flash Math - 10 by 10 Grid**



Expressions:
50 + 26 (5 tens 26 ones),
60 + 16 (6 tens 16 ones),
40 + 36 (4 tens 36 ones),
etc. Order the expressions to find a pattern.

4. **Transition to the Open Number Line**



5. **Digits 4 7 5 order , greatest, least, compare**
See Opener #4 in Grade 4 for examples

6. **Finding and describing numbers up to 1000**
See Opener #2 in Grade 4 for ideas

Created by April Brown & Leann Miller with assistance from Geri Lorway @Thinking101 for Peace Wapiti School Division #76

Grade 4

What do your kids need to know?

- Describe a 4 digit number in multiple ways using flexible place value
- Read and write 4 digit numbers in multiple formats
- Use multiplication in their exploration of a four digit number eg. 14 000 is 14 x 1000 or 1000 x 14
- Making the link to a linear measure (number lines) talk about the magnitude of where numbers sit on the number line
- Link to multiplicative reasoning (division & decimals)

What does this look like and sound like when students have achieved these goals?

Probing Questions: How many different ways can you write the number 2578 without using 'hundred'. How many different ways can you write it without using 'thousand'?

Outcomes:

Number 1. Represent and describe whole numbers to 10 000, pictorially and symbolically. [C, CN, V]	2. Compare and order numbers to 10 000. [C, CN, V]
6. Demonstrate an understanding of multiplication (2- or 3-digit by 1-digit) to solve problems by: • using personal strategies for multiplication with and without concrete materials • using arrays to represent multiplication • connecting concrete representations to symbolic representations • estimating products • applying the distributive property. [C, CN, ME, PS, R, V]	9. Represent and describe decimals (tenths and hundredths), concretely, pictorially and symbolically. [C, CN, R, V]

Vocabulary:

Periods	Number words to 10 000	distributive property	Ten thousand
Tenths	Hundredths	Decimal (proper use of and)	Multiplicative reasoning
Magnitude	Strategy	One is a whole number	

Grade 5

What do your kids need to know?

- Automatic recognition of and fluency in expressing number to 10 000 & using that to describe & explain numbers to 1 000 000
- Have to be able to work with what comes before and after (1 000 000)
- Link is seeing area models as multiplication and how it applies to place value
- Get students on the number line and see the idea of multiplying and dividing with tens becomes decimals

What does this look like and sound like when students have achieved these goals?

Probing Questions: (2 x 10 x 10 x 10) + (5 x 10 x 10) + (7 x 10) + (8 x 1)
Two thousands three hundreds 27 tens 8 ones
(1 x 1000) + (15 x 100) + (7 x 10 x 10) + (8 x1)
What do these all have in common?

Outcomes:

Number 1. Represent and describe whole numbers to 1 000 000. [C, CN, V, T] [ICT: C6–2.2]	4. Apply mental mathematics strategies for multiplication. [C, CN, ME, R, V]	5. Demonstrate, with and without concrete materials, an understanding of multiplication (2-digit by 2-digit) to solve problems. [C, CN, PS, V]
8. Describe and represent decimals (tenths, hundredths, thousandths), concretely, pictorially and symbolically. [C, CN, R, V]	10. Compare and order decimals (to thousandths) by using: • benchmarks • place value • equivalent decimals. [C, CN, R, V]	**Shape and Space** 3. Demonstrate an understanding of measuring length (mm) by: • selecting and justifying referents for the unit mm • modelling and describing the relationship between mm and cm units, and between mm and m units. [C, CN, ME, PS, R, V]

Vocabulary:

Number words to a million	Hundred thousand	Million	Thousandths
Equivalent	Distributive property		

Grade 6

What do your kids need to know?

- Practice to get efficiency

What does this look like and sound like when students have achieved these goals?

Probing Questions: What was the question if the answer is 6.15?
What is the question if the answer is 6.150? Compare.

Outcomes:

Number 1. Demonstrate an understanding of place value, including numbers that are: • greater than one million • less than one thousandth. [C, CN, R, T]	2. Solve problems involving whole numbers and decimal numbers. [ME, PS, T] [ICT: C6–2.4]

Vocabulary:

Numbers greater than a million	Numbers less than a thousandth	Whole numbers
Decimal numbers	billions	

Created by April Brown & Leann Miller with assistance from Geri Lorway @Thinking101 for Peace Wapiti School Division #76

BERCS

Grade 4 Openers:

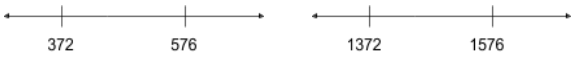
1. **Flash Math with place value word cards - 100s or ten frames**

2. **Number Folder**

		3	4	1	2
Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones

3412
3 thousands 41 tens 2 ones
34 hundreds 1 ten 2 ones
341 tens 2 ones

3. **Comparing on number lines**



4. **Digits 6 7 5 order , greatest, least, compare**

7 6 5 5 6 7 7 > 5 6 < 7 5 < 7

5. **Flip a deck of cards - What's My Number?**

2	7	5	4	9	1

Greatest - 975 421 Least - 124 579 Compare

6. **Referring to the 10 000 model**

BERCS

Grade 5 Openers:

1. **Referring to the 10 000 model**

2. **All openers from Grade 4 incorporating numbers to a million**

BERCS

Grade 6 Openers:

1. **Digits - rearranging to see magnitude**
   4 6 3 7 9 8 3 Greatest - 9 876 433 Least - 3 346 789

2. **Digits - What's the biggest number you can make? Now can you make it without using millions? What would you make now?**
   6 954 632
   6 millions 954 thousands 632 ones
   69 hundred thousands 546 hundreds 3 tens 2 ones
   695 ten thousands 46 hundreds 32 ones
   6954 thousands 6 hundreds 3 tens 2 ones
   69546 hundreds 32 ones

3. **Periods**

		7	5	9	6	8	3
Ten thousands	Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths

759.683
759 ones and 683 thousandths
75 tens 9 ones and 68 hundredths 3 thousandths
7 hundreds 59 ones and 6 tenths 83 thousandths

Mathematics is used to describe and explain relationships. (Alberta Program of Studies pg. 8)
Visual images and visual reasoning are important components of number, spatial and measurement sense.
Brain research establishes and confirms that multiple complex and concrete experiences are essential for meaningful learning and teaching. (Caine and Caine, 1991) (Alberta Program of Studies pg. 5)

Created by April Brown & Leann Miller with assistance from Geri Lorway @Thinking101 for Peace Wapiti School Division #76

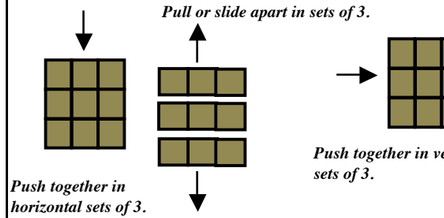
Spatial Reasoning meets Multiplicative Reasoning in the AB Program of Studies

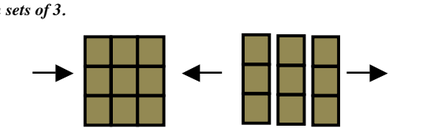
Work supported in part by funding from NRLC, 2016- 2017
Prepared and vetted by Thinking101
Developed in collaboration with GPPSD and PWSD76 coaches

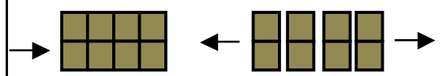
Kindergarten

Represent, describe number 2 to 10, (concrete pictorial). [C, CN, ME, R, V]
Subitize & name familiar arrangements to 5 objects or dots. [C, CN, ME, V]
Compare quantities 1 to 10, using one to one correspondence. [C, CN, V]

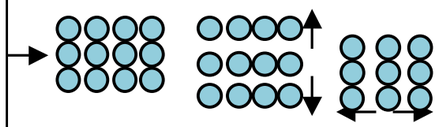
Build and trust units of 2, units of 3.
One way to arrange them is to push equal sets into rectangular arrays.







Focus on the action of sliding into arrays
In equal sets or groups of 2 or 3.
Focus on the action of pulling apart in equal groups.
Fpcus on moving all the sets in one direction. Then all the sets in the other direction. Horizontal, vertical



Slide together sets of threes. Pull apart vertically in threes, horizontally you need another finger. It's fours, not threes.

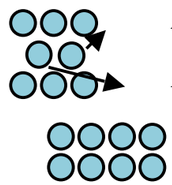
Build Vocabulary

The vocabulary that provides a foundation for multiplicative reasoning can be developed as students describe attributes & positions of objects. Those attributes and descriptors can be used to describe the elements of a pattern or the attributes by which they create a sort. Positional & directional language aids in the development of ALL reasoning including multiplicative. Some important vocabulary includes:

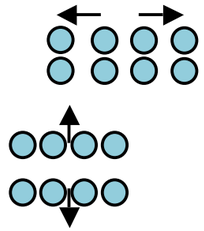
right left up down horizontal vertical slide *(translate)* flip *(reflect)*
rotate *(turn)* to the right to the left on the diagonal upside down
above below random arranged equal spaces equally spaced
row column edge side face area vertex parallel perpendicular
length height depth width perimeter

Build & describe 3D objects.
As students explore, trace, describe and build 3 D objects they are exploring dimensions in 2 and 3 directions.

Grade 1

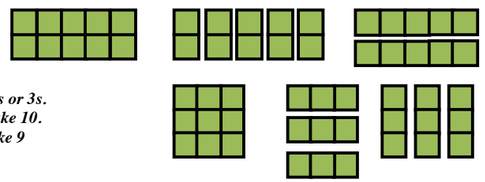


Re-arrange collections into arrays.
I built 5 + 3 then
I slid 2 to change it to 4+4.
I can pull this 8 apart as sets of 4 or sets of 2.



Subitize (recognize at a glance) & name familiar arrangements of 1 to 10 objects or dots. [C, CN, ME, V]
Demonstrate understanding of counting * any set has only one count
*** using parts or equal groups to count sets. [C, CN, ME, R, V]**
Represent and describe numbers to 20 (concrete, pictorial, symbolic [C,CN,V]
Demonstrate an understanding of conservation of number. [C, R, V]

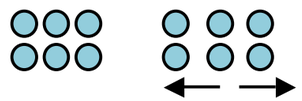
Ten comes apart as 2s or as 5s.



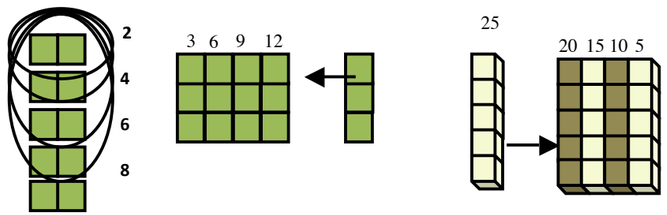
Push tiles in 2s or 3s.
Push 2s to make 10.
Push 3s to make 9

Nine comes apart as threes in both directions.

Six pulls apart as twos in one direction and threes in the other.



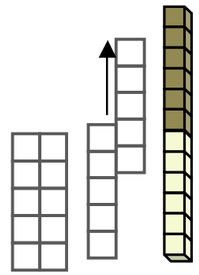
Work with number sequences adds to the foundation for success with multiplication. To support multiplicative reasoning encourage students to attach the sequences to materials.
Say the number sequence to 100: *by 2s to 20 *by 5s, 10s to 100.



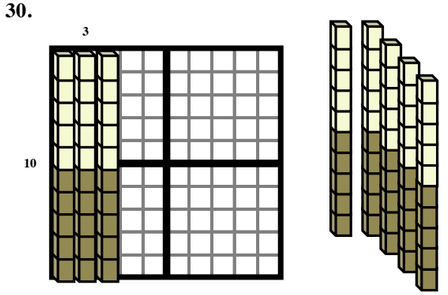
As you say sequences, build them into arrays.
See the growth?
Build in one direction either horizontal or vertical.
Grade ones will count as they build: 2,4,6,8 or 3,6,9

Grade 2

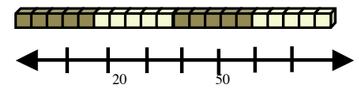
Place value is a multiplicative function. Tens slide into the hundred grid as units that accumulate to 100. As with earlier work, the tens can be arranged vertically or horizontally. Three tens 3 (10) 30.



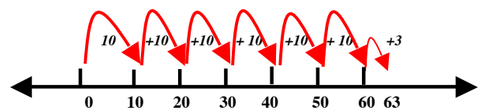
The ten frame, 2 x 5, becomes 1 x 10.
Blocks in fives become lengths of ten.
10 tens fit the 100 grid, Compose and decompose in two directions.

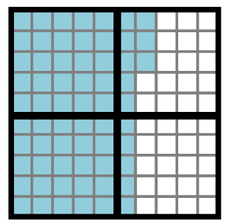


Fill to 10 tens in both directions.

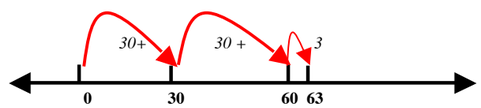


Represent, describe numbers 100, concrete, pictorial & symbolic. [C, CN, V]
Compare & order. [C, CN, ME, R, V]
Illustrate, concrete, pictorial, place value meaning for numerals to 100. [C, CN, R, V]
Say the number sequence 0 to 100 by:
• 5s &10s, forward and backward, using multiples of 5 & 10 [C, CN, ME, R]





The numberline connects additive and multiplicative interpretations. We help students see the addition relationships but do not reduce multiplication to "just addition".



This is an image of 6 (10) + 3
60 + 3
63
Place value is not adding tens. It is multiplying by tens. 10 + 10 + 10 is embedded but not the focus.

Say the number sequence 0 to 100 by:
• 2s, 5s &10s, forward and backward, starting points multiples of 2, 5 & 10 [C, CN, ME, R]

All skip counts are not multiples. ALL multiples are skip counts.
Start at 3 , count by tens (additive thinking) 3, 13, 23, 33, 43
Start at 10, count by tens (multiplicative thinking) 10, 20, 30, 40
Start at 1, count by twos (additive reasoning) 1, 3, 5, 7, 9
Start at 20, count fives could be additive or multiplicative 20, 25, 30, 35,

Kindergarten

Build & describe 3D objects.
As students explore, trace, describe and build 3 D objects they are exploring space in 2 and 3 directions. This is a precursor for 'dimensional' discussions.

Examining, describing, tracing 3D objects introduces learners to the concept of 3 dimensional space and movement in 3 directions.
Students trace faces, describe the attributes of, and practice the vocabulary that applies to 2D shapes and 3D objects.
Understanding how to describe positions and orientations is part of this work.

Note that appropriate vocabulary was made available for students to copy or to cut and paste

These tasks set the stage for multiplicative ideas that students will meet in the higher grades. Area models move in 2 directions. Volume moves in 3 directions.

From Kindergarten to Grade 3, the shape and space outcomes encourage the exploration of 3D objects and how they are composed of, and described with 2D language.

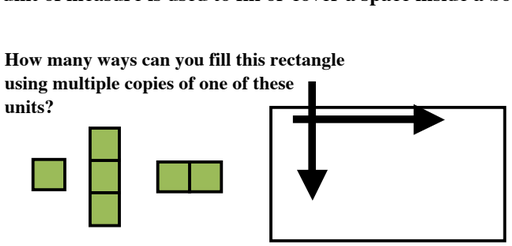
The tracing and exploring you see above should continue into Grades 1 and 2 as students continue to construct and describe objects. The experiences with constructing and mapping 3 D objects prepares them for the thinking and constructing in 2 and 3 directions they will experience with area and volume models in Grades 3 to 5.

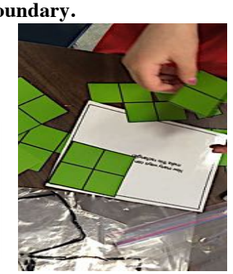
Grade 1

Demonstrate an understanding of measurement as a process of comparing **identifying attributes that can be compared **ordering objects **making statements of comparison **filling, covering or matching. [C, CN, PS, R, V]

A unit of measure is used to fill or cover a space inside a boundary.

How many ways can you fill this rectangle using multiple copies of one of these units?





Filling rectangular areas by repeating copies of a given unit moving in one direction, no gaps prepares students for multiplicative thinking.
Can you predict first? Will there be space left?
Can you see the equal "unit" that grows in the opposite direction. In this example I see 4 running horizontal.

A unit of measure is used to fill or cover a length.
Width, height, depth, perimeter, across, around, circumference are words that specify the direction in which we measure lengths.

Using a non standard unit to build a measuring tool in Grade One is about making sense of how a unit fills a length. The focus is on constructing. Is the unit kept in the same orientation," lined up" one to one, matching (no gaps), Understanding units as part of a unit is an important idea in multiplication. This tool measures five bandage lengths at a time. Find things that are as long as 5 bandages, 3 bandages, 1 bandage. Make statements of comparison.

Replicate composite 2-D shapes and 3-D objects. [CN, PS, V]
Students continue to trace, explore and construct shapes and objects, now seeing how shape is in shape, units are in units. Composing and decomposing congruent shapes (exactly the same). Six triangles make a hexagon.

Demonstrate an understanding of measurement as a process of comparing ** filling, covering or matching. [C, CN, PS, R, V]
The concept of filling can apply to filling the space that represents a length or filling 3D objects to experience what it means to be full, no gaps or spaces. Filling objects like cylinders, prisms, cones and comparing the size and composition of things that "fill" them contributes to the flexible thinking they will demonstrate as they explore volume and capacity in the higher grades.

Movement or growth in 3 directions: layering equal groups

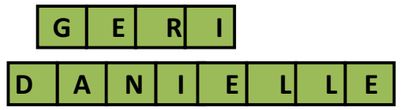
Grade 2

Relate the size of a unit of measure to the number of units (limited to nonstandard units) used to measure length, mass (weight). [C, CN, ME, R, V]
Measure length to nearest nonstandard unit by: • multiple copies of a unit (additive)• single copy of a unit (iterating process) . [C, ME, R, V]

She measured around her wrist. Now she is iterating the unit to compare to the measure around her forehead. Three almost fit. Use both units to measure things. Compare.

One pad is twice as long as the other. Use each length as a unit to measure things. Compare.

.

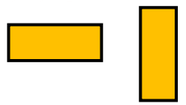


If the unit is one letter, then a GERI is a measure of 4 units.
If the whole name, "Geri" is the unit, then a Geri is a measure of 1 unit. Compare a GERI to a DANIELLE.

Relate number of days to a week and months to a year. [C, CN, PS, R]
A 1 to 7 comparison and a 1 to 12 comparison.
Demonstrate an understanding of increasing numeric patterns [C, CN, PS, R, V].

Demonstrate that changing the orientation of an object does not alter the measurements of its attributes. [C, R, V]

These are both triangles. Position does not affect the naming.

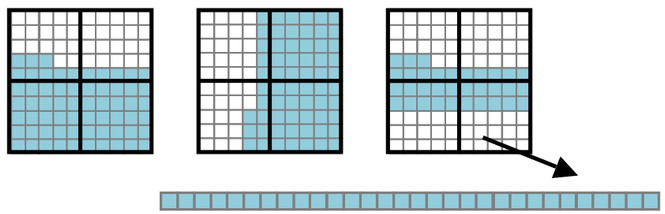


Rectangles do not have to sit in a certain position.

A cylinder is still a cylinder after a turn.

The attribute associated with these models is number. Number represents a measure of quantity. Deliberately change the orientation of the models to demonstrate to students that the quantity being represented is still the same.

Whether you see the ones or the tens first it is still 6 (10) + 3 (1) 6 tens, 3 ones
Stretch it out onto a numberline, it is still 6 (10) + 3 (1)
60 + 3 or 3 + 60



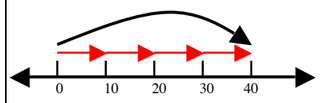
Can you predict the length, so far I have 3 tens

Grade 3

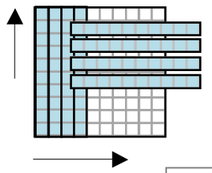
Place value is a multiplicative function. Multiplicative models alluded to in the curriculum include: (Lorway, 2016).

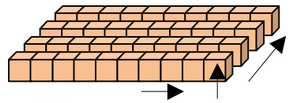
1.) GROWTH IN 1, 2, or 3 DIRECTIONS

4 times as much



4 (10) 4 tens





1*10*4 *Blocks are 3D models They grow in 3 directions*

2.) EQUAL PARTITIONING

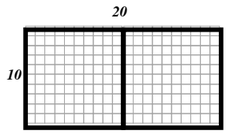
The one could represent 1 m, 1 cm 1mm, 1.0

3.) MULTIPLICATIVE COMPARE

7 days = week ? days = 3 weeks
1 cm = m ? cm = 4 m

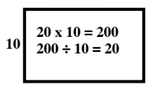
Compare the values of the 7s:
0.7 700 77 0.07

Represent, describe numbers to 1000, *concrete, pictorial, symbolic.* [C, CN, V]
Compare & order. [C, CN, R, V]
Illustrate, *concrete & pictorial*, place value to 1000. [C, CN, R, V]

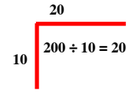


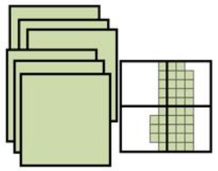
20 tens 200
20 (10)
200÷10 = 20

20 across



20

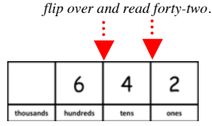




I see 642
6 hundreds 6 (100) 600
3 tens 3 (10) 30
12 ones 12 (1) 12

I can express as 642
600+40+2
4 hundreds 400 4(100)
24 tens 240 24 (10)
2 ones 2 2 (1)

Fold back at hundreds, read 6 hundreds, flip over and read forty-two. 600+42



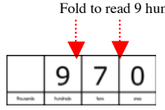
Fold back at the tens, read 64 tens, flip over and read 2 ones. 640+2

Explain:

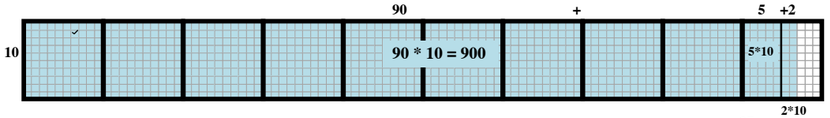
seventy tens
270 ones

70 (10) or 700 700 means 70*10
270 ones means
2 hundreds (200) 7 tens (70)
227 ones is also 270 (1)
I can express 970 as:
6 hundreds, 37 tens 600+370
5 hundreds, 47 tens 500+470

Fold to read 97 tens
Fold to read 9 hundreds

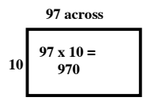


Place 970 in a thousand grid. Describe.
90 (10) + 7 (10) 97 tens 97 (10)
9 (100) + 7 (10)



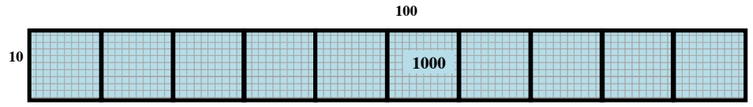
Grade 3 students build and describe numbers to the thousand.
One thousand can be expressed as:
one thousand 1 (1000) 1 x 1000 ten hundreds 10 (100) 10 x 100
one hundred tens 100 (10) 100 x 10 1000 (1) or 100 x 1

97 across



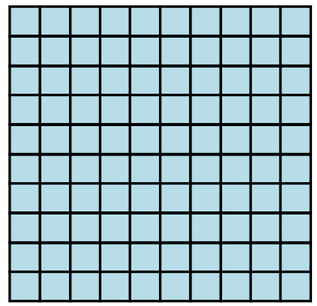
Grade 4

Represent and describe whole numbers to 10 000, pictorially & symbolically.
Compare and order number to 10 000. [C, CN,V]
Apply the properties of 1 for multiplication & division.
Identify, describe, explain, extend, translate patterns using charts & tables.

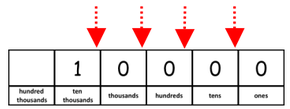


*Ten thousand will be ten times as many as the thousand. It will not fit the page. 10 * 1000 can also be modeled as 100 * 100. Students build and compare both.*

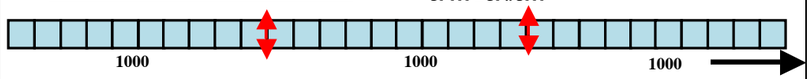
Not to scale
10 000 = 100 x 100

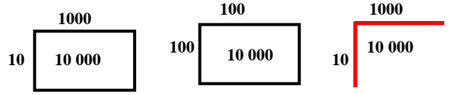


one ten thousand	1 (10 000)	1*10 000
ten one thousands	10 (1000)	10*1000
one hundred hundreds	100(100)	100*100
one thousand tens	1000(10)	1000*10
ten thousand ones	10 000(1)	10 000*1



Not to scale
10 000 = 10 x 1000

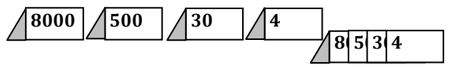




Explain:

7 (1000)
15 (100)
3 (10)
4(1)

7000	7 thousands	7 (1000)	7 (10*100)
1500	15 hundreds	15 (100)	15* (10*10)
30	3 tens	3 (10)	3*10
4	4 ones	4 (1)	4*1



Students are encouraged to see and describe connections between the words and multiplicative expressions used to describe 3 and 4 digit numbers and the number expander cards that allow them to see and read the place value units. The ability to flexibly decompose number forms the foundation for success with estimations and calculations.

Which number has more tens?

7394
7493
Compare Cards

seven thousands 7(1000)
39 tens 39 (10)
4 ones 3(1)
7000+390+4 = 7394

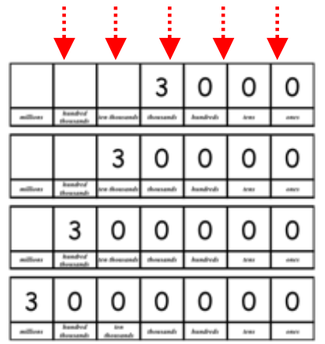
7 thousands 7 (100*10)
2 hundreds 2(10*10)
19 tens 19 (10)
4 ones
7000+200+190+4=7394

seven thousands 7(1000)
49 tens 49 (10)
3 ones 3(1)
7000+490+3 = 7493

7 thousands 7 (100*10)
2 hundreds 2(10*10)
29 tens 29 (10)
3 ones
7000+200+290+3=7394

Grade 5

The Grade 5 outcomes assume students can generalize from their understandings of place value to 10 000 to represent and describe numbers to one million. Build the ten thousand with the class. Use it as a reference working with the hundred thousand and million. Estimation strategies are built from a robust imagery for number. The model, the expanders, using words and multiplication 'units' all contribute to number sense.



Read 3 thousand, Fold, read 30 hundreds. 30 (100).
Fold read 300 tens 300 (10).

Read 3 ten thousands.
Fold, read 30 thousands. 30 (1000).
Fold, read 300 hundred hundreds, 300 (100).
Fold, read 3 thousand tens. 3000 (10)

Read 3 hundred thousands.
Fold, read 30 ten thousands. 30 (10 000).
Fold, read 300 thousand, 300 (1000).

Fold, read 3 thousand hundreds. 3000 (100)
Do you see the pattern for 3 million?

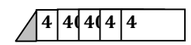
Represent and describe whole numbers to 1 000 000 [C, CN, V, T]
Use estimation strategies in problem-solving contexts. [C, CN. ME, PS, R, V]

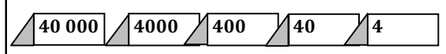
Explain:

4 ten thousands
40 hundreds
forty-one tens
thirty-four

4 (10*1000) = 4 (10 000) 40 000
40 (10*10) = 40 (100) 4000
41 (10) = 41 x 10 410
34 (1) = 34 x 1 or just 34
40 000 + 4 000 + 410 + 34
44 444

4 (10*1000) = 4 (10 000) 40 000
40 (10*10) = 40 (100) 4000
41 (10) = 41 x 10 410
34 (1) = 34 x 1 or just 34
40 000 + 4 000 + 410 + 34
44 444





Fold at the hundreds. Read 444 hundreds (444 (100) = 44 400).
Fold at the tens. Read 4 444 tens 4444 (10) = (44 440).
Fold at the thousands. Read 44 thousands (44 000
Fold at the ten thousands. Read 4 ten thousands (40 000).

Explain:

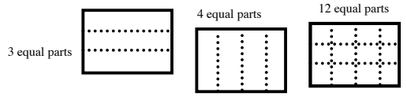
202 (100*10)
740 (10*10)
93 (10)
9 (1)

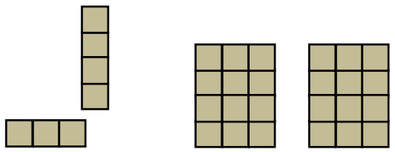
202 (100*10)	202 (10 000)	202 000	202 thousands
740 (10*10)	740 (100)	74 000	740 hundreds
93 (10)	93 * 10	930	93 tens
9 (1)	9 * 1	9	9 ones

two hundred seventy-six thousands, 9 hundred, thirty-nine	276 939
270 thousands, 69 hundreds, thirty-nine	270 000 + 690 + 39
2 ten thousands, 250 thousands, 693 tens, 9 ones	20 000 + 250 000 + 6930 + 39

While addition is related to multiplication, it is important that learners understand multiplication creates a proportional change. Area models highlight both equal groups (units) and a directional and proportional growth or shrinkage.

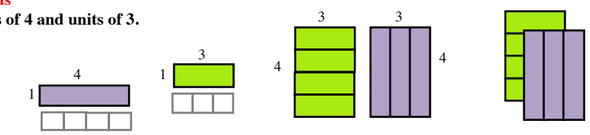
1.) Paper folding. A pre task that can be explored at any grade level. **Folding in two directions sets the stage for making sense of the two dimensional nature of multiplication in an array.**



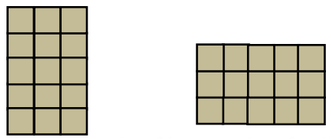


2.) Tiles and Grids
Physically build arrays with "groups of tiles". Cut out with grid paper. Arrays can be built in two directions.
This is four 3s or three 4s.

3.) Cuisenaire Rods
The rods are units of 4 and units of 3.

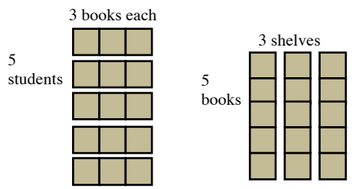


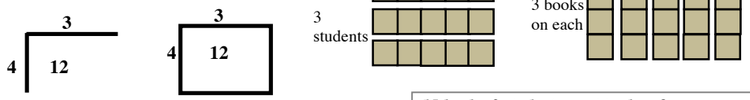
Demonstrate an understanding of multiplication to 5 x 5 by:
****representing & explaining *using equal grouping and arrays***
****model using concrete & visual representations, record the process symbolically**
****relating to repeated addition **relating to division. [C, CN, PS, R]**



The commutative property allows 2 interpretations of multiplication therefore two related divisions for each "fact". 3 x 5 = 5 x 3 3 x 5 = 15 and 5 x 3 = 15.

15 books, 5 students want to share?
How many books each?
15 books, put 5 on each shelf, how many shelves?

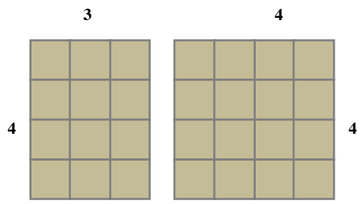


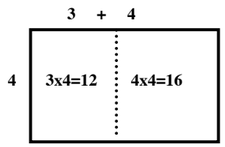


Two representations for multiplication and division

15 books, 3 students want to share?
How many books each?
15 books, put 3 on each shelf, how many shelves?

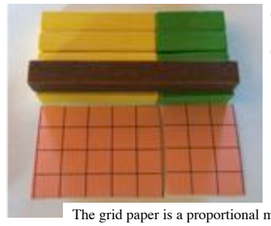
If students have solid mental imagery for the "facts" to 5 x 5 as arrays they can learn the distributive property as they build facts to 81.





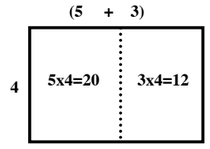
(3 + 4) 4 is the same as 7 x 4.
I can solve this by (3x4) + (4x4).
(3 + 4) 4 = 7 x 4
(3 + 4) 4 = (3x4) + (4x4)
7 x 4 = 12 + 16
7 x 4 = 18

Describe and apply mental mathematics strategies to determine basic multiplication facts to 9 x 9 and related division facts. [C, CN, ME, R]
Recall facts to 7 x 7.
(Mental strategies are based on number properties. The curriculum specifically names distributive property in Grades 4 & 5)



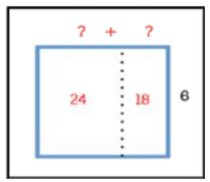
The grid paper is a proportional model that matches the rods

The rods demonstrate
(5 + 3) 4 = 8 x 4
The 8 rod is my proof.

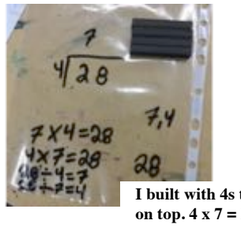


(5+3) 4 = 8 x 4
(5+3) 4 = (5x4) + (3x4)
(5x4) + (3x4) = 20 + 12
8 x 4 = 32
This area model represents the model. It's a sketch, not an exact duplicate.

Relate Division

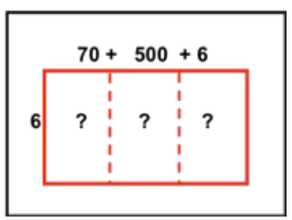


The puzzle reads (? + ?) 6.
I could write 24 ÷ 6 and 18 ÷ 6 and add them together.
I know 3*6 = 18 and 4*6 = 24
(? + ?) = 3 + 4
This is 7 x 6 = 42
24 ÷ 6 = 4 and 18 ÷ 6 = 3



I built with 4s to 28 then put 7s on top. 4 x 7 = 28

Demonstrate an understanding of multiplication (2-3 digit by 1 digit) to solve problems by:
****use of personal strategies with & without concrete materials**
****use of arrays **connecting concrete to symbolic representations**
****applying the distributive property [C, CN, ME, PS, R, V]**

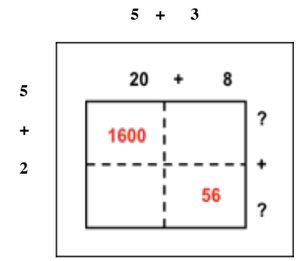


(70+500+6) = 576
576 * 6 = (500*6) +(70*6)+(6*6)
= 3000 + 420 + 36
=3456
If 576*6 = 3456 then
3456 ÷ 6 = 576 and 3456 ÷ 576 = 6

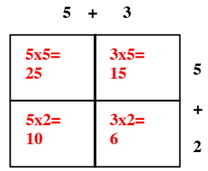
Apply mental math strategies and *number properties* in order to understand and recall basic multiplication facts to 81 & related division facts. [C, CN, ME, R, V]

Understand and recall to 9x9.

Area models illuminate the distributive and commutative properties. Students practice properties as they praatice multiplication and addition facts.



(5+3) (5+2) = 8 x 7



This image of 8 x 7, pulled directly from the times table can be used to demonstrate and practice the distributive property. The referent lines break 8 into 5+3 and 7 into 5+2. Students are practicing facts, mental addition and building their understandings of distribution as they decompose and recompose multiplication this way.

(5+3) (5+2) = (5x5)+(3x5)+(5x2)+(3x2)
8 x 7 = 25 + 15 + 10 + 6 (add mentally)
8 x 7 = 56

Challenge students to push themselves to see it their mind, gradually building their ability to apply distribution as a mental strategy, not worked out on paper.

Demonstrate, with & without concrete materials, an understanding of multiplication (2 digit by 2 digit) to solve problems. [C, CN, PS, V]

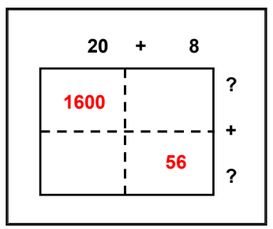
Solve 48 x 64

48 x 64 = (40+8) (60+4)

	40	*+8*
60	2400	480
+4	160	32

These are all variations of the same strategy. Can you explain how they are related?

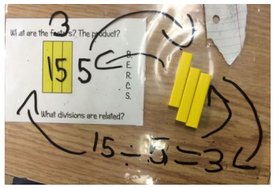
48	48	64
x64	x64	x48
32	192	512
160	2880	2560
480		
2400		

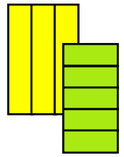


How would you solve this challenge puzzle?

Demonstrate an understanding of division by:
****representing & explaining using *equal sharing and equal grouping***
****model *equal sharing and equal grouping* concretely, visually then record**
****relating to repeated subtraction **relating to multiplication.**
[C, CN, PS, R]

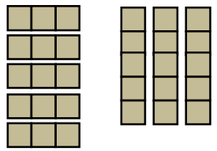
Area models support the connection to division as ***equal groups and as equal sharing***.





By the commutative property, I can also build this array using threes. That allows me to show the other division fact

Students can demonstrate this same relationships by cutting or folding grid arrays.



Build 15 as 3 x 5 array and demonstrate how it can be taken apart as threes or as fives.

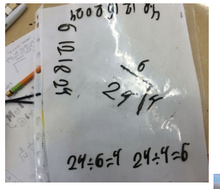
3 books each
5 students
5 books
3 shelves

15 books, 5 students want to share?
How many books each?
15 books, put 5 on each shelf, how many shelves?

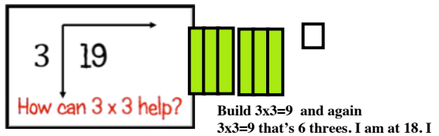
3 on each
5 shelves
5 each
3 students

15 books, 3 students want to share?
How many books each?
15 books, put 3 on each shelf, how many shelves?

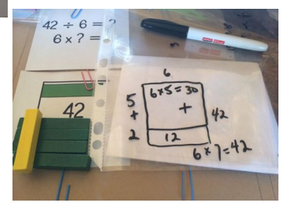
Demonstrate an understanding of division (1-digit divisor, 1or2 digit dividend) to solve problems by:
****using personal strategies with and without concrete materials**
****estimating quotients ** relating to multiplication**

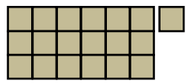


Think of related multiplication facts, then build or explain the relationship



Build 3x3=9 and again 3x3=9 that's 6 threes. I am at 18. I have one left.
One third of what I need for another group of 3.





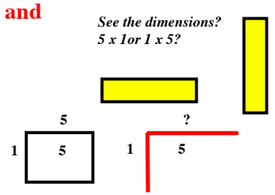
3x6=18
1 more is 19.
Build it with grid arrays.

Apply the properties of 0 and 1 for multiplication and the property of 1 for division. [C, CN, R]

I folded a 4x3 to highlight units of 3 and units of 4.

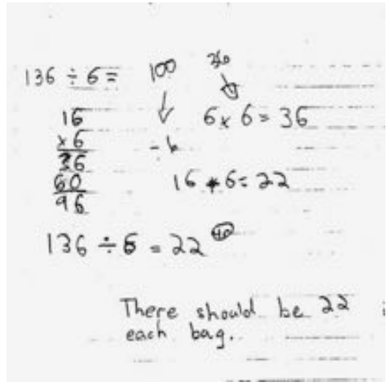
I see 3 units that are 4 x 1
I see 4 units that are 3 x 1

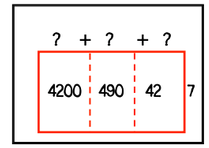
See the dimensions?
5 x 1or 1 x 5?



What would a unit of 0 look like?
What would a 0 length rectangle look like?

Demonstrate, with and without concrete materials, an understanding of division (3-digit by 1-digit) and interpret remainders.



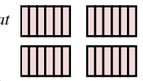


I see 4200 ÷ 7. I think 7 x ? = 4200 7 x 600
I see 490 ÷ 7. I think 7 x ? = 490 7 x 70
I see 42 ÷ 7. I think 7 x ? = 42 7 x 6

The distribution was (600 + 70 + 6) 7 = 676 x 7
The division was 4732 ÷ 7 = 676

I want to share 136 candies with 6 students. The student had 4 left and explained that you could divide the 4 into 6 pieces each but would it be worth it. Each person would get one sixth of each candy.

These are the 4 candies that are left.
You can break them apart.
Each person gets one sixth of each candy.



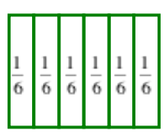
345 ÷ 7 means
300 ÷ 7 and 45 ÷ 7
I know 7x40=280 and 7x2=14
therefore 7x42= 294. There are 6 left.
I can add them to 45.
51÷7, I think 7x7 = 49 and a remainder of 2.
Two of the seven or 2/7.
The answer is 49 and 2/7.

Demonstrate an understanding of fractions by:
****explaining that a fraction represents a part of a whole**
****describing situations in which fractions are used**
****comparing fractions of the same whole that have like denominators**

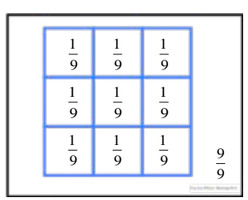
First I made sixths by folding like a fan, back and forth. Then I took the same size paper and folded to have 3 cross 2.
See the image of an array?

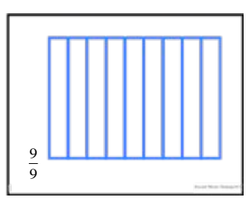
$\frac{6}{6} = 1$

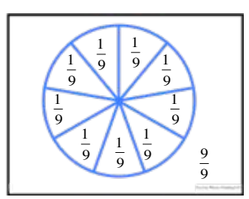
$1 \div 6 = \frac{1}{6}$



Fractions are divisions.

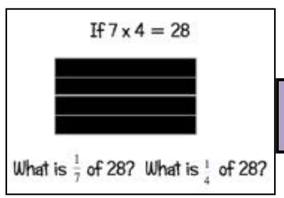






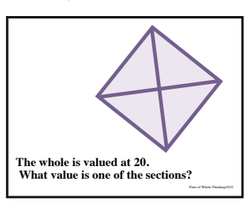
Three ways to partition to have ninths. The image on the left clearly demonstrates the crossing of "units" we saw in the arrays for whole numbers. Related fractions are visible.

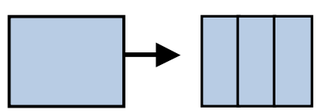
Demonstrate an understanding of fractions less than or equal to one by using concrete, pictorial & symbolic representations to:
****record & name fractions for parts of a whole or part of a set**
****compare & order**
****model & explain for different wholes, two identical fractions may not represent same quantity [C, CN, PS, R, V]**



…then 4 x 7 also equals 28.
I could build this fact with 4 rods.

Can you see the diagram in your head. If the whole is 28, one fourth is a 7 rod and one seventh is a four rod. The 28 is divided into 7 parts vertically and 4 parts horizontally.

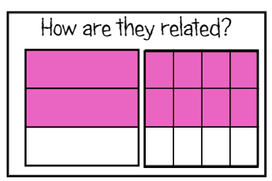




If this diagram represents one paper, then each section is one third.
But if this diagram represents 12, then each section is worth 4.
Do you see how area models led me here?
I know 3 x 4 = 12, it's like an array.

An understanding of equivalent fractions includes the ability to explain how multiplication and division are related to fractions. This understanding has been building since Grade 3 if we follow the outcomes.

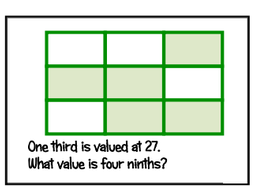
Demonstrate an understanding of fractions less than or equal to one using concrete, pictorial & symbolic representations to:
****create sets of equivalent fractions**
****comp are fractions with like and unlike denominators [C, CN, PS, R, V]**



In the first diagram the square is divided into 3 equal parts. It shows thirds.
In the second diagram the thirds have been divided into 4 equal parts.
Fractions are embedded in fractions

$\frac{2}{3} = \frac{8}{12}$

The diagram is divided into ninths.
One third is 3/9 and that means one ninth is nine because 3 x 9 = 27.
So four ninths will be 36 or 4 x 9.



Grade three outcomes around passage of time all relate to the development of ratio. The relationships include 1:24, 1:7, 1: 60, 1: 365. While the intent of the outcomes is not to develop formal understandings of ratios, the foundation is being laid for this kind of comparative thinking. If one week is 7 days, how many days in 2 weeks, 3 weeks.

Relate the number of seconds to a minute, the number of minutes to an hour and the number of days to a month in a problem-solving context.
[C, CN, PS, R, V]

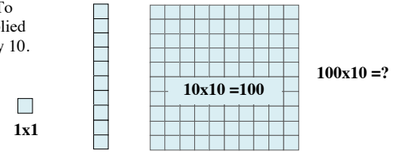
Relate the passage of time to common activities, using nonstandard and standard units (minutes, hours, days, weeks, months, years). [CN, ME, R]

Represent and describe decimals ($10^{ths}100^{ths}$) concretely, pictorially, symbolically. [C, CN, R, V]
Relate decimals to fractions, fractions to decimals. $10^{ths}100^{ths}$

Decimals are an extension of the place value system. To move forward in the system we started at 1 and multiplied by ten. Each new unit is the result of multiplication by 10.

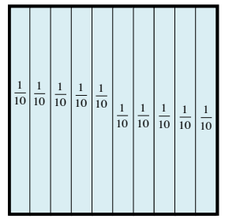
To create decimals we

Magnifying the "one" helps students see the pattern that dividing by 10 creates.



$\frac{10}{10} = 1$

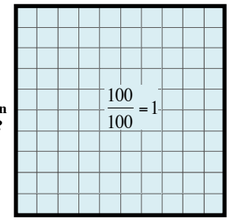
1÷10= $\frac{1}{10}$



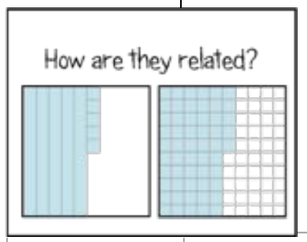
1 ÷ 10 = 0.1

Divide each tenth into ten equal pieces to create hundredths. Can you still see the tenths?

$\frac{10}{100} = \frac{1}{10}$



1÷100= $\frac{1}{100}$ **1 ÷ 100 = 0.01**



$\frac{5}{10} + \frac{5}{100} = \frac{50}{100} + \frac{5}{100}$	**55 hundredths**
0.5 + 0.05 = 0.50 + 0.05	**5 tenths, 5 hundredths**
5 tenths, 5 hundredths	**0.55**
5 (0.1) + 5 (0.01)	$\frac{55}{100} = \frac{50}{100} + \frac{5}{100}$
They are equal. One shows tenths but it is still equal	

4 tenths
23 hundredths

0.4 = 0.40	**4 tenths = 40 hundredths**
40 hundredths + 23 hundredths = 63 hundredths	
0.40 + 0.23= 63	**40 (0.01) + 23 (0.01) = 63 (0.01)**
$\frac{4}{10} + \frac{23}{100} = \frac{40}{100} + \frac{23}{100}$	**3 tenths, 33 hundredths**
6 tenths, 3 hundredths	**0.6 + 0.03 = 0.63**
0.5 + 0.13 = 0.63	**0.43 + 0.2 = 0.63**

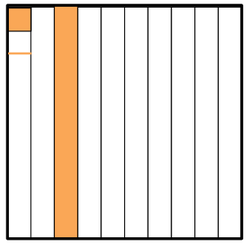
Demonstrate an understanding of addition & subtraction of decimals by:
****using personal strategies to determine sums & differences **estimating**
****using mental mathematics strategies... to solve problems. [C, ME, PS, R, V]**
Strategies for adding and subtracting emerge as students describe and explain decimals using flexible place values and area models.

The division imagery continues as students see thousandths embedded in the hundredths, embedded in the tenths.

Describe and represent decimals ($10^{ths}100^{ths}1000^{ths}$) concretely, pictorially, symbolicaly. [C, CN, R, V]
Relate decimals to fractions, fractions to decimals [CN, R, V]
Compare and order decimals using:
**** benchmarks**
**** place value**
**** equivalent decimals [C, CN, R, V]**

Match the decimal fractions to their fraction equivalent, then match each to the diagram and position on the numberline.

0.01, 0.001, 0.1, 0.010 $\frac{1}{10}, \frac{1}{100}, \frac{10}{1000}, \frac{1}{1000}$



98 hundredths
19 thousandths

3 (0.1)
67 (0.01)
7 (0.007)

0.98 + 0.019
9 tenths, 9 hundredths, 9 thousandths
0.999
97 hundredths, 29 thousandths

		9	8 1	9	
tens	ones	tenths	hundredths	thousandths	10 thousandths

What would each of these deimal fractions look like un a hundredth grid?

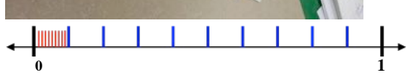
$\frac{67}{100} = \frac{6}{10} + \frac{7}{100}$ $\frac{6}{10} + \frac{3}{10} = \frac{9}{10}$

0.3+0.67+ 0.007+ = 0.3+0.6+0.07+0.007
3 tenths, 67 hundredths, 7 thousandths
0.977
9 tenths, 7 hundredths, 7 thousandths
9 tenths, 77 thousandths

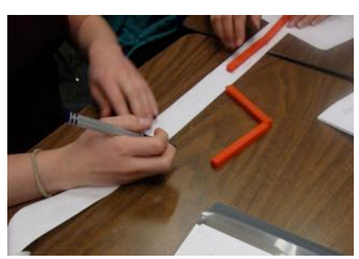
Demonstrate understanding of addition & subtraction of decimals, limited to thousandths. [C, CN, PS, R, V]
Describing decimals in a variety of ways that highlight flexible "place value" groupings builds a robust number sense that students can apply when they move to operations with decimals. The relationship between the units is multiplicative.

Demonstrate an understanding of measuring length by:
**** modeling and describing the relationship between the units cm, m**
**** measuring and recording length, width, height [C, CN. ME, PS, R, V]**

Students start with a metre and fold into ten, then into ten to demonstrate the link to division. 1 metre divided into 100 equal parts equals cm. Or 1 metre divided into 10 equal parts which are then divided into 10 equal parts equals cm.

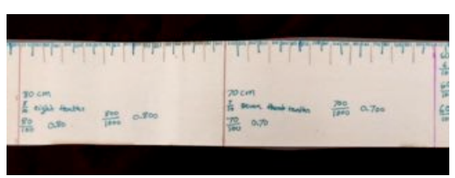


The relationship between 1 metre and 1 cm is multiplicative.



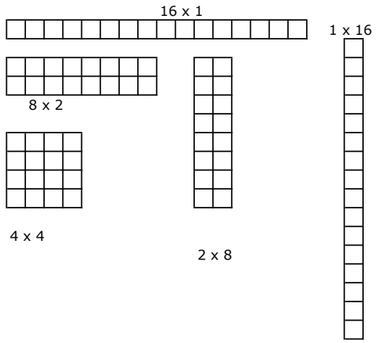
Demonstrate an understanding of measuring length by:
**** modeling & describing the relationship between mm & cm units and mm & m.**

If the 1 represents a metre, where will you place 1 mm?



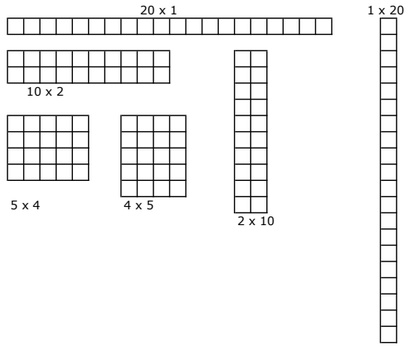
If the metre is the 1 whole and 100 cm fit in the whole, what decimal fraction describes
1 cm? 5 cm? What decimal fraction describes 1 mm? 10 mm? How do you move from mm to cm? From mm to m?

Students investigate with tiles and grid paper.
How many rectangles with area 16 square cm can you find?
Organize the data. What patterns do you see?
Can you generalize from the data? Now try an area of 20 square cm.
When would it be important to know how dimensions affect the shape of an area?



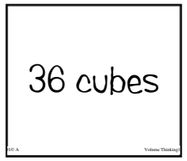
Dimensions	Area
1x16	16 square cm
2x8	16 square cm
4x4	16 square cm
8x2	16 square cm
16x1	16 square cm

Demonstrate an understanding of area of regular and irregular 2D shapes by:
**** recognizing that area is measured in square units**
**** selecting and justifying referents for the units of cm^2 m^2**
**** estimating area, using referents for the units of cm^2 m^2**
**** determining and recording area (cm^2 m^2)**
**** constructing different rectangles for a given area in order to demonstrate that many different rectangles may have the same area [C, CN, ME, PS, R, V]**



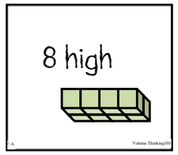
Dimensions	Area
1x20	20 square cm
2x10	20 square cm
4x5	20 square cm
5x4	20 square cm
10x2	20 square cm
20x1	20 square cm

Demonstrate an understanding of volume by:
**** selecting and justifying referents for the units of cm^3 m^3**
**** estimating volume, using referents for the units of cm^3 m^3**
**** measuring and recording volume (cm^3 m^3)**
**** constructing right rectangular prisms for a given volume. [C, CN, ME, PS, R, V]**



Using link cubes, how many different prisms can you build that have a volume of 36 cubes. Will the result be different if you use cm cubes? Explain how

Can you describe & diagram the prism this diagram is suggesting. How would you explain its volume?

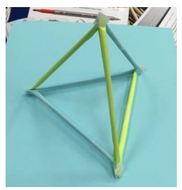


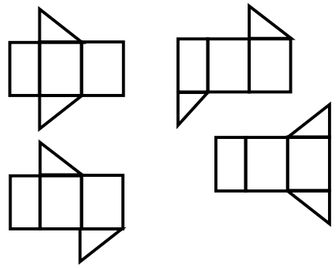
The small cube in the Dienes blocks (place value blocks) is 1 cubic centimeter. How would you prove that?
How many would you need to build a cubic metre or m^3.
Describe a strategy for building the metre cube with cm cubes.

Describe and construct right rectangular and right triangular prisms.

Constructions of prisms fall into 2 large categories: skeletons and nets.

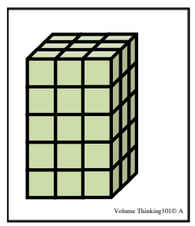
Which of these constructions represents a triangular prism? Explain your thinking.

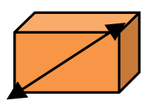




Are these nets that will fold to create the same triangular prism? Can you explain without building either one?

Construct this prism.
Describe your strategy.





Can every right rectangular prism be split into 2 right triangular

Demonstrate an understanding of capacity by:
**** selecting and justifying referents for mL or L units**
**** estimating capacity, using referents for mL or L**
**** measuring and recording capacity (mL or L) C, CN, ME, PS, R, V]**

If you drop 10 centimetre cubes into a test tube of water, the water will rise 10 ml. Can you use this information to build a container that has a capacity of one L?

One thousand to one is the ratio for ml to L. Can you begin to imagine the difference?

Alberta Home & School Councils' Association | Alberta School Boards' Association | Alberta Teachers' Association | Association of School Business Officials of Alberta | College of Alberta School Superintendents | Alberta Post-Secondary Institutions | Alberta Education

Appendix D

Alberta Regional Consortia

Elementary Mathematics Professional Learning

August 31, 2017

Final Report

Grant 2015-0141

Submitted to Alberta Education

prepared by

Karen Egge
Northwest Regional Learning Consortium
10127 – 120 Avenue
Grande Prairie, AB, T8V 8H8
karen.egge@gppsd.ab.ca

Madeleine Lemire
Consortium Provincial Francophone
Suite 200, 4800 Richard Road SW
Calgary, AB, T3E 6L1
mlemire@cpfpp.ab.ca

Pat Bohnet
Central Alberta Regional Consortium
4210-59 Street
Red Deer, AB T4N 2M9
pbohnet@carcpd.ab.ca

Central Alberta Regional Consortium | Southern Alberta Professional Development Consortium | Learning Network Educational Services | Consortium provincial francophone | Edmonton Regional Learning Consortium | Calgary Regional Consortium | NRLC Regional Learning

October 15, 2017

Greg Wondga
Director; Mathematics, Arts and Communication Branch
Programs of Study and Resources
Student Learning Standards | **Alberta Education**
8th Floor, 44 Capital Blvd.
Edmonton, AB

Dear Greg,

Enclosed is the Final Report for the ARPDC Elementary Mathematics Professional Learning grant 2015-0141.
This project aimed to provide:

- Building greater teacher efficacy through opportunities to enhance and develop the personal content expertise of teachers.
- Assistance for teachers in further developing their ability to assess student mastery of skills and concepts, enhancing teacher ability to recognize and quantify student growth.
- Additions and refinements to
- Teacher's personal instructional practices, enhancing their ability to choose appropriate activities and resources.

Our mandate was to fund the development and delivery of six comprehensive learning modules, each containing a series of learning opportunities to support teachers in the effective implementation of the current *Alberta Kindergarten to Grade 9 Mathematics Program of Studies.* The learning modules would be developed in collaboration with Key stakeholders including ATA, AAC, post-secondary professors and the Alberta Regional Professional Development Consortia.

We are delighted to share the journey with you in the following report summary.
Check out the learning portal http://learning.arpdc.ab.ca

Sincerely,

Karen Egge, Executive Director

Background:

This grant was provided in March 2015 to support the Minister's wish to offer professional learning for teachers in the effective implementation of the current Alberta Kindergarten to Grade 9 Mathematics Program of Studies with a focus on the basics as well as the 21st century competencies. The target audience for this grant was Elementary (Grades1-6) teachers. With a variety of partners, including: The Alberta's teachers' Association and the Alberta Assessment Consortium as well as post-secondary partners (Mount Royal University, the University of Lethbridge, the University of Alberta, the Northern Alberta Institute of Technology, and the Southern Alberta Institute of Technology).

Description and project timeline

Professional Learning Opportunities Planning and Oversight Group

The scope of this learning project was intentional in designing opportunities for various organizations to come together and bring their voice and knowledge to the work in the early stages and as the work progressed through the various design and implementation phases led by the Alberta Regional Professional Development Consortia.

In the Terms of Reference it was agreed the overarching focus and role was for the group to provide strategic advice to the Executive Directors of Programs of Study and Resources, French Education Services and Professional Assessment on these professional learning opportunities. External members, who represent their organizations, are expected to communicate and raise awareness of this project with members of their organizations.

Through the four planning and oversight group meetings the participants provided advice on the specific topics recommended by the development teams and received updates on participation numbers and access to the EMPLO resources developed and located on the ARPDC Moodle. Their feedback was much appreciated by the ARPDC Executive Directors and truly influenced the work and success of the project.

Development Teams

There were several teams created to lead and to support the development work.
ARPDC staff participated in an internal working group. Their role was to plan, prepare, and coordinate the work of the development teams as well as all aspects of creating the online site.

Smaller development teams were each of the three modules of study: Operations, Assessment, and Instructional practice. These teams were composed of representatives of the Alberta Teachers Association (Classroom teachers), Alberta Assessment Consortium (Consultant led the Assessment team), and post-secondary subject matter experts (instructors, professors, and researchers)

Below is a general timeline for these teams:

Group or Team	Date	Focus
Internal working group	April 1st, 2015	Establish Framework for development teams
Development team (large group)	April 8th 2015	Establish Development team subgroups and roles and responsibilities.
Development teams (small groups – Operations, Assessment and Instructional Practice)	April –September 2015	Teams collaborated on the development of their respective modules over this time period. Face-to face and online meetings were held.
Internal working group	June 1 & 2 2015	The internal working group came together to review the timeline, the set-up of the online course and to establish dates for further development work and consultations
Development teams (large group)	September 8 2015	All development team members came together to review the terms of reference, working norms, the scope of the project, and the smaller development teams were given the opportunity to share the work completed. Time was given to the smaller teams to share and review work that had been accomplished as well as to establish working dates, times and process moving forward.
Development team Operations	September 2015 - January 2016	The team collaborated on the development of their respective module over this time period. Face-to face and online meetings were held. All materials were prepared in French and English including the Foundational webinars and placed on the ARPDC Learning Portal.
Development team Assessment	September 2015 - February 2016	The team collaborated on the development of their respective module over this time period. Face-to face and online meetings were held. All materials were prepared in French and English including the Foundational webinars and placed on the ARPDC Learning Portal.
Development team Instructional Practice	September 2015 - May 2016	The team collaborated on the development of their respective module over this time period. Face-to face and online meetings were held. All materials were prepared in French and English including the Foundational webinars and placed on the ARPDC Learning Portal.

Delivery

The following presents the outline for the delivery of the provincial foundational webinars. It is important to note that all of the modules related to online support materials were also created and made accessible on the Learning Portal in both French and English on this timeline.

Content Equality Operations – Additive Thinking Operation – Multiplicative Thinking	 November 2015 January 2016 January 2016
Assessment	February 2016
Instructional Practices	May 2016

Budget update:

Area	Grant Allocations	Expense
Development 2014-2017	408,763.72	
	Development Team Supports	184,801.96
	Development Facility Support	4,495.81
	Professional Support	139,679.20
	Development Resources & Supplies	83,782.35
	sub total	412,759.32
Delivery	580,000.00	
	Project Management	100.000.00
	Delivery of LO (ARPDC)	395,150.93
	Regional Delivery of LO (NRLC)	41,539.11
	Facility & Participant Expense	8,881.53
	Technology Supports	33,774.93
	Program Material & Supplies	518.50
	Partner Supports	135.00
	sub total	580,000.00
Support for Provincial Planning Group	20,000.00	
	Provincial Planning Expense	14,775.90
	Provincial Planning Supports	1,228.50
	sub total	16,004.40
	1,008,763.72	1,008,763.72

Reporting:

Provincial Webinars:

2015 - 2016		
Title	Participants (Synchronous)	Participants (Asynchronous)
Understanding Equality	133	463
Le concept d'égalité	38	35
Additive Thinking	127	128
La pensée additive	27	38
Multiplicative Thinking	101	164
La pensée multiplicative	12	32
Assessment	61	41
L'évaluation	12	4
Totals **(June 30th, 2016)**	**511**	**906**

2016-2017	
Title	Participants (Synchronous)
Appuyer le développement de la pensée additive grâce à l'évaluation formative M-3	11
Appuyer le développement de la pensée additive grâce à l'évaluation formative 4-6	5
Supporting the development of additive thinking through formative assessment K-3	7
Supporting the development of additive thinking through formative assessment 4-6	9
Supporting the development of multiplicative thinking through formative assessment 3-6	11
Totals **(February 2, 2017)**	**43**

Regional follow-up and support:

2015-2016	
Consortium	Number of Participants
CPFPP	160
CPFPP & CRC	125
CRC	329
CARC	437
NRLC	123
SAPDC	895
LNES	300
ERLC	171
TOTAL	**2540**

2016-Present	
Consortium	Number of Participants
CPFPP	111
CPFPP & CRC	--
CRC	713
CARC	731
NRLC	204
SAPDC	494
LNES	840
ERLC	717
TOTAL	**3810**
TOTAL PERCENT INCREASE	**+50%**

Learning Portal Access:

2015-2016	
Consortium	Number of Participants
August, 2015	25
September, 2015	293
October, 2015	625
November, 2015	1935
December, 2015	2947
January, 2016	5144
February, 2016	4228
March, 2016	2523
April, 2016	2623
May, 2016	2353
June, 2016	2126
July, 2016	1575
TOTAL	**26397**

2016-2017	
Consortium	Number of Participants
August, 2016	1681
September, 2016	2745
October, 2016	4914
November, 2016	3655
December, 2016	2652
January, 2017	3577
February, 2017	4115
March, 2017	3861
April, 2017	2516
May, 2017	4009
TOTAL	**33725**
Total Percent Increase	**+49%**

Summary

The Learning Portal underwent many updates for resources, links to research, and curriculum clarifications. A presentation section was added in order to support presenters when speaking about these topics. The activities provided within these presentations were also added to the resource section of the applicable topics.

French translations for all resources and activities occurred concurrently with the development of all documents.

Twitter was used to share research, ideas and activities and to communicate with followers.

In order to ensure that future curriculum changes would not make the Learning Portal outdated, information was organized around central ideas.

The Elementary Mathematics Professional Learning project, the Learning Portal and all of its resources were shared throughout the province during sessions, conmmunications and social media.

Comments from the field: "Something I will share with staff…"

- Instruction Practices ➔ "Potential Misunderstandings.pdf"
- Resources and Website very well designed and thoughtful re implementation
- Lots of options
- Vocab
- Interactive (Wheel)
- Research articles
- Presentation material *thank you!
- A very comprehensive yet easy to navigate
- Love the layout and exemplars
- The resource "The effective mathematics classroom"
- Quick Assessment rubrics
- Videos are great
- Parent letters (understand numeracy)
- Can submit stuff too
- Well done! Goes from the big picture to the details.
- It's a lot of information – well organized.
- Exemplars
- The Wheel is my favorite
- A very comprehensive yet easy to navigate resource.
- Love the layout and exemplars.
- Would simply share the URL and say "It's there. Plaay if you want."
- Share: Assessment Resource when working as a team for our PTP rollout…
- Presentation material *Thank you!
- Quick Assessment
- Resource for rich multi-level problems to be solved
- PDF AND word versions
- Researchers talking about it