

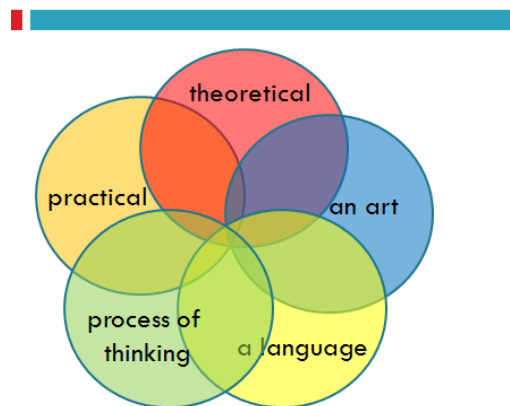


## FORT LA BOSSE NUMERACY PLAN

2016

**Our goal is that we can become better at diagnosing our students in Math class, and setting each on their own journey to becoming competent, risk-taking, independent learners with a strong skill set combined with number sense... with a confidence to believe that they are mathematicians!**

### Mathematics is ...



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The Fort La Bosse Numeracy Committee has been formed to better support our students in their academic success in numeracy skills from K-9. It is our belief that by better preparing our students at these levels, they will see greater success at the senior years level and beyond. The following document attempts to outline a plan in which educators across our division will be working towards this common goal, with common strategies in place. These steps also clearly align with the Manitoba Provincial Report Card which has the expectation that students will be assessed in Knowledge, Mental Math and Problem Solving.

This plan contains five distinct areas:

- I. Basic fact improvement and tracking
- II. Oral time will be infused into every math classroom to support mental math strategies as well as spiraling curricula (constant cumulative review)
- III. Problem solving will become common place in all math classrooms
- IV. Common assessment tools to both assess students diagnostically (pre) and summative assessments to track student achievement as well as accountability for all.
- V. Supports—Numeracy Coach, Curriculum Coordinator, Divisional professional development, peers, Divisional pilot in Electronic Resource Dreambox Learning etc.

This document will include current resources available within our division to support this process as well as those from Manitoba Education and other jurisdictions.

$2 > -3$   
 $0.999... = 1$   
 $\pi \approx 3.14$   
 $\sqrt{2}$   
 $5^2$   
 $(1 - 2) + 3$   
 $5(2 + 2)$   
 $101_2 = 5_{10}$

## **I. Basic Facts Improvement and Tracking:**

**In Fort La Bosse we believe that students should develop automaticity in recall of basic facts, but this skill set is best developed by teaching our students specific strategies in order to learn and retain them. Our goal is that our students have recall ( in approximately 3 seconds) of basic facts in addition/subtraction to 18 and multiplication/division to 9X9 by the end of grade five. We will be tracking individual students in their growth on this journey until the end of grade 8 to ensure all students have met these requirements.**

**Manitoba Education curriculum documents outline the progression and requirements across all grade levels. We do believe however that this progression of learning takes on a distinct order from least sophisticated to most, and this order should be followed in teaching.**

**Attached are four documents from Manitoba Rural Learning Consortium included; Counting and Place Value Grade 1-8, Addition and Subtraction Grade 1-8, Multiplication and Division Grade 1-8 and Rational Number Grade 1-8. These documents highlight the Knowledge Domain (Manitoba Provincial Report Card) and include the required basic fact acquisition in Manitoba by grade level, suggested strategies to introduce the topics, common misconceptions, glossary etc.**

**These documents reflect both Manitoba outcomes as well as current best practice in student learning.**

**Further, in our continued attempt to track data in Fort La Bosse, we believe it is necessary for educators, parents and most importantly students to be fully aware of which of these facts they are successful with as well as where they still need supports. Thus, teachers will be required to track these basic facts by grade level and report on each student individually. Individual student data will**

**highlight areas of need, ie: what facts the student DOES NOT KNOW. This data will be recorded and move with the student from grade to grade. The expectation is that teachers will access that data and plan their instruction based on previous need, despite grade level expectation in some cases. (see below). Further, teachers will be required to submit a list of their class at year's end indicating whether students are meeting, approaching or does not meet at this time. Teachers' professional judgment will be used to determine between levels. Attached is the link for grade level spreadsheets to track and record this information.**

**<http://curriculuminstructionassessment.wikispaces.com/Numeracy+Plan>**

**Grade 1:**

Recall of one more and one less, complementary (compatible) numbers that add up to 5 and 10, doubles (up to  $5 + 5$ ), and related subtraction facts is expected by the end of Grade 1.

**Grade 2:**

Recall of facts to 10, doubles to  $9 + 9$ , and related subtraction facts is expected by the end of Grade 2.

**Grade 3:**

Recall of addition and related subtraction facts to 18 is expected by the end of Grade 3..

**Grade 4:**

Recall of the multiplication and related division facts up to  $5 \times 5$  is expected by the end of Grade 4

**Grade 5:**

Recall of multiplication facts to 81 and related division facts is expected by the end of Grade 5.

**As noted above, this fact acquisitions end at Grade 5 however, the expectation will be that teachers will continue to work with students on previous grade level expectations until that time they are completing with automaticity and/or an adaption plan is in place.**

**MANDATE: By June 15<sup>th</sup> of 2017, all teachers will be required to document individual students recall of facts NOT learned. This individual data will move with the student to the subsequent grade.**

As well, all teachers in classrooms from Grade 1-8 in which there are students not meeting these requirements to forward the spreadsheet to their in-school administrator indicating on their class list which students are MEETING, NOT MEETING and APPROACHING. Divisionally this data will be collated and shared back with schools.

**Not Meeting**—approximately less than 50% of required facts within 3 seconds

**Approaching**—approximately 51% to 80+% of required facts within 3 seconds

**Meeting**—approximately 81+% of or required facts within 3 seconds.

Certainly it is not an expectation that teachers will be counting the number of facts to determine if a student is Not Meeting/Approaching/Meeting but rather will be utilizing their professional judgment in doing so. The grade level that a student is in also will help determine as students in Grade 1 do not have nearly as many facts to be able to recall in 3 seconds as a student in Grade 6 in which all addition/subtraction/multiplication and division facts are the expectation.

## **II.) Oral Time Infused Into Every Math Class:**

In Fort La Bosse we believe that cumulative spiraling of the curriculum is necessary for those difficult concepts to be learned with confidence. In some cases the concepts are difficult and require additional teaching and in other cases in order for students to ensure this learning has gone beyond their short term memory into their long term memory, additional practice is required. We believe this oral time can be best served by continually pulling from those areas in which our students have a need. The number strand in particular will be one that teachers will need to continually loop back to. Ie: not just teaching by unit or chapter but rather constantly holding students accountable to the “essential learning outcomes”. As indicated in the Manitoba Education document, *Glance Across the Grades* (attached) and the Manitoba Education Documents *Curriculum Essentials* (attached) as well as referring to the Manitoba Rural Learning Consortium documents (attached), these big ideas begin very early and continue across all grade levels. By constantly working with our students through intelligent practice, conceptual understanding is developed alongside the development of procedural fluency. (NCETM, October 2015)

Thus, it is the expectation and mandate that by September of 2016 that K-9 teachers will infuse a minimum of 10 minutes of oral instruction in Math per day drawing upon those big ideas paying particular attention to the Number Strand. Depending upon the teacher style and grade level, this can occur in any number of ways. Teachers could access technology to support this process such as Clickers or Survey results, or less sophisticated styles such as number paddles and clothes lines in math classrooms. (refer to samples in this document). This style of oral reciprocation (not just teacher talking but student replies) does not only reflect best practice in math instruction but is a valuable Assessment FOR Learning tool to better gauge student learning in general in the classroom. Primarily however, our intent is student learning in particular in a cumulative, spiraling fashion of the curriculum. Supports will be in place to help teachers in

this process through professional development across the division as well as the Numeracy Coach, Curriculum Coordinator and peers.

### **III.) Problem Solving:**

Current research would suggest that although students may be able to perform certain mathematical functions in isolation, they struggle when faced with authentic, real life problem solving situations. Rarely in life do our problems come in a neat column and thus infusing problem solving into our math classrooms is necessary to instill this confidence of risk taking. Students should be encouraged to solve both simple one step problems as well as multi step problems. Students should be exposed to all levels of problems; Level 1,2 and 3. Group work is an excellent environment to introduce problem solving as students are more confident to participate in this scenario. Finding the correct answer may not always be the most important aspect however, but rather pushing our students to find the strategies, stamina and confidence to continue to persevere.

Below is a synopsis of what classrooms could resemble:

I.) Cooperative Learning is infused in all math classrooms. “Cooperative learning is a teaching approach in which students collaborate in groups to complete specific activities. Unlike group work where there is no collaborative structure, cooperative learning focuses on developing key collaborative skills and ensuring that all group members participate in each task.” (Downey, 2000; Sousa, 2001).

Some Key Benefits of Cooperative Learning are: students can learn mathematical strategies from each other, students can discuss and write about their mathematical thinking and receive feedback from their peers, students can develop effective verbal, writing and reading skills, students can consolidate their understanding of specific mathematical vocabulary and concepts, students can share different ways to model a problem, and the cooperative process can assist in



developing collaborative learning skills that are critical to an effective mathematics classroom. (Krpan, 2013).

Thus, it is an expectation and mandate that by the 2016-17 school year, all teachers in K-9 will incorporate a minimum of ten (monthly) rich, extended exploration problems in their math classroom. Certainly additional problems can be infused some of which are more traditional/ routine in nature. Problems can be accessed from a number of sources both through publications (Hands on Problem Solving) and electronic sites such as:

In-school Administrators will observe a minimum of one problem per classroom/teacher per year.

<http://www.insidemathematics.org/problems-of-the-month/download-problems-of-the-month>

<http://mathcentral.uregina.ca/RR/main>

<http://www.nzmaths.co.nz/problem-solving>

<http://www.otffeo.on.ca/en/resources/lesson-plans/using-open-ended-questions-primary-math/>

<http://firstgradebloomabilities.blogspot.ca/2015/01/the-value-of-open-ended-math-questions.html>

<http://curriculuminstructionassessment.wikispaces.com/Numeracy+Plan> On this wiki is a document of problems/sites that was created by the FLB Numeracy Committee.

Some examples of cooperative learning structures that could be beneficial to the organization of a classroom are:

### Cooperative Learning Structures:

Cooperative Learning Structures provide the necessary organization and guidance for students as they work collaboratively in groups. The following are

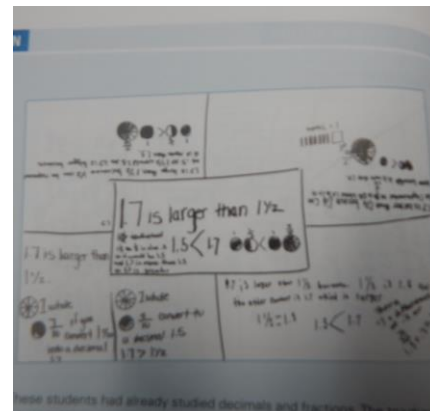
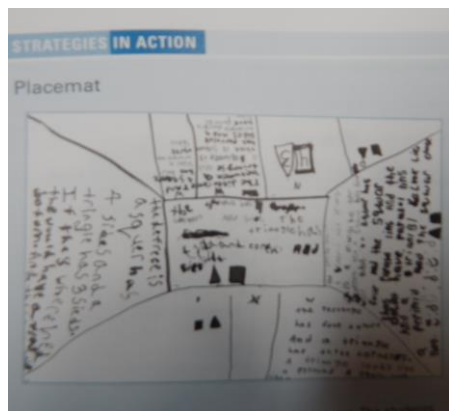
not an inclusive list, but do give some helpful structures that could be easily infused into a mathematics classroom.

**THINK-PAIR-SHARE:** This structure begins by inviting each student to think about a specific mathematics topic or question and then discuss with their partner. Once they have done so with their partner, they then can expand to the larger group. This is a very simple, quick method of ensuring engagement by all students. Everyone is accountable and helps eliminate those students “hiding” within the community of learners.

*EG: Question: 3,8,16---What is the odd-man out? (ie: what number doesn't fit?) Have the students turn to their partner to discuss-face to face. Finally they will share with the larger group their choice and be prepared to defend it. For instance, some students may choose 3 because it is odd. Some may choose 16 because it is a two digit number, or choose 16 because it is a perfect square?*

**PLACEMAT:**

This is a cooperative learning structure that helps students work together and share ideas in a group while allowing each member of the group to reflect on the task prior to sharing with others. Each member of the group is expected to fill in a section of the placemat and sign their name so that accountability is built in. They may choose to write, draw, or even use manipulatives to represent their ideas. The middle square may perhaps be utilized for those most common ideas. This structure can be used for solving problems together. (images below Krypan, 2013)



### **THREE STAY, ONE STRAY:**

Students will form groups of four which will be their home groups. The teacher provides the students with an activity, such as a writing response, word problem, modeling ideas with manipulatives, brainstorming etc.. Once the group has reached some consensus, a teacher appointed spokesman to share the work completed. This student will visit another group and do so. This process continues with spokesmen moving around groups until they return to their home group and share the ideas of other groups.

### **GALLERY WALK:**

As used in other subject areas, students post their group work in the classroom and students circulate to look at others' work. Students are encouraged to provide feedback with sticky notes.

Some sample descriptive feedback prompts could be:

- \*Can you think of another way to explain...?
- \*What you wrote is not clear to me because....
- \*Try to add more detail to...because...
- \*I do not understand...
- \*I like the way you....because...
- \*You need to explain because....
- \*You forgot to add....
- \*The diagram you created of...is helpful because...
- \*I did not think of using this strategy. It is very effective because...

**\*The strategy you used does not make sense to me because....**

**\*Your presentation is clear and easy to follow because...**

**INSIDE-OUTSIDE CIRCLE:**

**This activity encourages children to work together who may not by their own choice. It also gets students moving which also is beneficial. It really gets students talking all at once...all students are held accountable. Some ideas to utilize this activity could be questions that involve reviewing the previous' days lesson, reflect on a math problem and discuss how they would solve it, discuss a challenge or success of today's lesson, explain different vocabulary words, review concepts prior to a test etc.! Students are organized in two concentric circles with the same number of students. Inside circle faces the outside circle and once they have the topic they discuss. The teacher could give 30 seconds or a minute prior to having students on the inside circle to move clockwise one partner. (Chart: levels of discourse in mathematics classroom from National Council of Teachers of Mathematics.)( Note: larger visual below can be viewed at <http://curriculuminstructionassessment.wikispaces.com/Numeracy+Plan> Krypan, 2013.)**

Instead of saying	Say...
What answer did you get for...?	<ul style="list-style-type: none"><li>• Explain how you arrived at your answer.</li><li>• Tell me what you were thinking when you arrived at this answer.</li></ul>
Do you understand what Andrew said?	<ul style="list-style-type: none"><li>• Please explain what Andrew just said in your own words.</li></ul>
Who arrived at the same answer as Sonal?	<ul style="list-style-type: none"><li>• Please share with Sonal the strategies that you used.</li><li>• How are they the same or different?</li></ul>
Any other questions?	<ul style="list-style-type: none"><li>• Turn to your partner and share what you have learned today. List any questions you would like to ask before we begin the activity.</li><li>• Can someone explain what I just said in their own words?</li></ul>
This answer is correct. That answer is not correct.	<ul style="list-style-type: none"><li>• Is this answer correct? Why? Why not?</li><li>• Does this answer make sense?</li><li>• Do you agree with Matthew? Explain to him why you do or do not.</li><li>• Prove that your answer is correct.</li><li>• Explain to Group 4 why you do not agree with their answer.</li></ul>
These are the same strategies	<ul style="list-style-type: none"><li>• How are these strategies similar or different?</li><li>• What do you notice about these strategies?</li></ul>
This is the best way to solve these kinds of questions.	<ul style="list-style-type: none"><li>• Let's compare the different strategies that were shared. Which do you feel is the most efficient? Why?</li></ul>
What is the formula for?	<ul style="list-style-type: none"><li>• Turn to your partner and explain how this formula works.</li></ul>
What formula did you use?	<ul style="list-style-type: none"><li>• Explain to us why you chose the formula you did for this problem.</li></ul>
The term...means...	<ul style="list-style-type: none"><li>• What does...mean?</li><li>• Can you give me an example of...? What is it?</li></ul>

**EFFECTIVE QUESTIONING:** Effective questioning is essential for encouraging deep, insightful mathematical discourse in the classroom.

## **II.) Mathematical Discourse:**

Teachers become facilitators and questioners, guiding discussions and helping students make meaning of the mathematics rather than just providing answers and listing the steps to follow. This provides the students with the opportunities to rehearse their thinking and link ideas together. Further we also enable them to develop key critical thinking skills. Stopping to reflect on their thinking will provoke increased understanding. They learn to communicate and communicate to learn. Thus, student achievement and engagement are improved when they have the opportunity to explain, compare and justify their thinking. Strategies that should be evident to provoke and facilitate talking are referred to as Talk Moves: Revoicing, Repeating, Adding On, Wait Time, and Reasoning. (see attached for Samples of Effective Questioning) (Krypan, 2013)

Some examples of teaching Strategies that could provoke discourse are:

**\*Pattern Block Talk**-Organize students in pairs so that each student cannot see what the other is doing. (ie: back to back). Give students ample pattern blocks, and give one student a pattern/design to recreate by describing using appropriate vocabulary. Invite students to note similarities and differences once they have completed and seen the partners work. Students could even brainstorm prior to starting what the appropriate vocabulary would be. Suitable for all ages.

**\*Clipboard Walk and Talk**-this activity encourages students to engage in ideas about a math question or problem and does so using thinking, writing and pictures. Pose a question to the class, (such as

“How much water would a puddle hold?”, or How many jelly beans do you think that jar holds?”) Have students stand, and play some music. Students walk around until the music stops. They then pair with a student nearby and share their ideas regarding the problem. Encourage them to pose questions to each other as well. Repeat the process once the music starts again. Once sharing has happened with several partners, bring the group back together and discuss solutions.

**\*It is and it isn't-**Students will discuss a mathematical concept by describing what it is, and what it isn't. It provokes critical thinking and students need to support their ideas with mathematical information. This works great in pairs with one saying what it is, and the other what it isn't. Pairs can share their ideas together with the larger group when done. Eg: Number—22. Student one-it is an even number because it can be divided by 2. Student two-It is not a prime number because it has more than 1 and itself as factors. Student one-it is a palindrome because it reads the same forwards as backwards; student two-It is not a decimal because there is no fraction or decimal part etc.

**\*Concept Attainment-**In this activity students determine the underlying concept that defines a concept or category. They do so by comparing attributes of items that are part of a group to those of items that are not included. This activity provokes critical thinking skills and also infuses students verbally sharing their thinking. Eg: Choose a concept that is suitable for your age of students such as even numbers, or mixed numbers etc. Create a set of example cards that represent the concept (yes cards) and a set of example cards that do not represent the concept (no cards). At least 5 to 10 of each. Create a T-chart with yes and no, but do not announce the concept, but rather have the students choose if their example would fit in the yes or no column. Ask the group to decide what underlying characteristic of items in the yes column indicate. Once you feel some students have

figured out the concept, rather than reveal it, have them come up with their own examples of yes/no.

**\*Mathematical Clothesline**-in this activity students organize a group of concept cards in a particular order or grouping on a clothesline. As they hang the cards, they need to consider their own and the cards that others have placed on the line. This can be used for all grade levels, and the teacher can certainly differentiate as they distribute the cards to particular students. Images could also be used on the cards, and depending on the age level, the cards could be “mixed up”. I.e, mixed numbers, whole numbers, decimals, integers etc. (image below Krypan, 2013)



**\*Wanted Number**-In this problem-solving activity, students process information to identify a number that meets a set of criteria. More criteria is provided as the activity progresses. Number tiles will work or even have students write the digits 1-9 on small sticky notes so that they can move them around. This is an excellent activity for helping kids consolidate their mathematical vocabulary, practice active listening, and develop an understanding of the different attributes a number can have. Eg: Create a set of clues about the mystery number from very general to specific... it is a whole number, it is an even number, it is less than 500, one digit is prime etc. If the mystery number has repeating digits, ensure the kids have additional number

tiles/sticky notes. As you read through the clues, give the students time to move around their digits. This activity can be used for all age levels and abilities. You could also have students create their own Wanted Posters.

**\*Math Congress**-This instructional strategy is one that many of our teachers and schools in FLB are familiar with because of the work of Kathy Fosnot. Students work on a rich mathematical problem in pairs or groups of three, and then share their solutions with the whole group. It is critical that the students have a rich task to start with which invite multiple solution strategies to solve. This challenges our students in deeper, below the surface thought processes. It can certainly involve a variety of ability levels and learning styles. Problems should be of the type with a “low floor/high ceiling” and multiple entry points.

Egs:

How many different ways can you divide a square?

There are 34 students in the class. There are 4 more boys than girls. What is the number of boys and the number of girls in the classroom?

I was out with my family and we ordered pizza. After we finished our meal,  $\frac{1}{3}$  of the pizza was left. Two family members wanted to eat it. How much of the whole pizza would each person get if they shared what was left equally?

How many different ways can you show the fraction  $\frac{1}{2}$  on the geoboard?

This process will be an ongoing one, with supports in place. The expectation is that all teachers will attempt to infuse problem solving into their classroom. In-school administrators will be working with



staff to grow in this area. Resources will be available to assist schools in this transition.

**\*Counting:** The value of counting in all grade levels cannot be dismissed, and is an excellent opportunity to have students express orally while at the same time allowing the teacher to formatively assess the classroom as the students count one after the other. For instance, depending on the grade level, students could be counting by 2's, or 5's starting at a standard number (2,4,6 or 5,10, 15) or nonstandard manner such as counting by 2's starting at 11 for instance. Older students could count by tenths,  $\frac{1}{4}$ 's , backwards etc. Teachers are encouraged to have students count beyond 100 as well, as we tend to stop at this benchmark traditionally.

#### **IV.) Common Assessments in Fort La Bosse:**

In Manitoba, there are common provincial assessments in place, some of which are standards tests and others which are based on classroom based instruction.

##### **Provincial Assessments:**

**Provincial Grade 3: Classroom Based Assessment: (end of October)(formative)**

##### **Algebraic Reasoning:**

- predicting elements in a repeating pattern
- understanding what equality represents

##### **Number Sense:**

- representing whole numbers to 100 in a variety of ways

-using mental mathematics strategies to determine answers to addition and subtraction questions to 18

**Provincial Grade 7 Classroom Based Assessment: (end of January)(formative)**

Student has a conceptual understanding of number and some of it's representations:

- student orders fractions
- student orders decimals
- student understands that a given number may be represented in a number of ways

Student solves mathematical problems using knowledge of number patterns and mental math strategies:

- student uses number patterns to solve mathematical problems
- student uses a variety of strategies to calculate and explain a mathematical problem

**Grade 12 Provincial Standards Tests in all strands (Essentials, Applied and Pre-Calculus Math) end of term (summative):**

-based on entire curriculum.

**Divisional Assessments:**

**Divisional Mental Math Assessments—**

**By June of 2017, all students in grades 2, 4, 6 and 8 will be assessed via a consistent oral Divisional Mental Math tool.**

**Section 1: Oral Counting (classroom based)**

**Section 2: Calculations with oral explanation (classroom based)**

**Section 3: Three step problem with oral explanation (divisionally provided-teacher assessed)**

**Even grade levels will be based upon addition/multiplication operations. Odd grade levels will be based upon subtraction/division operations.**

**Results accumulated from this will be tracked simply by MET and NOT MET. This assessment will not be included in a student's overall mark, however we will track by student from grade to grade as well as the**

spreadsheet will be forwarded divisionally in order for us to track this data divisionally.

By June of 2018, we will further include all grade levels including above, as well as 1,3,5,7 and 9.

**Divisional Grade 9 Math Exam: (end of year): (summative-developed in-house with teacher input)**

-based on entire curriculum with more emphasis on those primary outcomes that the students will require in subsequent grade levels.

**Divisional Formative Assessment Quizzes:**

Based on the Prince Edward Island model, in Fort La Bosse we will initiate formative assessment quizzes to be completed throughout the year based on the essential learning outcomes in that particular grade level. We will begin this pilot with one grade level, grade 9, with plans of working down through the grade levels as appropriate. The formative assessment quiz scores will not be included in the students' final grade, but rather will drive instruction as the year progresses. The results from each quiz will be transparent and shared with the students so that they can see areas of weaknesses and also areas of strengths. We believe that the miscue analysis carried out for each of these quizzes will be highly beneficial as a tool of growth for all involved in the learning team, most importantly perhaps by engaging the student themselves. Assessment FOR Learning is perhaps the most advantageous tool to better support student learning for both our high and low achieving students, and we believe this initiative will yield exciting results. Further, Fort La Bosse is joining 17 rural school divisions to participate in an Action Research Project with the Manitoba Rural Learning Consortium. Select teachers at grade 6 and 9 will be participating in this project following the protocol developed via the PEI model. Pacing guides will be followed as well as formative quizzes, and a summative assessment in June, Further There will be professional development provided to support teachers as part of this process.

**Diagnostic Tasks Available in Fort La Bosse: (not mandated)**

Although not mandatory, it is highly recommended that teachers in Fort La Bosse take advantage of a variety of Diagnostic tasks that are available in Fort La Bosse to pre-assess where their students are at. A caveat however when utilizing

diagnostics, to protect the integrity of the diagnostic to use again, teachers should not go over these with students after completion but rather build their future teaching around how students performed.

The following are available:

**Fort La Bosse Early Years Diagnostic Tools (Level A-5,6 and 7 year olds) and (Level B-7,8 and 9 year olds)**

**First Steps in Math**

**Numeracy Nets K-8**

**Leaps and Bounds (3/4, 5/6 and 7/8)** These are included within an intensive Intervention program designed for students up to 3 grade levels delayed.

#### **V.) Resources:**

As a division, we have a significant amount of resources available to support our educators, both in human resources as well as technology, books, web sites etc.

In particular, the FLB Numeracy Coach is in place at 0.5 FTE to better support the teachers in Fort La Bosse reach these goals both individually and in group situations. Further, this individual works closely with the Curriculum Coordinator to provide time, resources and supports when needed. As well, a number of master teachers in our division have grown to be excellent mentors to support one another across many of our schools. Manitoba Education, Board, Senior Administration and In-school Administrators all recognize how vital Numeracy is in the growth of our students of FLB, and thus this plan and initiative has evolved.

Dreambox Learning is the first Manitoba Education approved electronic tool that is currently part of a Divisional pilot in which all K-8 schools are participating for the 2015-16 school year to also better support this learning trajectory.

**ATTACHMENTS:**

- **Mental Math End of Year Targets-Manitoba Mathematics Consultants**  
<http://curriculuminstructionassessment.wikispaces.com/Numeracy+Plan>
- **Mental Math and Estimation Rubric-Manitoba Mathematics Consultants**  
<http://curriculuminstructionassessment.wikispaces.com/Numeracy+Plan>
- **Glance Across the Grades-Manitoba Education-**  
<http://www.edu.gov.mb.ca/k12/cur/math/index.html>
- **Mathematics at a glance (by grade level)-Manitoba Education**  
<http://www.edu.gov.mb.ca/k12/cur/math/index.html>
- **MRLC-Knowledge Domain-Counting and Place Value**  
<http://www.mrlc.ca/>
- **MRLC-Knowledge Domain-Addition and Subtraction**  
<http://www.mrlc.ca/>
- **MRLC-Knowledge Domain-Multiplication**  
<http://www.mrlc.ca/>
- **MRLC-Knowledge Domain-Rational Number**  
<http://www.mrlc.ca/>
- **Problem Solving Rubric-Manitoba Mathematics Consultants**  
<http://curriculuminstructionassessment.wikispaces.com/Numeracy+Plan>
- **Indicators of Success-Math Expressions: Developing Student Thinking and Problem Solving Through Communication (2013)**

