

PDIG REPORT
Ayer's Cliff Elementary School
May 2019

Day One:

In 2016-2017, our school team used the PDIG grant to develop a math passport for each cycle. These passports were completed the following year. This year, given the change in the teaching staff, we needed to start this project with a review of each passport. The team leader and another teacher took some time prior to this day to verify the documents from the previous year and prepare the necessary materials in order to be ready to reintroduce the teaching staff to the passports.

For some, it was a way to get reacquainted with the tool in order to explain it to others. For half of the team, this was new material. Our kindergarten teacher was interested in choosing a few objectives to be responsible for with her age group.

We were able to demonstrate how we had dissected the Progression of Learning and chosen the objectives that were essential to our students' success. This process allowed us to have the necessary foundation to move forward with the rest of our objectives for this PDIG. The question of deployment still needs to be revisited but for now, we think that we would like to present it to our parents during our Open House at the beginning of next year. This tool will clearly indicate the students' progress with green stars and yellow stars. The students will be introduced to it in their classroom in September.

Day Two:

In the morning, our consultant, Jennifer Hall, presented us a series called Making Sense of Mathematics. The thinking behind the research reveals how the children benefit from using manipulatives and from being asked to represent concepts in different ways: drawings, acting, using objects, writing equations, etc. It is clear that children need to have access to manipulatives at all times throughout elementary school and beyond. They need to be shown how to use them so that they will automatically think of using them when solving problems.

It seems that teachers feel pressure from the parents to complete exercise books (80% of the book) but teachers realized that they were asking the children to complete written tasks in these books before the children had truly acquired the concepts. Children also find comfort and

familiarity in the book work and are visibly uncomfortable when asked to prove their answer using manipulatives, lacking the skills and vocabulary to do so.

The afternoon was very much enjoyed by teachers who were now ready to dive into the practical applications. They understood the difference between teaching so that the students would learn and master new concepts versus simply teaching a skill. The primary focus was on Number Sense, Operations and Arithmetics in cycle 1 and on Fractions in cycle 2 and 3. In reviewing our end of cycle assessments for 2011 to 2016, we knew that these were the areas of concerns for our school.

Teachers were keen to implement the tools and teaching strategies and everyone used them with their students shortly after. Teachers were very appreciative of the already made tools that were given to them by our consultant. Many conversations in hallways and staffroom ensued. Math teachers were fascinated by the degree of involvement from the students in the tasks but also by their ability to identify areas of concerns within minutes. Using manipulatives and asking the right questions also facilitates scaffolding and differentiation. With practice, teachers will develop their ability to ask the right questions but also to modify a task quickly for the struggling students or for the gifted ones.

In cycle 2 and 3, it was also observed that some students who excel in doing written exercises in the workbook, showed a lack of understanding when asked to represent their solution in different ways. Surprisingly, students who struggle with the math book sometimes showed an incredible sense of logic when using manipulatives. This proves that being able to use different tools when working out problems is the only way to truly show mastery of concepts and that differentiation must be addressed in every classroom.

Day Three:

The original plan for this day was for our consultant to present Math Talk. However, early in the planning, it was clear that we needed to spend more time learning about teaching strategies using manipulatives. Although Jennifer Hall gave examples of good math questions, we did not have time to do a complete day on this subject. Some examples of good questions are: Are you sure of this answer? Can you show me this in a different way? What would happen if...

Our consultant brought many manipulatives and task cards and we took on the role of students. We learned how to use everyday materials as tools for learning but also how to use the materials that we already have at school. Naturally, we will have to consider purchasing more if every classroom needs to have them on hand at all times.

Taking on the role of the students allowed us to see where the difficulties could come from and how we could prevent and address these problems. Fractions remain a high priority for cycle 2 and 3. It is evident that the students come into cycle 3 without the necessary understanding of fractions so learning this complex concept remains a priority.

Cycle 1 teachers realized how important it is for math to be fun, hands on and interactive. Being able to express ideas between students automatically requires deeper thinking so we must encourage teamwork and talking about math. Cycle 1 teachers worked with number lines and number paths, the latter a new tool for some of us. They also created some.

In cycle 2 and 3, we also have to remember that the children still need to play and interact during class. Well directed questions and task cards continue to be at the center of their learning and talk must be encouraged. We find that this way of teaching raises the engagement of children and solidifies their leanings.

Jennifer Hall presented Math Centers as a viable options when using manipulatives. This way of teaching allows the teacher to work with a few students at the time and to encourage talk. Children like to be able to move from center to center and, and if well planned, these centers allows the children to work on strategy games, representing numbers and operations in different ways, talk to learn and do math worksheets as well as have small group instructions with the teacher. It also addresses the need to scaffold and differentiate.

We talked about our Passports. Although the tool is still important as a selection of objectives from the Progression of Learning, as a communication tool with parents and as a planning and accountability tool for teachers, it is clear that we need to make a selection of a fewer objectives to use when implementing RTI into our schedule. This follows the UDL model of teaching which our Board is slowly moving towards for the years to come. We will guarantee that 95% of our students will reach the selected 5 to 10 objectives per year. We will need to make that selection as a staff and submit it to Jennifer Hall for approval and have it ready for the following school year.

We decided that moving forward, for the rest of this year, the focus would be on mastery of concepts and not on finishing the math book. It is better to go slow than to rush and have the children not be able to carry their knowledge into the next year.

Cycle 3 is considering not using workbooks at all next year and the consultant has agreed to support that endeavour. The rest of the day was spent looking at the cycle 3 passport and in selecting a few objectives to commit to the RTI approach. Our consultant left with our notes and will evaluate our choices.

Day Four:

On this day, our 6 team members and our principal, Tracey Harding, were present during an offsite meeting. We took a few minutes to fill out a brief questionnaire to guide our discussion time. Here is our final conclusion.

Teachers were very pleased with the project and feel that it met our objectives. Our parents should be pleased that we have taken their concerns seriously and that we are addressing some issues regarding our end of cycle results. This way of teaching should definitely allow us to meet our objectives as written in our Educational Project.

MESA 2016-2019:

At ACES our Math goal for the past 3 years has been to increase the MEES/ETSB end of cycle June exam results for Cycle 1, 2 and 3 to 70% of the students receiving a passing mark of 60% or better in the Arithmetic/Operations concept in Application problems.

Here is a breakdown:

Year 1:

1. Vertical alignment
2. Math Students Passport

Year 2-3:

3. Increase manipulative use
4. Math Centres and games
5. Math discussion in class

Book: Classroom Discussion in Math (by Suzanne H. Chapin, Catherine O'Connor, Nancy Canavan Anderson)

After completion of the PDIG we will continue to use what we have learned and worked on and apply it to everyday math lessons. We will have monthly mathematical board games afternoons with the students and will also have a monthly math cycle team alignment meetings with our Board consultant to ensure that all targets are being reached by all cycle levels.

They appreciated receiving materials, ready to use, but also building their own. They found the ideas and tools totally relevant to their age group and will enjoy using them on a regular basis. They also appreciated receiving task cards and building their own but would love more time to create some and to be able to purchase some as well. Mrs. Hall suggested purchasing or borrowing a few books: Mine the Gap for Mathematical Understanding, Mindset Mathematics and Making Sense of Mathematics for Teaching. Teachers wished that more time

would have been available for planning and for looking deeper at Passports for selecting fewer objectives.

Teachers realized that using manipulatives and task cards is a very engaging way for the children to learn. Although some children need redirecting when using these tools, we feel that the positives still outweigh the negatives. We feel that we absolutely need to develop evaluating tools because most of the observations must be written down quickly in order to keep track of children's needs and progresses. Team teaching would be a wonderful way to address this issue but we may have to settle for teaching and keeping a check-list at the same time. Using exit cards is also very practical.

As mentioned earlier, children's need for scaffolding and differentiation are met when working in centers, when they can talk and when they can show what they know in a variety of ways. This is not possible when strictly using a pen and paper.

We feel that we need to find a way for storing our materials in the classroom and also in a resource room. Our school building is small and that is a challenge for us. We love the idea of using manipulatives but we want to be able to share with one another without having to spend hours looking for the material when we need it. It is not realistic for each classroom to have its own material because of cost and space.

We took the time to select about 5 objectives per year to be our baseline objectives and they are included in this report. They will need to be reviewed by our consultant before we make a copy for each grade level. We want to be able to communicate clearly with any new teacher the following: The Passport (for each student) for our planning and for communicating each student's progress with the parents, the baseline objectives (around 5) for each year and the list of manipulatives available for teaching each concept. These 3 elements are included in this report.

In conclusion, teaching using manipulatives is how we are choosing to teach mathematics at ACES. We will meet by cycle at least once a month starting in September and will have the resource schedule designed to follow the RTI model for Math and LA. Our list of manipulative will need to be further developed to include more concepts and be age and cycle appropriate.

Our Grade 1 and 2 teachers have agreed to communicate our enthusiasm for this PDIG with another school team in North Hatley during a planning day in June. It is our wish to continue to build task cards, tools and a list of manipulatives in relation to math concepts. Sharing best practices with other teachers will maintain our focus and direction and will therefore, continue to raise our standards and results for the benefit of our students.

Attached, you will find the following documents:

1-Documents creative by and with our consultant, Jennifer Hall

2-Math Passports, included highlighted proposed objectives for RTI

3-List of manipulatives in relation to math concepts

4-An example of a word problem created by a cycle 2 student, following a hands on activity on operations.