

*Martine Pellerin, PhD, an Associate Professor at the University of Alberta's Campus Saint-Jean, and Stacy Pothier, a Grade 4 French immersion teacher in Springbank, prepared this article based on their workshop at the 2011 CPF Alberta conference.*

Back to school means back to doing homework with your child. The thought might trigger memories of frustration, nagging, tears and even power struggles!

Mathematics seems to be the area of the school curriculum that contributes most to making homework experiences stressful. When a child is enrolled in a second language program like French immersion, the language barrier may add another layer of frustration to the whole homework experience. This article is intended to provide French immersion parents with some guidance and strategies to help make math homework less stressful for both themselves and their children.

## **Brain research informs teaching/learning approaches**

Parents often bring their own experiences with learning into the homework scene. Most learned math from a "transmission of knowledge" model:

- The teacher presented the new concept on the blackboard
- Students worked independently and silently at their desks
- Discussion about math took place between the teacher and the student in a question/reaction scenario and seldom between students
- Talking with another student to get help was perceived as cheating
- Students learned by doing repetitive exercises—the idea was "practice makes perfect."

Teaching and learning approaches have changed based on research in neuroscience as well as psychology and other educational fields which has shed new light on how the brain functions and how students learn.

### **We know now that:**

- learning is a social endeavor
- interaction between learners is crucial to promote the construction of knowledge
- talk is a cognitive tool that helps students verbalize their thinking processes, negotiate their understanding and demonstrate their thought processes
- learning needs to be meaningful, authentic and linked to the students' life experiences.

### **Therefore, learning mathematics requires that students:**

- collaborate with other students in problem solving
- feel free to ask questions of the teacher and of their peers
- use talk to verbalize their thinking, negotiate their understanding, demonstrate their problem-solving strategies, and explain what they are learning
- solve problems that are meaningful to them and make connections to their own life experiences.

### **Students also need access to:**

- manipulatives, models, concrete materials that they can use freely
- computers, calculators, and new digital technologies like iPods and iPads as well as interactive bulletin boards that they can use to support their learning of mathematics.

### **Learning mathematics can also take place outside of the four walls of the classroom:**

- field trips showing mathematics in everyday life, such as a school yard, park, grocery store, construction site
- having people invited into the classroom and/or through social networking and digital media such as Skype.

### The new math curriculum

The new curriculum developed by Alberta Education reflects these new understandings about how students learn mathematics to become mathematically literate adults, using math successfully in their everyday lives and work.

The program has moved away from spending a great deal of time on learning numbers and how to compute (adding, subtracting, multiplying, and dividing) to focus equally on four strands: numbers, patterns and relationships, shape and space, statistics and probability.<sup>1</sup>

**How do students learn this new content?** The response is problem solving, which is the focus for learning mathematics at all levels.

The students learn mathematics by:

- using mathematical processes such as making connections with their prior knowledge, estimating, reasoning, visualizing, mental mathematics, talking (communication) and using technology
- creating learning bridges or connections between the two levels of thinking: the concrete and the abstract
- learning steps to solving problems that help them to organize their thinking
- creating their own sets of problem-solving strategies
- talking about mathematics to make sense of what they are learning and how they are learning it.<sup>2</sup>

**How can this information help you help your child?** The first step to helping your child with his math homework is to understand what he is learning in math class, how he is learning it and what kind of learning environment supports the new curriculum. Tension and confusion can arise when there is a discrepancy between the way a child is being taught in class and the way the parent thinks it should be done.

### How can parents help their children do their math homework in French?

Parents can help by extending mathematics learning from the classroom into life at home and everywhere around them. They can use meaningful and authentic life examples to help their children make connections between the concrete and the abstract.

Parents should not do homework for their children! Instead, they should engage in learning mathematics together with their child by applying skills learned at school to everyday situations at home.

You don't need to call on the use of a French dictionary or translator to engage your child in talking about mathematics. The role of the parents is to support the learning process, and the language in which this is done does not matter.

Parents can ask their children to demonstrate problem-solving strategies by drawing pictures or diagrams, through dramatization, using manipulatives, using technologies, etc. There are many ways for children to demonstrate their learning and understanding other than the traditional use of paper and pencil.<sup>3</sup>

Research indicates that students become more engaged in their learning when using digital technologies such as iPods and iPads, since it makes the learning more meaningful and authentic as well as allowing them to represent and demonstrate their knowledge and understanding in different ways.<sup>4</sup> Many educational applications are available for the iPad and iPod that allow voice recording while writing or drawing. The recording can be done in French or in English. The goal is not to practice the French language but to engage in mathematical talk and learn how to solve problems.

**What about the textbook?**

The approved textbooks for mathematics in Alberta are set up in a very specific format, leading the student through a variety of concepts. The approved texts for Mathematics in French are *Chenelière Mathématiques* for Grades K-3, 5 and 7, *Compas Mathématiques* for Grades 4 and 6, and *Chenelière/McGraw Hill* for Grades 8 and 9. There are a variety of approved texts for the senior high years.

*Chenelière Mathématiques* uses the following four elements combined to build ability in math: problem solving, understanding concepts, application of concepts, communication. Students need to read some background information first, followed by thinking and reflecting about the concept and process, verifying, and applying the concept to complete the questions.

*Compas Mathématiques* is slightly different. The textbook has chapters built around a clear process: a question as a starting point, reflection, verification, and application.

For both textbooks, each chapter will focus on a general objective from the curriculum, such as multiplication.

**What to do when your child says, “I don’t know what to do!”**

- Remember that your child is able to pick up on your frustration, so a calm, logical approach is the most helpful.
- Check for the goal of the lesson.
- Remember that math vocabulary is very Latin-based and so similar in both French and English.<sup>5</sup> It might not be the mathematics terms but the other words in the problem that can be confusing for your child. It is very important to use the illustrations to aid in understanding. Work together to look at the pictures.
- Ask some questions:
  - What is happening in the picture?
  - Are you working on .....?
  - What does the example show you?
  - Why did the book do it that way?
  - Have you learned a different way to do the question?
  - If we draw or act it out will it help?
  - Did you look for the key words?
  - Can you think of another way to do the problem?
- Establish a routine and persevere. Many students find math textbooks daunting on their own: often they may be working with a partner or group in class.
- Have your child establish a homework buddy or group. The old adage “two minds are better than one” can often solve math homework frustrations.
- Are you using social networks such as Facebook or Twitter? Have your child set up a page on Facebook for a homework group or use a hash tag for homework on Twitter.
- A homework blog or wiki maybe helpful. Many students are using these tools at school and know how to set them up.
- Skype! Your child can use this face-to-face technology to work with a homework buddy.
- Using applications for the iPad or iPod may be the key to inspiring your child to do homework. Try “Show Me,” an interactive whiteboard application for the iPad. This allows your child to write and draw out their answers and record a verbal explanation. This becomes a short video, which they can replay.
- If your child does truly not understand the concept, contact the teacher. Give specifics about what your child didn’t understand.

**Communicating with the teacher**

Your observations and knowledge about how your child learns are key in assisting her teacher to understand where she may be experiencing difficulty with math homework. When you communicate with the teacher, be prepared to be specific about what your child doesn't understand. This will help the teacher to tailor new learning experiences to her needs.

Ask yourself:

- Is it the math concept?
- Is it the vocabulary in the textbook?
- Is it reluctance to do homework after school?

Let the teacher know specifics like:

- Jacob couldn't read the problem.
- Jacob read the problem but .....
- Sarah couldn't get past .....
- Sarah is mixing up .....

**Remember...**

It is important to remember that each child learns in a unique way, and this applies to homework as well. The establishment of a routine that works for your child and you will be beneficial for your family, both in eliminating frustration and in creating success for your child. When you are a flexible problem solver, you are modelling behaviours that are important for your child's learning at school and at home.

---

<sup>1</sup> For more about the new math curriculum go to <http://education.alberta.ca/teachers/program/math.aspx>

<sup>2</sup> See *Working Together in Mathematics Education* at [www.education.alberta.ca/media/356481/mathprbk.pdf](http://www.education.alberta.ca/media/356481/mathprbk.pdf)

<sup>3</sup> See "What is Universal Design for Learning?" at <http://cast.org/udl/index.html>

<sup>4</sup> Pellerin, M. (2012 in press). Digital Documentation: Using digital technologies to promote language assessment for the 21st century. OLBI Working Papers. Vol.4.

Pellerin, M. (2012). Mobile technologies put language learning into young second language learners' hands. Proceedings of EuroCall 2012, Gothenburg, Sweden.

<sup>5</sup> See <http://education.alberta.ca/media/618959/fr-an.pdf> for a French-to-English glossary of mathematical terms, especially useful for high school students