



Flipping Math at KCS

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10/16/2012

"I like that if you don't get the answers you can go back and watch the video. I also like that you can stop the video if you want to take a note."

KCS Student in grade 7

"I think it's a fast and good way to learn. I'm grasping the concepts faster than I was in Saxon."

KCS Student in grade 7

"I like this program because I don't have to go over the same math stuff that I've known for approximately three years now and be bored in class. I also like this program because you can just skip to the advanced group when you want to."

KCS Student in grade 8

KCS is committed to doing its best. Initiatives are rooted in the needs of our students, and originate from faculty collaboration, professional learning, meetings with parents and our determination to meet students' needs.

One topic that is often the focus for discussion is math. In fact, math is a subject that offers unique challenges at every school. While KCS has always delivered a very strong math program, here is some of what KCS parents, and parents in general, have said they would love to have in their child's math program:

- A program that readily meets the different needs of all students
- A program that allows all students to complete their math homework with confidence and study more independently for quizzes, tests and exams, without help from parents or tutors
- A program that allows students who miss class to easily keep up-to-date
- Clear notes available for all
- A program that lets all students work at a level and pace that's optimal for them, including allowing students to receive instruction and work well beyond their grade level if appropriate



Andrea Fanjoy,
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- More time for individual and small-group instruction and review in class with their math teacher, and therefore less need for extra help outside of class time

KCS has been following how some innovative schools are using technology to help their teachers deliver such a program. As a result, we have launched a new tool and a new approach to teaching math in grades 7 and 8. This tool and approach have been shown to significantly help provide all of the above, with the additional bonus of having math instruction and review available 24/7, as frequently as students need, all year long. The approach is called **'the flipped classroom'** and the tool is an online program called **Math Help Services**. This program offers the strengths of our former program with all the benefits that technology offers.

A flipped classroom is said to be 'flipped' because an introduction to new concepts happens initially at home through short instructional videos, and more time is devoted in class for the application of learning that used to happen primarily as homework. With our new online resource from Math Help Services, KCS students have an account that gives them 24/7 access to an online collection of videos, lesson notes, sample questions and homework questions. Students watch assigned lessons on video at home as part of their homework. The video gives clear instruction and step-by-step examples. Students also take their first steps applying what they have learned from the video, doing practice questions and submitting their answers online. The program allows the teacher to monitor at a glance how well each student is doing with the questions. The teacher then uses this information to help determine who understands and who might need some extra attention during class the following day.

The benefits of this approach are numerous:

1. The videos allow all students ready-access to instruction and review anytime, anywhere, all year.
2. It has long been established that having some prior knowledge before instruction is optimal. Watching the videos at home allows for more effective and efficient teacher-led instruction at the start of class the next day.
3. With more effective and efficient instruction at the beginning of class, the teacher has more class time to meet with individual and small groups of students to differentiate instruction.
4. The homework assignments are designed to let students know right after completion whether their answers are right or wrong. Unlike traditional homework, this immediate feedback lets students either continue practising their correct understanding or take steps to correct their misunderstanding before bad habits become established. With the videos so accessible, students are becoming very resourceful in their efforts to understand their mistakes.
5. Students who aren't satisfied with their mark on an assignment can readily request and be assigned a remedial assignment with the aim of improving their mark. It is already evident that students are using the program to both fully learn and demonstrate their full learning of math concepts, which is the ultimate goal of any math program.

6. Math Help Services allows students to proceed at a pace that is more personalised for them. Students who need more guidance and practice on difficult concepts will more readily get that. Students who have an advanced understanding will be able to work on accelerated content, from either the subsequent grade or even as high as grade 12 math, if that is where a student's knowledge places him/her.
7. Math Help Services allows students to continue the frequent practice of all areas of math - numeracy, geometry, measurement, algebra and data management. Rather than only focusing on one topic at a time, regular application of all strands of math contributes significantly to mastery. Students also continue to use their grid notebooks to show their work. The videos and sample questions give clear step-by-step examples of how to properly solve questions.
8. Students are equipped to successfully complete math homework. All are fully capable of watching the videos, reading the clear lesson notes, and trying their best on the practice questions. If a student is struggling with a new concept, the teacher will know right away and can use class time to give individualized help. Parents no longer need to fill this role. On graded assignments and when preparing for tests and exams, if students have any difficulty, they can easily re-watch any video as needed and access a large number of practice questions in addition to getting extra help during class time.
9. Students who miss class will no longer face the same struggle to catch up. They will be able to access the videos, class notes and assignments just like their peers.
10. Due to the more effective and efficient way the flipped approach delivers instruction, there is more face-to-face time between the teacher and each student, and students are also able to work more independently and collaboratively. It puts math knowledge in the hands of every student, not just those of the teacher. Waiting for and being expected to go to extra help sessions becomes much less of a burden on students.

Improved class management, increased student engagement, greater mastery of math skills, and multiple ways to differentiate instruction are also among the many reasons why the flipped classroom model and new technical resources are drawing so much attention in schools around the world. We are pleased to launch this new approach and tool and, as with everything we do, will monitor it closely to make it the best it can be.

Parents who wish to learn more are invited to contact Andrea Fanjoy, Assistant Head, Academics at afanjoy@kcs.on.ca.