



Report: Math 911

Data shows poor math performance at CBE schools vs. CCSD schools. How can we better support students?

The current math landscape

In the wake of dramatic changes in the approach to math education in Alberta, data shows that lagging performance on math is widespread -- and getting worse -- amongst the current generation of students in Alberta. Test results show poor performance and post-secondary educators are commenting on incoming students' difficulty completing even basic math functions.

The effects of the adoption of inquiry-math are particularly striking in Calgary Board of Education (CBE) schools, where data shows a dramatic increase in children failing math from grade 6 to grade 12. Math scores have fallen rapidly at CBE and are now significantly lower than those of the Calgary Catholic School District (CCSD). In the last four years, there are more students failing math than achieving excellence in grade 6 – a dramatic reversal. In the northeast, CBE's underperformance relative to the CCSD is significant, representing a social justice issue that requires immediate solutions and resources.

Available data paints a startling picture of poor math performance and a concerning downward trend:¹

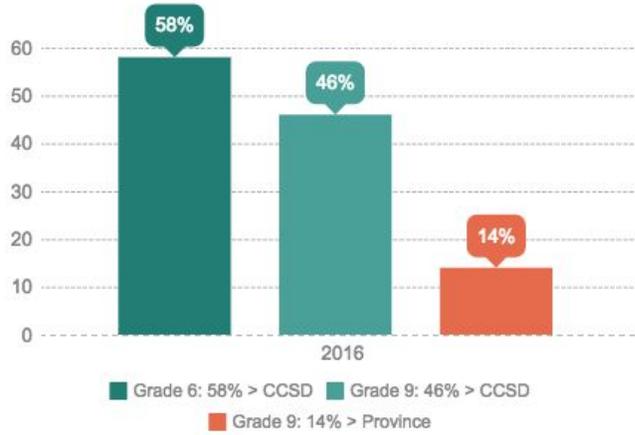
- CBE schools have a failure rate over 50% higher than the CCSD for grades 6 and 9.
- The CBE grade 9 failure rate is 14% higher than the provincial average.
- 93% of CBE schools in Calgary's northeast are below the Grade 6 math provincial average. This is double the rate for CCSD schools in the same geographic area.
- 100% of CBE schools in Calgary's northeast are below the provincial average in Grade 9 math.
- There has been a 20% decline in the number of children achieving excellence in grade 6 math.

¹ A note on the data: Data presented for math results are for students writing, which provides the most accurate snapshot of results. An in-depth explanation of why this is the most useful metric can be found on CBE Trustee Trina Hurdman's website:

<http://www.trinahurdman.ca/thoughts-on-comparing-pat-results-to-the-province/>



CBE Math PAT Failure Rate

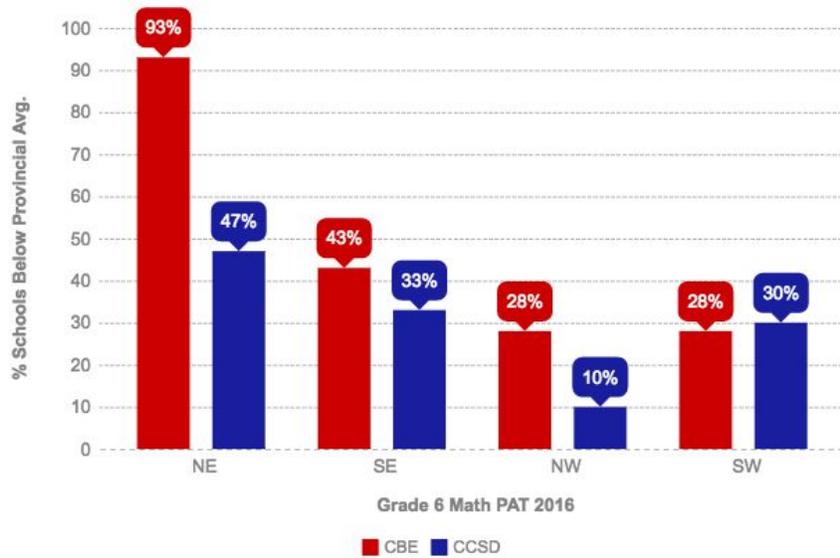


Note on the data: For the Grade 6 Math PAT, the CBE failure rate was 21%, thus 58% greater than the CCSD failure rate of 13%. For the Grade 9 Math PAT, the CBE failure rate was 28%, thus 46% greater than the CCSD failure rate of 19%.



Data source: Alberta Education

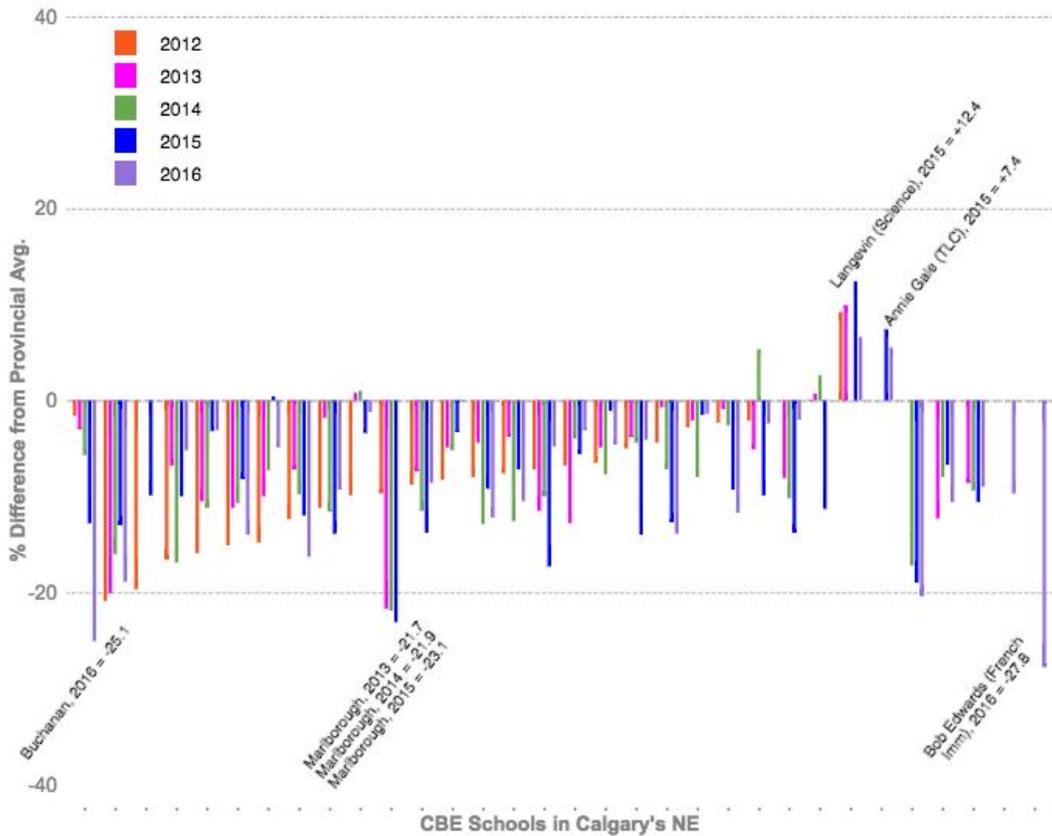
Grade 6 Math PAT: % Schools Below Provincial Average



Data source: Alberta Education



CBE Schools in Calgary's NE: Grade 6 Math PAT School Average Compared to Provincial Average



Data source: Alberta Education

Impact on students: today and in the future

Unless the downward slide in math performance is addressed immediately, many students will continue to fall far behind their peers. Math education is cumulative -- as children fall further behind it becomes more difficult to catch up -- which is why the failure rate increases dramatically from 21% in grade 6 to 56% in grade 12 (including those failing Math 30-1 and 30-2 and those not writing).



Low math competency negatively impacts student access to postsecondary programs. The recent Mathematics Review submitted to the Premier shows that 81% of university programs in Calgary require a math prerequisite as well as 38% of college programs.² Current results mean that many students will unnecessarily be precluded from many enriching career pathways, including STEAM (science, technology, engineering, arts and math) careers. With the increased importance placed on diversifying Alberta's economy, this issue has serious long-term consequences.

The considerable spike in private tutoring indicates that parents are also well aware of these math performance issues and are turning to private tutoring to address gaps in their own child's math learning.³ However, many families cannot afford private tutoring and while it goes a long way to support individual students, it may mask the systemic problem.

Shift to inquiry-based math

There are three primary causes of the downward trend in math performance. The first is the shift to inquiry-based math. The CBE has been an aggressive adopter of inquiry-based math (sometimes referred to as discovery math) which data shows has had a major impact on math results. The CCSD has not focused on inquiry-based math and has not faced the same dismal math scores.

The CBE's Traditional Learning Centre (TLC) programs greatly outperform the average school, and is the bright spot in schools in Calgary's northeast. This comes as no surprise to Stuart Wachowicz, former Director of Curriculum Development for Edmonton Public Schools and developer of the Cogito program in Edmonton. He categorically rejects demographics as the reason for poor math performance, saying:

"When we developed the Cogito program, which the CBE used as a model for its TLC program, one of the exciting results was that children from a low income, high English as a Second Language background were actually outperforming their counterparts from wealthier areas. There is no reason for these children not to excel at the same rate as their counterparts, nor should we do them the disservice to lower our expectations for them."

² *Mathematics Review - Report to Premier and Minister*, December 2016, Mathematics Curriculum Review Working Group

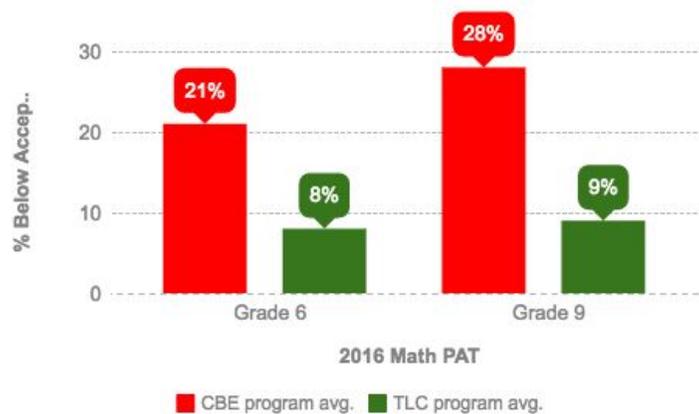
https://education.alberta.ca/media/3402136/final_mathematics-curriculum-review_05dec16pdf.pdf

³ <http://calgaryherald.com/opinion/columnists/staples-failure-of-schools-leads-to-two-tier-public-education>



If socioeconomic factors were the reason behind poor performance in northeast Calgary, we would see these results mirrored at CCSD schools and at Almadina Charter School. Yet with 100% English Language Learners, Almadina significantly outperforms both the CBE and the Provincial average..

TLC Reduces Math Failure Rate by an Average of 2/3



Data source: Alberta Education

High administrative costs take funds out of the classroom

The CBE is operating inefficiently and that means less money in the classroom where it is needed most. The CBE previously publicly confirmed 21-25% of revenue is directed toward administration and school support costs. In comparison, the Catholic School Board spends 8.8%. Changing reporting at the CBE makes it difficult to accurately compare financials from year to year. However, even with the most recent update, it appears that at least \$110 million would flow to the classrooms if the CBE adopted the CCSD's commitment to lower overhead.⁴ More funds in the classroom would free up funds for initiatives at the classroom and school-level that would have a positive impact on math performance.

⁴ For more on high administrative spending, see Kids Come First's report Funding the Front Lines: <https://kidscomefirst.ca/2017/01/17/education-funding/> <https://www.metronews.ca/news/calgary/2016/10/05/cbe-plans-ram-review-in-2-years-capscc-wants-action-sooner.htm> and <http://www.metronews.ca/news/calgary/2015/09/21/parent-group-asks-government-to-review-cbe-school-funding.html>



Acknowledging the problem

Despite the data clearly showing the downward trend in math performance, the CBE has generally minimized the scope of the problem. In June 2016, CBE Trustee Trina Hurdman brought forward a motion to recognize the concern regarding grade 6 math scores but the motion was voted down. Dissenters included Trustee Pamela King and Trustee Lynn Ferguson, both Trustees representing the majority of Calgary's northeast where students are struggling most. When the current group of Trustees was elected, more students were achieving excellence than failing. Today the opposite is true and the current Board of Trustees has overseen the largest drop in student achievement in math in recent memory.

In October 2016, the CBE press release regarding PAT results makes only a brief reference to math results, noting vaguely: "We have noted some improvements in math, and we want to support further improvement over time."⁵

The CBE has recently committed to undertaking a consultation on math with all stakeholders. Yet his underperformance at CBE has been going on for a number of years; the northeast data in particular has not changed in at least the last two years. Given the length of time math has been an issue, it is reasonable to expect that the CBE would be at the point of implementing concrete solutions rather than embarking on a lengthy and costly consultation process.

Addressing math at the Provincial level

In 2015, Education Minister David Eggen clearly acknowledged that there is a province-wide problem with math.⁶ In December 2016, he announced a \$2 million provincial initiative on math that includes adding back the written portion of the high school diploma exam in math, banning calculators from part of the Grade 9 math PAT and offering a \$2,000 bursary for teachers to acquire additional training.⁷ Although these are welcome baby steps, they fall short of making immediate and concrete changes that will have a demonstrable positive impact on students. With regard to the bursary program, few details have been released and there appears to be no

5

<http://cbe.ab.ca/news-centre/Pages/cbe-celebrates-student-achievement-on-provincial-achievement-tests-and-diploma-exams-2016.aspx>

⁶ <http://calgaryherald.com/news/politics/eggen-worried-about-sliding-math-scores>

⁷ <https://www.alberta.ca/release.cfm?xID=4496751C95F9A-C376-BDD7-5D226ED2F103D97E>



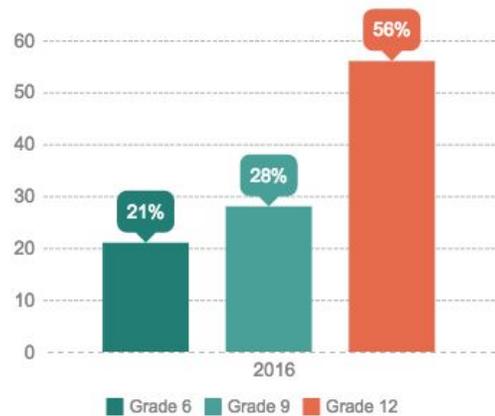
mechanism in place -- or even guidance provided -- to ensure that these funds are spent on professional development that will support improved math results.

Six months into the process, the Province has not released the names of the participants involved in the major curriculum overhaul. Given that Minister Eggen has advised that this curriculum will be transformative, parents and the public deserve to know who is involved and how the groups are structured. Months into the curriculum redesign, the public does not have access to this information. Given the far-reaching impact of education on students and on society as a whole, these issues deserve the highest level of transparency.

Also troubling is Minister Eggen's refusal to meet with key independent parental math advocates. Dr. Tran Davies has collected over 20,000 signatures on a petition to improve math in Alberta and sought a meeting with Minister Eggen to discuss solutions. In July 2016, the Minister's office sent a letter advising they would no longer even respond to her inquiries.

Province-wide, there is a dramatic increase in the math failure rate between grades 6 and 12. It is important that children have as many options open as possible as they decide their future beyond grade 12, thus emphasizing the importance of a strong foundation being laid by grade 6.

Alberta Provincial Math Failure Rate



Note on the data: For Grades 6 and 9, figures show % students failing the Math PAT. For Grade 12, figures include students failing Math 30-1 or 30-2 diploma exam and students not writing.



Data source: Alberta Education



Kids Come First's Action Plan on Math

Kids Come First remains optimistic for the future and firm in its conviction that bringing together the right people and talents along with clear, practical solutions, we can overcome these challenges and give the children of Alberta the skills they need to realize success in a modern and fast-paced world. Kids Come First has developed a five point plan that aims to bring immediate solutions by getting needed resources into the hands of students this spring and providing independent oversight of progress to fix this situation.

1. **Drive a dedicated fundraising campaign to give struggling students free math workbooks.**

JUMP Math (<http://www.jumpmath.org>) is an approved resource for Alberta Education. They are a research-based, award-winning Canadian charity that works to enhance numeracy skills in students. They offer educators and parents a wide range of materials and training guides to help all students, including online lesson plans for teachers. Through a dedicated fundraising campaign, Kids Come First aims to make these materials available to students and parents in underperforming schools. Parents need real tools they can use at home to help ensure their children are making progress.

2. **Call on the Government of Alberta and the CBE to set aside \$1 million to fund after school tutoring for children at underperforming schools – beginning March 1, 2017.**

The Boys and Girls Clubs of Calgary have partnered with JUMP Math to provide tutoring and United Way provides high school math tutoring. While Kids Come First believes firmly that school boards and the Province should be primarily responsible for ensuring academic achievement for Alberta's students, the situation is urgent and these charity-based programs are already in place and can be leveraged for the immediate benefit of students.

3. **Empower parents to help their children by providing a practical, easy-to-use resource.**

Kids Come First plans to organize the development of a list of 30 math questions for each grade that a child should be able to complete. This resource will enable parents to monitor their child's progress and support them accordingly. The CBE has been asked



to do this twice in the last year by CAPSC, which represents 40,000 CBE students, but has refused.

4. Establish a joint task force to monitor progress on math at schools in NE Calgary for the next three years.

Kids Come First is calling for the establishment of a Task Force comprised of the CBE, Alberta Education, CAPSC and Kids Come First to monitor the progress of these schools for the next 3 years, and to evaluate and report on the funds that are directly reaching the classroom.

5. Publish multi-year PAT results on school board websites.

This information should be easily accessible on all school board websites so that parents and the public have easy access to this much-needed information and can see the trendline, as Kids Come First has done.⁸

Looking to the Future

Underachievement in math has a detrimental effect on our children. It means too many children are being precluded from the explosive growth of STEAM careers (science, technology, engineering, arts, and math). Even when they do get into these fields, they are struggling. Dr. John Bowman, PhD (Princeton), a mathematics professor at the University of Alberta's Engineering department, advises that the program has seen a deterioration of skills over the past several years at the university level. Even those students who are achieving high marks (85%+) to get into engineering are struggling with basic functions.

There is much talk in Alberta about the need to diversify our economy and STEAM careers should be a big part of that. How will Alberta replace the 100,000 high paying jobs lost in this current recession – the worst in decades? STEAM opportunities are significant and growing, but only if our students have the necessary background.

⁸ Kids Come First has published this information for Calgary schools on our Test Scores page: <https://kidscomefirst.ca/test-scores/>