

CHAMPIONING IMPACTFUL TRANSFORMATION

CENTRE FOR EDUCATION IN
MATHEMATICS AND COMPUTING



UNIVERSITY OF
WATERLOO



The CENTRE for EDUCATION in
MATHEMATICS and COMPUTING

CEMC.UWATERLOO.CA

LETTER FROM THE DIRECTOR

IAN VANDERBURGH





Finally, a year that started to resemble something approaching normal! The last three years have been an incredibly rough ride for the educational system, from the months of homeschooling children to the incredible challenges that teachers faced in trying to recreate their professional practice in an online environment to the lost learning that so many students in Canada and around the world have had to endure.

But this year we have finally seen hope that the worst is behind us. In the Centre for Education in Mathematics and Computing (CEMC), we have seen a return to pre-pandemic levels of participation in many of our activities, like our internationally renowned mathematics and computing contests. We have also seen the return to face-to-face interaction with students and teachers in Canada and worldwide. Like many of my colleagues, I felt a bit rusty the first time I was in front of a group of secondary school students (this first group was in Halifax), but it felt so good to be able to support teachers in spreading a love of mathematics and computer science. While long-standing CEMC activities continue to flourish, some are adapted to the needs of education in 2023 and other amazing opportunities appear, both in Canada and further afield, taking us to countries in Africa, India, and elsewhere.

Within this report, you will read about many of the amazing activities and resources that my colleagues create and provide, almost always at low or no cost, to thousands of teachers and hundreds of thousands of students worldwide on an annual basis. This impactful work is made possible by many generous people who have chosen to give back to the CEMC, whether by volunteering to be markers of our mathematics contests (like Jane Robinson), by enabling the CEMC's efforts to support mathematics in Indigenous communities (like the current Dean of the Faculty of Mathematics, Mark Giesbrecht and his wife Tian Kou), or by believing in a new and innovative vision for what the CEMC could do (like former Dean and Provost Alan George).

Mathematics and computing education worldwide needs the CEMC to provide relevant and rigorous opportunities for students and teachers, all in the name of increasing their confidence, enjoyment, interest, and ability.

Thank you for your support of our work!

IAN VANDERBURGH

DIRECTOR, CENTRE FOR EDUCATION IN MATHEMATICS AND COMPUTING

CEMC'S PROBLEM OF THE WEEK ACHIEVES A MILESTONE OF 50 000 SUBSCRIBERS

SUPPORTING EDUCATORS AND STUDENTS WITH MATH PROBLEM SOLVING RESOURCES

BY LATA PUNETHA

The Centre for Education in Mathematics and Computing (CEMC), housed in the Faculty of Mathematics at the University of Waterloo, began 2023 with a milestone achievement. Problem of the Week, CEMC's global initiative providing problem resources at five different levels to educators every week had crossed a subscriber base of 50 000. Launched by the CEMC in 2011, Problem of the Week aims to equip educators with math resources to help inspire students towards a greater interest in math in class every week.

"I WANT TO SAY THANKS FOR THE C, D AND E PROBLEMS. THE PROGRESSION OF THE CONCEPTS ALLOWS ME TO USE THEM FOR MY MATH CLUB EACH WEEK."

- GRADE 6/7 MATH TEACHER



Problem of the Week, as the name suggests, is a digital resource consisting of one mathematical problem at five different levels shared with subscribers every week. These problems are meant for students from Grade 3 to Grade 12 and are organized into themes, grouping them into various areas of the curriculum, carefully created by experts at the CEMC. Educators utilize these resources to present students with a variety of mathematical opportunities, improving their ability to solve problems of different topics in a non-sequential manner. Additionally, these problems and their solutions are posted on the CEMC's website and are available publicly for non-subscribers as well. There has been an average growth of more than 20% annually in the number of unique subscribers. The subscriber base primarily consists of educators from across Canada and internationally.

With over 1600 problems posted since 2011, Problem of the Week aims to create an interest and enjoyment in math classrooms. Through our vast subscriber base of educators spread worldwide, Problem of the Week reaches about 1.4 million individuals on a weekly basis introducing them to the University of Waterloo via the CEMC. "As we celebrate a milestone of 50 000 subscribers, the CEMC is committed to continue our effort to provide educators and learners with resources, challenges and opportunities to increase confidence, enjoyment and ability in mathematics and computer science," said Ian VanderBurgh, Director, CEMC commenting on this accomplishment.

We invite you to explore our educator tools at cemc.uwaterloo.ca.

"I JUST WANTED TO SEND YOU A QUICK NOTE TO LET YOUR TEAM KNOW THAT MY STUDENTS HAVE REALLY ENJOYED THE PROBLEM OF THE WEEK QUESTIONS AND SOLUTIONS. APPLYING THEIR MATHEMATICAL KNOWLEDGE TO REAL-LIFE SITUATIONS HAS HELPED THEM TO REALIZE THE RELEVANCE AND IMPORTANCE OF THE CONCEPTS TAUGHT IN CLASS."

- GRADE 6/7 MATH TEACHER

"THANK YOU FOR PROVIDING A WEEKLY MATH PROBLEM FOR MY GRADE 3 CLASS. LOVE THE DIGITAL WORKSHEET OPTION."

- GRADE 3 TEACHER

"THANK YOU SO MUCH FOR THESE FANTASTIC PROBLEMS! THEY ARE REALLY AMAZING CHALLENGES FOR MY CLASS."

- GRADE 5/6 TEACHER

REMEMBERING RON DUNKLEY

**HONOURING THE CEMC'S FOUNDING
DIRECTOR'S LIFE AND IMPACT**

BY LATA PUNETHA

It is with heavy hearts that we bid farewell to a true visionary and leader, Ronald (Ron) Garth Dunkley, long-time faculty member in the Faculty of Mathematics at the University of Waterloo, the founding director of the Centre for Education in Mathematics and Computing (CEMC), and the co-creator of the Canadian Mathematics Competition. Ron passed away on February 19, 2023, after a brief illness. In this tribute, we celebrate Ron's life, honour his legacy and remember him for the many ways in which he enriched our lives and the lives of countless others.

Ron began his career as a high school mathematics teacher at Kingsville D.H.S and later at St. Mary's D.C.V.S. where he was department head. The idea which led to the ultimate creation of the CEMC was born at a professional development workshop for high school mathematics teachers in 1962. Four high school mathematics teachers were concerned that their students were not prepared for American high school math contests and decided to launch a mathematics contest for high school students in District 10 (where the four of them taught), helping these students improve their mathematical problem-solving abilities. These four educators - Ron Dunkley, Ed Anderson, Don Attridge and Bill Nediger collaborated with Ralph Stanton and Ken Fryer from the University of Waterloo and a few days later, the math contests were born.



Roughly 350 local students attempted the District 10 mathematics contest in the first year. Over the course of six decades, one contest became a dozen contests which reach students in various grades, starting from Grade 7, and the contests moved formally under the University's umbrella. Today, more than 265 000 students in over 80 countries register for the various contests offered by the CEMC. The contests are not only geared towards students but also facilitate the growth and support of a network of mathematics teachers on a global level, through contest development meetings and marking events. By offering a platform that fosters professional development, these contests allow teachers from different schools to interact and share innovative ideas.

Steve Brown, Professor Emeritus from the Department of Statistics and Actuarial Science and a former Director of the CEMC, adds, "Ron would say that schools had sports programs for talented athletes that involved students, coaches and practicing for competitions, so why not have something similar for talented math students?" Teachers who are invited to sit on committees to prepare the contests view this as valuable professional development. Students who do well on the contests come to the attention of the math faculty at an early age. These contests are one very important reason for the success of the Faculty of Math at Waterloo in attracting some of the best students

from across Canada. Ron loved to talk about the young math students that he met through the contests, and how he was amazed at how brilliant they were. He would talk about students from every era of his time at Waterloo with affection and admiration.

After collaborating with the University of Waterloo for the Canadian Mathematics Competitions, Ron's association with the institution grew stronger, and in 1967, he joined the University of Waterloo. He dedicated the better part of his career to the University, gradually climbing up the ranks to become the Associate Dean in the Faculty of Mathematics and the Director of the Centre for Education in Mathematics and Computing when it was founded in 1995. As part of his efforts to promote the university, Ron was a pivotal member of the team that visited schools across the country to identify and recruit young talent. During these visits, he even used his musical talent and played the trumpet to attract students to Waterloo. His enthusiastic efforts influenced many talented students to join Waterloo, significantly contributing to the early development of the Faculty of Mathematics.

As a founder of the World Federation of National Mathematics Competitions, Ron held the prestigious position of its president. He also served as the Deputy Leader of the Canadian Team for the International Math Olympiad in 1986, a role that brought him immense pride. Ron's unwavering dedication to



“I WILL REMEMBER HIM WITH SUCH ADMIRATION. HE WAS ONE OF THOSE VERY SPECIAL FEW THAT CREATED A CULTURE THAT PERMITTED THE UNIVERSITY OF WATERLOO TO BECOME THE MOST INNOVATIVE HIGHER EDUCATION ENTERPRISE IN CANADA’S LAST HALF CENTURY. HE WAS THE COLLABORATIVE LEADER PAR EXCELLENCE BRINGING OTHER GOOD SOULS TO THE IDEAS AND THEN EXECUTING ON THEM. IN ALL OF THIS HE WAS SUCH AN INSPIRATION TO OTHERS.”

– RT. HON. DAVID JOHNSTON,
FORMER GOVERNOR GENERAL OF CANADA AND
FORMER PRESIDENT, UNIVERSITY OF WATERLOO

mathematics education earned him several accolades in Canada. In recognition of his instrumental work in developing mathematics contests in Canada, he was appointed a Member of the Order of Canada in 1996. Ron also received numerous other awards, including the Descartes Medal in 1987, the Paul Erdős Award in 1994, and the Adrien Pouliot Award for his significant contributions to Mathematics Education in 1997.

Remembering Ron, Rt. Hon. David Johnston, former Governor General of Canada and former President, University of Waterloo, shares, “I will remember him with such admiration. He was one of those very special few that created a culture that permitted the University of Waterloo to become the most innovative higher education enterprise in Canada’s last half century. He was the collaborative leader par excellence bringing other good souls to the ideas and then executing on them. In all of this he was such an inspiration to others.”

Ron was a man of varied interests – he loved music since a young age and he played brass instruments, performing with the Salvation Army Band, Weston Silver Band, and the University of Waterloo



The 1990 C.M.C. Executive Committee.

Front Row: Ron Scoins, Bonnie Findlay, Betty Weber, Ed Anderson

Back row: Larry Davidson, Ron Dunkley, Barry Ferguson, Lloyd Auckland

Symphony, as well as serving as chair of the board of the Kitchener-Waterloo Symphony. Ron had a strong interest in sports, having worked as the statistician for the Warriors football, hockey and basketball teams during their early days. In addition, he participated in several matches with the “Waterloo Worriers”, an old-timers hockey team, which comprised faculty and staff who got together on Wednesday nights for pick-up hockey. These matches provided an opportunity for friendly banter and post-game refreshments in the locker room.

Bev Marshman, Adjunct Associate Professor at the CEMC, shared an anecdote about Ron’s congenial nature, “I have one very warm memory of an early afternoon on Christmas Eve. I was in my office working on some exam grades, and Ron came to my door and invited me to join him with a small group who had gathered in the dean’s office to offer one another good cheer on this cold winter day ... a small gift of inclusion that meant a lot. That’s the kind of man he was.”

He was a passionate leader and a delightful colleague, with a remarkable eagerness to embrace novel ideas.

But above all, he was a math educator at heart, who dedicated a significant portion of his career to empowering students with the tools to unlock their potential and revel in the joys of mathematics. Together with his colleagues, he worked tirelessly on projects aimed at helping students overcome math phobia and discover their passion for the subject. His unwavering support and enthusiasm were instrumental in driving the extraordinary growth and success of CEMC.

“Over a period of more than 40 years, Ron worked tirelessly to promote mathematics and to inspire young people to consider math in a new light. All of us in the CEMC are proud to continue the work that he and others started,” says Ian VanderBurgh, current Director of the CEMC.

Today, we take solace in the knowledge that he touched the lives of so many and made a lasting impact at the CEMC, the Faculty of Mathematics at the University of Waterloo and the wider academic community. We honour Ron’s contributions, admire his achievements and express our gratitude for his invaluable presence in our lives.

PROGRAM SNAPSHOT: CEMC VISITS SCHOOLS

The CEMC visits schools all over the world to meet with both students and educators of mathematics and computer science. Specifically, we work with interested and able Grade 7 to 12 students and educators. Our goal is to have fun with mathematics and/or computer science by solving engaging problems together:

- › **TO SHARE OUR ENTHUSIASM AND ENJOYMENT OF THE SUBJECTS,**
- › **TO HIGHLIGHT THE IMPORTANCE OF MATHEMATICS AND COMPUTER SCIENCE, AND**
- › **TO ENCOURAGE STUDENTS TO WORK BOTH INSIDE AND OUTSIDE THE CURRICULUM TO DEVELOP THEIR OWN PROBLEM-SOLVING SKILLS.**

IN THE LAST SCHOOL YEAR, CEMC VISITED:



MORE THAN

**6000 STUDENTS IN
THEIR CLASSROOMS**

MORE THAN

150 SCHOOLS ACROSS

- > CANADA
- > GHANA
- > INDIA
- > INDONESIA
- > JAMAICA
- > KENYA
- > KOREA
- > OMAN
- > QATAR
- > TAIWAN
- > UNITED STATES OF AMERICA



DRIVING POSITIVE CHANGE

CEMC'S IMPACTFUL JOURNEY ACROSS AFRICA

BY LATA PUNETHA

Over the last two years, the team at Centre for Education in Mathematics and Computing (CEMC) has made great strides in their work across three countries in Africa, moving from aspirations in Spring and Summer 2021 to activities that involve working with hundreds of educators and inspiring tens of thousands of students.

Through this work, the central objectives have been:

- › promotion of a problem-solving mindset,
- › working with educators to improve their mathematical skills,
- › encouraging young women to see a future for themselves in mathematics, and
- › developing capacity within partners for broad-based activities.

GHANA

In Ghana, the main activities to date have been with the African Institute for Mathematical Sciences (AIMS) Ghana, through a yearlong program for girls, ongoing teacher professional development and school visits. Over the next year, the CEMC intends to work towards courseware localization. Additionally, the CEMC aims to support teacher training at one or two Universities.



RWANDA

In partnership with AIMS Rwanda, the CEMC has prioritized contest development, supporting their work to provide engaging extra-curricular activities to tens of thousands of students across the country. As a next step, the CEMC hopes to solidify and expand contest offerings, perhaps extending to other African countries.

KENYA

In Kenya, the CEMC has concentrated their effort on promotion of problem solving and offering contests. In the near future, the CEMC hopes to solidify the progress on contest infrastructure, setting up the system there for continued expansion and success, to begin working with at least one additional university, and to participate in national conversations about curriculum reform.

CEMC's Comfort Mintah, Wesley Korir and Ian VanderBurgh have been keenly involved in this project and continue to work through various challenges to drive positive change in the field of mathematics via capacity building and education. Through collaborative efforts and strategic planning, the CEMC has been able to create impact in the first phase of their work in Africa. The CEMC continues to advocate for focus and investment in Africa as a part of their goal of empowering the student and educator community in the region.

“Thanks for the inspiring and wonderful training.

It really motivated me to change my approach towards solving mathematical problems. I can honestly say that putting your tips and tools into practice has made me feel more confident about my dream of being a good teacher. This training has also helped me to figure out my areas of weakness in order to polish them and be better.

The sessions were excellent, and they really made me stop and think about where I'm going and how I am using my time. I was challenged by my fellow participants who confidently contributed during the sessions.”

- ONLINE TEACHER TRAINING PARTICIPANT

FROM MARKERS TO SUPPORTERS: IMPROVING STUDENT'S MATH ABILITIES THROUGH PROFESSIONAL GROWTH AND GIVING

HOW MATHEMATICS EDUCATORS ARE VOLUNTEERING THEIR TIME AND EXPERTISE WITH THE CEMC

BY LATA PUNETHA

For more than 50 years, a passionate group of mathematics educators from across Canada have been uniting to work together with the Centre for Education in Mathematics and Computing (CEMC) to provide feedback to students keen to improve their mathematical abilities via contest marking. From an initial team of fewer than ten markers in 1962 to a current group of almost 350 in 2023, we have witnessed math educators consistently returning every year to provide their support in marking contests for the CEMC. These events take place twice a year to mark the Euclid, Fryer, Galois, Hypatia and the Canadian Senior and Intermediate Mathematics Contests. More recently, markers participate both in-person and remotely at these events, allowing more markers to contribute. When the contests began in 1962, they were initially restricted to Ontario. Today, students from over 80 countries participate in these math contests.



PROBLEM-SOLVING TECHNIQUES

Participation in the marking events gives math educators the opportunity to assess contest papers of students from outside their school. This means identifying different problem-solving techniques and opening their eyes to various layouts and approaches. Markers are instructed to focus on the process used by the students to solve problems, rather than just the outcome. Educators find immense value in examining the work of different students. Contests help educators identify patterns where students consistently make mistakes and understand how students from different geographical locations approach the same math problems in different ways. This insight assists them in returning to their classrooms and explaining concepts differently to their students or teaching them more efficient solution techniques that they learned from other educators at the event or from contest papers.

Laurissa Werhun, a mathematics educator and marker from Toronto, Ontario, says, “math is a global unifier – there may be countless ways to solve the same math problem. Marking contest papers from students of diverse geographical backgrounds enhances our understanding of different mathematical approaches and often serves as a valuable learning experience for us

teachers. Connecting with different math teachers at the CEMC marking events makes us aware of how to cater to students with varying math abilities, thereby improving our teaching skills!”

PROFESSIONAL DEVELOPMENT

The demographic at marking events ranges from current undergraduate mathematics students to math educators, math enthusiasts working in industry, university faculty members and retired educators. Collaboration with other math educators helps markers share notes about what is working in their classrooms. Educators find that these shared experiences are crucial to help them understand their students better and help them in their journey with mathematics. For a secondary school educator, this could be learning about the intricacies of running a math club and training students for contests, for a university instructor it could help them understand the diversity that mathematics can bring into their classroom as they welcome international students and for a young educator these events turn out to be a fantastic training ground to learn about different problem-solving methods.

Jane Robinson, a University of Waterloo alum and a marker for over 30 years, shares, “These events gave us an



“THE UNIVERSITY OF WATERLOO GOT ME A SUCCESSFUL CAREER, PARTICIPATING IN THE EVENTS ORGANIZED BY THE CEMC BROUGHT ME BACK HOME – GIVING ME THE ABILITY TO CONTRIBUTE TO THE FUTURE OF MANY OTHER SUCH STUDENTS THAT COULD COME TO THE UNIVERSITY EVENTUALLY, WITH THE POTENTIAL TO CREATE A POSITIVE RIPPLE EFFECT AS THESE STUDENTS, IN TURN, PAY IT FORWARD TO FUTURE GENERATIONS.”

– BETTY MADTER, A UNIVERSITY OF WATERLOO ALUM AND RETIRED MATH EDUCATOR

opportunity to work alongside people who were our role models in the math world. We were able to share ideas, learn from one another and leave inspired to come back – year after year – and contribute to the CEMC.”

Above all, these events bring together a group of mathematicians who are looking for a challenge, one that they may not be getting enough of during the rest of the year. Krysia Piorczynski, a supporter of the CEMC and wife of the late David Shepherd, a long-time marker and contributor to the CEMC, remembers, “Math teachers often lack the opportunity to challenge themselves on a daily basis while teaching students at a specific grade level as they need to stick to the curriculum. However, marking events provide them with a chance to push their limits a bit further. David, motivated by these events, would practice more math to take part in them. It was at the CEMC where he truly discovered his potential, as it presented challenges that went beyond the ordinary, urging him to strive to be better, year after year.”

CREATING A STRONG MATH COMMUNITY

Most markers do not see each other all year and meet periodically only at marking events. These events help foster deep relationships and connections among like-minded mathematicians. Thomas Griffiths, a retired mathematics educator from London, Ontario shares that



it is the “people” that make him come back to this event for over the last 50 years. Finding a group of people under one roof that are passionate about mathematics, understand the same kind of math humour and with a similar zeal to make mathematics interesting and fun for their students is not an easy task. While educators may be exposed to events in their own school board, the marking event gives them a chance to connect with math educators from across Canada and now virtually in other countries too! Some educators feel that marking events are a great way to introduce new educators into the world of programming and to help them make meaningful math connections. Christopher Ing, a mathematics educator and marker from Windsor, Ontario talks about his experience, “I’ve been involved in marking for over two decades now. Right after University, I started marking alongside my math teachers. And now, even some of my students volunteer their time for this purpose. It’s amazing how life comes full circle, with multiple generations working together at these marking events organized by the CEMC, all striving for one common goal: empowering students to do better in mathematics”

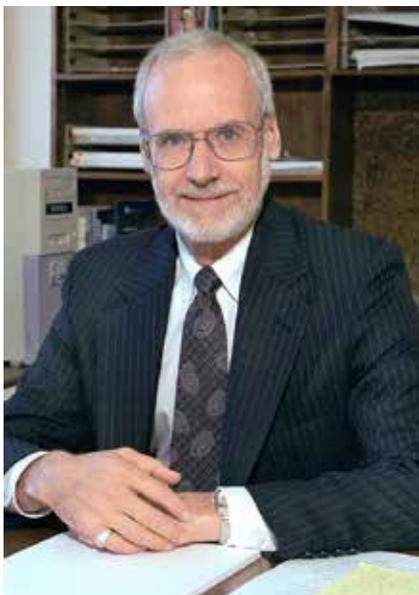
INVESTING TIME AND SUPPORT

Math educators over the years have invested time and some even invest financial resources to create a positive impact and drive meaningful change through the CEMC. These educators have recognized the potential within the younger generation, which has motivated them to donate and contribute, ensuring that these students have access to improved math resources and opportunities, leading to better outcomes. Betty Madter, a University of Waterloo alum and retired math educator, shares, “The University of Waterloo got me a successful career, participating in the events organized by the CEMC brought me back home – giving me the ability to contribute to the future of many other such students that could come to the university eventually, with the potential to create a positive ripple effect as these students, in turn, pay it forward to future generations.”

WHY WATERLOO'S "MAN FOR ALL SEASONS" SUPPORTS THE CEMC ELEMENTARY SCHOOL INNOVATION FUND

DISTINGUISHED PROFESSOR EMERITUS ALAN GEORGE BUILDS ON HIS REMARKABLE LEGACY WITH A RECENT GIFT TO THE CEMC

BY ROBIN MORDEN



Distinguished Professor Emeritus Alan George used to joke that he couldn't keep a job. In truth, he so excelled in his many roles with the University that he was continually offered new ones. In his long and illustrious career, he was Dean of the Faculty of Mathematics twice (1980-1986, 1998-2005); Vice-President, Academic and Provost (1988-1993); Associate Provost, Information Systems and Technology (2003-2012); interim Vice-President, University Research (2006-2007); and interim Dean of Graduate Studies (2007-2009).

Dr. George balanced these leadership duties with a remarkable research career for which he was recognized with the Governor-General's Commemorative Medal for the 125th Anniversary of Canada, the Canadian Applied and Industrial Mathematics Society Research Prize and a lifetime achievement award from the Canadian Association of Computer Science. He is a Fellow of the Royal Society of Canada, the Society of Industrial and Applied Mathematics and the Institute of Electrical and Electronics Engineers.

University historian Kenneth McLaughlin (BA '65), recognizing Dr. George's service to the University, dubbed him a "man for all seasons" in the University of Waterloo's 50th-anniversary book *Out of the Shadow of Orthodoxy*.

And his impact on the University continues in retirement. Recently, Dr. George donated \$200,000 to the CEMC's Elementary School Innovation Fund. This built on an already impressive legacy of giving that included the creation of the J. Alan George Leadership Award and the IST Staff Appreciation Fund.

Thanks to Dr. George and other donors, the CEMC's new Elementary School Innovation Fund will help develop free online courseware and accompanying materials that cover the mathematical content taught in Grades 4/5/6 in ways that are accessible and appropriate for these younger audiences and their teachers. CEMC already offers similar courseware for students in Grades 7 to 12, and it has proven wildly successful, particularly during the pandemic when demand for the materials skyrocketed.

NUMERACY FOR ALL: THE EVOLUTION OF THE FACULTY'S FOUNDING VISION

Dr. George describes himself as having been a "fan of the CEMC forever." In Dr. George's view, the CEMC is the continuation of an ambition that originated with one of the founders of the Faculty of Mathematics, Ralph Stanton.

"Stanton did some forward-looking things," says Dr. George. "One of these was to hire a couple of very well-connected high school teachers – Ron Dunkley and Ken Fryer – who, in addition to their professorial duties, traveled around to Ontario high schools and gave presentations."

These were not garden-variety recruitment talks, which were rare and even frowned upon in those days, but rather in-depth lectures about things like number theory. Dr. George had the opportunity to attend several and saw firsthand how the speakers captivated their audience.

"You could just see the students just go, 'Wow, this is so interesting,'" says Dr. George.

While these presentations likely spurred applications to the University of Waterloo, this was not their primary purpose. Rather, they were intended to promote numeracy and interest in mathematics in the broader community. From early on, the Faculty of Mathematics saw its role not just as educating those students who walked through its halls, but all learners, no matter where they lived or what they aspired to become in life.

The CEMC evolved out of this vision. Indeed, Ron Dunkley went on to become its founding director.

"There are several reasons why I am such a big fan of the CEMC," says Dr. George. "First, over the years, it has enlarged its contest offerings to appeal to students of

"THERE ARE SEVERAL REASONS WHY I AM SUCH A BIG FAN OF THE CEMC," SAYS DR. GEORGE. "FIRST, OVER THE YEARS, IT HAS ENLARGED ITS CONTEST OFFERINGS TO APPEAL TO STUDENTS OF INCREASINGLY JUNIOR LEVELS. SECOND, IT HAS FOCUSED ON ENCOURAGING INTEREST IN MATHEMATICS AND COMPUTER SCIENCE AMONG YOUNG GIRLS. FINALLY, IT HAS EXPANDED ITS FOOTPRINT GEOGRAPHICALLY: IT FOCUSES NOT ONLY ON STUDENTS AND TEACHERS IN CANADA OR NORTH AMERICA, BUT STUDENTS AND TEACHERS WORLDWIDE."

– DR. GEORGE, DISTINGUISHED PROFESSOR EMERITUS

increasingly junior levels. Second, it has focused on encouraging interest in mathematics and computer science among young girls. Finally, it has expanded its footprint geographically: it focuses not only on students and teachers in Canada or North America, but students and teachers worldwide."

To Dr. George's point, more than 265 000 students in over 80 countries register for the CEMC's 15 contests each year, and 6000 students benefit each year from the CEMC Visits Schools program at more than 150 schools in over 15 countries.

Dr. George also commends the CEMC for its understanding of the importance of teachers. "I think the CEMC does a marvelous job of not just encouraging interest in math and computing among students, but they recognize that teachers are crucial to that endeavor," says Dr. George.

Having seen the impact of Dunkley and Fryer's talks, and himself become an influential teacher, Dr. George knows the difference that educators can make. And exceptional teachers have never been more necessary to our school system. Dr. George notes the "profound" negative impacts of the pandemic on childhood education.

But Dr. George believes the CEMC can offset these effects, especially given its penchant for "growing and evolving and always seeing the bigger picture."



The **CENTRE** for **EDUCATION** in
MATHEMATICS and **COMPUTING**

UNIVERSITY OF
WATERLOO



THE CENTRE FOR EDUCATION IN MATHEMATICS AND COMPUTING
200 UNIVERSITY AVE. W., WATERLOO, ON, CANADA N2L 3G1

cemc.uwaterloo.ca