

## Learners challenged to combine art, maths in unique competition

**REPORTER**  
 ISHAI led learners, university students and teachers across Nelson Mandela Bay to create art in the city's first Math-Art Competition, which kicked off on March 3.

"There is so much maths in art and so much art in maths," said competition co-ordinator Carine Steyn from Nelson Mandela University's Gova Mbeki Mathematics Development Centre (GMMDC), which is running the competition in consultation with the university's School of Music, Art and Design (SoMAD) and the Department of Basic Education.

Entrants can turn to nature for inspiration, where flowers use really neat parables and make a masterpiece of symmetry and perfect angles. They can also be inspired by abstract maths, which are mathematically correct designs that are a part of traditional culture, including the beaded houses and Xhosa beaded headbands.

"What we are looking for is a beautiful drawing, created using maths," said Steyn. "It can be a drawing based on the competition idea, 'We are piloting the competition this year and hope to make it an annual event.' The Math-Art Competition also feeds into the broader science, technology, engineering, arts and mathematics (STEM) development work of the GMMDC, and will be open to learners and teachers participating in our projects across the province."

The competition has two main categories: one linked to the Grade 8 to 12 CAPS curriculum, where entrants have to use maths concepts such as to design art and the other an open category, which would include any artwork with a link to maths, including ethno-mathematics.

"The competition is valuable because it usually means that, separate entities, and that's what we are looking for," said Rachel Collett, a lecturer in SoMAD's Visual Arts Department. "In school and at university, subjects are usually taught as separate entities, and there are reasons for this, but, of course, knowledge is actually connected and so is our imagination."

"It is good for learners to explore links between subjects because that can help them to become independent and critical creative learners," said Steyn. "We are encouraging art and science teachers to enter and to encourage their learners to enter. The competition is not about artistic techniques, but more about the link between maths and art."

The artwork must be two-dimensional and A4 to A2 in size and relief work cannot be more than 2cm high. Entrants must submit a 100 to 200-word essay, explaining the link between their artwork and the competition. Prizes, which include tablets, cell phones and art classes, will go to the top-placed candidates and to individuals who receive 'special recommendations' for outstanding creativity. Entries will be judged in three sub-categories: Grade 8 to 9 pupils, Grade 10 to 12 pupils, students and teachers.

The competition closes on May 4, while the top entries will be displayed at a public art gallery in the city from May 19 to 23. The winners will be announced on May 25 at GMMDC's annual GeoGebra Conference, which will also be promoting STEM activities to popularise maths in the classroom.



Steyn Academy Grade 8 pupils, Nelson Oliver Johnson shows how ideas about using maths to make art with Philippe Fabrik. PHOTO: SUPPLIED

## Math-Art competition adds up to creative innovation

**By MANDELLE KWABANA**  
 PUPILS from 98 high schools across the province got to explore maths through art during a first-of-its-kind Math-Art competition.

It was set by Nelson Mandela University's Gova Mbeki Mathematics Development Centre in Port Elizabeth.

"The maths inspired art competition, which kicked off earlier this month, received 153 entries to showcase their drawing skills using maths in their artwork."

The participants are an amalgam of the Nelson Mandela Metropolitan Art Museum in Port Elizabeth until May 25, which is when the winners will be announced.

The chief director, Professor Werner Olivier, said the competition arose from an international effort to break called STEM – the acronym for Science, Technology, Engineering, Art and Maths.

"STEM is a more modern approach to explore the links between maths and art."

"Many entrants linked their creative ideas to nature," said Olivier.

Mafisa Magwanya, who created an abstract art using triangles and circles, is from Kwanaqulu High in Port Elizabeth.

Other nature-inspired pieces included a Pythagorean theorem by Patsima Zulu from Newlandsville and a snake's skin by Shwayo Nkomo from Strathmore High in Tlokweng.

While Steyn Secondary School's Nqo Janda chose to show the link between engineering and geometry



**PILOT PROJECT:** Some of the artwork by high school pupils during the first of its kind Math-Art exhibition hosted by Nelson Mandela University with an innovative car design. Participants in three sub-categories: Grade 8 to 9, Grade 10 to 12, and students and teachers. He hoped the competition, a pilot this year, will go annual next year. PHOTO: SUPPLIED

"They could draw their inspiration from their CAPS maths curriculum at school, or from mathematically correct designs found in nature, such as snowflakes, or traditional culture, such as Xhosa beaded headbands."

"There was so much knowledge and creativity in the submissions they portrayed," said Olivier.

"These entrants were also indicative of the wide representation of young people today. Some of the artwork captured their own unique circumstances," he said.

"We will receive art capsules and tablets at a prize-giving at the gallery during the centre's GeoGebra conference, which is promoting STEM activities to popularise the study of maths."

"He hoped the competition, a pilot this year, will go annual next year."

—mandellekwabana@supa.co.za

## Offline tablets see marks flying

Duncan Village pupils to benefit from project too

**By GQABANE MANDELLE**  
 AFTER the success of a technology-linked maths and science programme at eight schools in the metropolitan area, the Old Mutual Flagship Education Programme (OFEP) has been launched in 10 more schools in the Eastern Cape province.

The programme, which was launched in 2015, has seen the marks of participating Grade 11 and 12 pupils improve a two-year 10% to 15%.

Grade 11 pupils who participated in the OFEP programme at the Duncan Village school, which has 100 learners, saw their marks improve by 10% to 15%.

The programme is a multi-year project, which will see the marks of participating Grade 11 and 12 pupils improve a two-year 10% to 15%.

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**DIGITAL SUPPORT:** Offline video lessons on tablets – along with plenty of other curriculum-aligned content – is making maths and science much easier for pupils at selected high schools across the Eastern Cape. Inset: Prof Werner Olivier. PHOTO: SUPPLIED

Quagga Steyn high schools. Developed by Nelson Mandela University's Gova Mbeki Mathematics Development Centre (GMMDC), the programme "will see the marks of participating Grade 11 and 12 pupils improve a two-year 10% to 15%."

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entirely used, and we are really excited to bring the maths to Duncan Village," said Olivier, who also runs the programme in Nelson Mandela Bay, Mthatha and several other areas, where pupils have had similar or even better results.

"What is beneficial to Duncan Village is that our programme follows a successful IT project which was being run in the schools by Leap Schools and Edmentum (Level), with funding by Old Mutual, so many of the teachers and pupils have already been trained to use IT."

Over the next two years, GMMDC

## Maths inspires art in unique Bay competition

**By Jessica Elabbert - Mar 1, 2018**  
 High school pupils, university students and teachers across Nelson Mandela Bay are being challenged to use maths to create art, in the city's first Math-Art Competition, which kicks off on March 3.

"There is so much maths in art, and so much art in maths," said competition co-ordinator Carine Steyn from Nelson Mandela University's Gova Mbeki Mathematics Development Centre (GMMDC), which is running the competition in consultation with the university's School of Music, Art and Design (SoMAD), and the Department of Basic Education.

Entrants can turn to nature for inspiration, where flowers are really just parabolas and a snake's skin a masterpiece of symmetry and perfect angles. They can also be inspired by ethno-mathematics – which are mathematically-correct designs that are a part of traditional culture, including Ndebele houses and Xhosa beaded work.

"What we are looking for is beautiful drawings, created using maths."

GMMDC director Prof Werner Olivier, who is the driving force behind this competition, said: "We are piloting the competition this year and hope to make it an annual event."

"The Math-Art Competition also feeds into the broader Science, Technology, Engineering, Arts and Mathematics (STEM) development work of the GMMDC, and will include pupils and teachers participating in our projects across the province."

The competition has two main categories – one linked to the Grade 8 to 12 CAPS curriculum, where entrants have to use maths concepts taught at school to design art; and the other an open category, which would include any artwork with a link to maths, including ethno-mathematics.

"The competition is valuable because it crosses discipline boundaries," said Rachel Collett, a lecturer in SoMAD's Visual Arts Department.

"In school and at university, subjects are usually taught as separate entities, and there are reasons for this but, of course, all knowledge is actually connected and requires imagination. It's good for learners to explore links between subjects because that can stimulate independent and critical creative enquiry."

The artworks must be two-dimensional and A4 to A2 in size – and relief work cannot be more than 2cm high. Each entrant must submit a 100 to 200-word essay, explaining the maths-art link in their artwork.

Prizes, which include tablets, cell phones and art classes, will go to the top-placed candidates and to individuals who receive 'special recommendations' for outstanding creativity. Entries will be judged in the following sub-categories: Grade 8 to 9 pupils, Grade 10 to 12 pupils, students and teachers.

The competition closes on May 4, with the top entries displayed at a public art gallery in the city from May 19 to 23. Winners will be announced on May 25, at GMMDC's annual GeoGebra Conference, which will also be promoting STEM activities to popularise maths in the classroom.

Visitors at the conference include the Dean of Arts and other delegates from the University of Budapest, which is a keen promoter of STEM worldwide.

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## New centre in KWT to boost maths and science studies

**KOLLEWA DWESINI**  
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In a bid to help pupils improve their maths and science results, a new centre focusing on the two crucial subjects has been launched in King William's Town.

The Nelson Mandela University's Gova Mbeki Mathematics Development Centre (GMMDC), the Eastern Cape education department and the Old Mutual Flagship Education Programme joined hands to make the initiative a reality.

The centre, located at the department's Zwelitsha provincial headquarters, has started with 30 tablets, onto which GMMDC's teaching and learning model software has been uploaded.

The digital package, called TouchTutor, covers the entire maths and science curriculum from Grade 6 to 12 – and includes PowerPoint lectures, video presentations, video content, calculator emulator, a multilingual glossary of science and maths terms, self-tests and self-test papers with answer sheets.

"The new centre will give many more pupils a chance at improving their maths and science marks. Maths and science

teachers will also benefit," said GMMDC director Professor Werner Olivier.

King William's Town education district director Edgar Katshaza said: "What's particularly important to us about this new resource centre is that learners from schools in this area will benefit from the technological advances in maths and science programmes that have been invented by the Nelson Mandela University's GMMDC, and we believe that this will assist with improving the Eastern Cape pass rate."

Peter Moyo from the Old Mutual Flagship Education Programme said: "There is a shortage of maths and science teachers in South Africa – more particularly in schools that are in the quintile one and two sector, which are disadvantaged schools."

"Through this programme we aim to help solve problems that learners encounter in their studies."

**NEW FREE APP TO BOOST LEARNERS' MATHS AND SCIENCE RESULTS**

For more information about the Math-Art Competition, contact Carine Steyn at [mathartcompetition@gmail.com](mailto:mathartcompetition@gmail.com).

**REPORTER**  
 In many under-resourced schools across South Africa, often with unqualified teachers, learners do not always gain the mathematical knowledge or skills they need to excel at school or to access universities.

To give learners a better chance, Nelson Mandela University's (NMU) Gova Mbeki Mathematics Development Centre (GMMDC) has been using cutting-edge technology to boost teaching and learning in maths and science in secondary schools – and launched its second unique education app on Friday, May 4.

The app, TouchTutor e-Quiz, which is available free on the Google Play Store, provides mobile access to Maths and Science content, self-tests with feedback, multilingual support and even school or province-based competitions. Linked to the Grade 8 to 12 school curricula for Maths and the completion, brings Maths and Physical Science concepts to life for learners through offline video lessons, Power-Point presentations and innovative software called GeoGebra – while also boosting their understanding through past papers, interactive self-tests and language support in several South African languages.

Until now, the app has only been available as a tablet or desktop-based "personal tutor" for learners in GMMDC project schools, and a laptop-based teaching resource for teachers.

To date, more than 7 000 Grade 10 to 12 learners at more than 100 project schools have received tablets (or school peer support (TAPS) programmes, and more than 1 500 teachers from 40 schools have received laptops through GMMDC's teacher development programmes.

GMMDC has also set up tablet- and desktop-based resource centres at most of the project schools – benefiting a further 10 000 learners.

Over the past three years, more than 50% of the ISP and TAPS learners at project schools in Nelson Mandela Bay and other Eastern Cape districts, have enrolled for university study programmes.

"Our aim now is to reach and support a much wider target group of teachers and learners via the new mobile app," said Olivier.

"A common thread through all our programmes has been our focus on harnessing accessible offline technology in a creative way to reach the new 'screen generation' of learners, who cannot imagine a world without TVs, mobile phones and computers."

"Teachers of Maths and Physical Sciences are in desperate need of modern teaching approaches to connect and address aspirations and the content gaps of learners in South Africa," Olivier said Friday's launch was also an opportunity to celebrate the "impact and maturation of the TouchTutor package after more than five years of research and development."

**30 tablets that have been loaded with everything a pupil needs for studying**

**There is a shortage of maths and science teachers**  
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## Competition to show maths art

**Tremaine van Aardt**  
 aardt@backstar.co.za

AN innovative concept aimed at kicking off the beauty of maths is being showcased this year when the Gova Mbeki Mathematics Development Centre launched its Math-Art Competition.

The competition aims to ignite interest in the perceived mundane maths module.

Speaking at the competition launch at Nelson Mandela University's Bird Street campus, centre director Professor Werner Olivier said the declining interest in mathematics among high school pupils, particularly in poorer areas, had prompted the competition idea.

The competition has two main categories – one linked to the grades 8 to 12 CAPS curriculum, where entrants have to use maths concepts taught at school to design art, and the other an open category, which includes any artwork with a link to maths.

The pilot competition will be advertised at more than 90 schools across six districts in the province.

However, it is open to all high school pupils, university students and undergraduate education students.

Entry forms are available at [mathartcompetition@gmail.com](mailto:mathartcompetition@gmail.com).

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Mimi Mini, Deputy Director of Teaching and Learning Resource Development at the National Department of Basic Education, chats to pupils playing an innovative coding game called "Tanks", at a STEAM (science, technology, engineering, art and maths) workshop run by Nelson Mandela University's Govan Mbeki Mathematics Development Centre (GMMDC). The DBE recently proposed Coding as a new South African school subject.

Pupils from disadvantaged schools across the Eastern Cape are taking their first steps towards IT careers, by getting a feel for coding theory.

Nelson Mandela University's Govan Mbeki Mathematics Development Centre (GMMDC) has included coding theory in its interactive STEAM (science, technology, engineering, art and maths) experiential-learning workshops, run in classrooms from East London to King William's Town, Queenstown, Bedford and Somerset East. The STEAM workshops are run in partnership with Capitec, Old Mutual, Cookhouse Windfarm Trust and BK Admin Services.

# Maths, science is now on the phone

Free Android app offers offline curriculum help

By GUGU PHANDE

SECONDARY school pupils unable to perform at their top level due to under-resourced schools will now have a chance to put their best academic foot forward with a ground-breaking maths and science mobile application.

The Nelson Mandela University's Govan Mbeki mathematics development centre (GMMDC) has been using cutting-edge technology to boost teaching and learning in maths and science to schools in need.

The app, TouchTutor® Quiz, is available for free on Google Play Store, offering teachers and pupils mobile access to maths and science academic content.

The app's curricula follow those of grades 8 to 12 on maths, and grades 10 to 12 for physical sciences.

There are high hopes that the app will boost the pass rate in these two key subjects.

"This app can be used by pupils, teachers and schools anywhere in South Africa," enthused GMMDC director Professor Werner Olivier.

"It builds on our existing programmes, which have already led to improved understanding and real results in the classroom."

"The new app will allow us to bring even more innovation into the classroom and help even more pupils, which we're really excited about."

TouchTutor® Quiz can be downloaded on Android phones and tablets, which can be linked to data projectors for teachers to use in class.

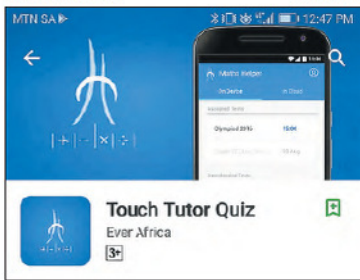
It is a spin-off of GMMDC's first app – the ground-breaking TouchTutor® package – which is an offline teaching and learning resource that covers the complete school curriculum.

This app, first introduced in 2012 and expanded each year until its 2017 completion, brings maths and physical science concepts to life for pupils through offline video lessons, PowerPoint presentations and innovative software called GeoGebra.

It also boosts understanding, memory and self-confidence through past papers, interactive



INVESTING IN THE FUTURE: Professor Werner Olivier, director of Nelson Mandela University's Govan Mbeki Mathematics Development Centre (GMMDC), is the driving force behind the new TouchTutor® Quiz app



self-tests and language support in several of South Africa's official languages.

In another project, GMMDC, working closely with Old Mutual, has developed an incubator school programme that offers hundreds of pupils across the province adequate maths and science learning material.

The cities involved include East London, Komani, Port Elizabeth and King William's Town.

East London project leader David Nzirawa says helping pupils reach their full potential is really inspiring. "We host classes at the Gampo Library every Saturday. Here, 100 Grade 11 and 12 pupils are taken through rigorous maths and science lessons using GM-

MDC's teaching programmes.

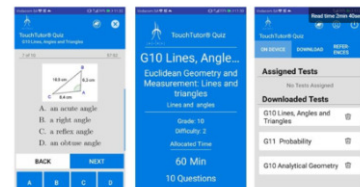
"These children are so receptive to information. They are willing to learn and make a change in their lives and that is truly inspiring," said Nzirawa.

GMMDC has provided the selected 100 pupils with tablets that they can take home so that they can study using the app.

The schools involved with GMMDC's East London incubator programme include Alphenhale Secondary School, Sinovuyo High School, Ebenezer Majombozi High School, Greenpoint High School, Khusile Comprehensive School, Mzokhanyo High School, Qaqamba High School and Lumko High School. — gugup@dispatch.co.za

TouchTutor Quiz gets a makeover

By KATHAR GOOL, Johannesburg, 04 May 2018



The updated TouchTutor Quiz app can be downloaded onto any mobile device. The Govan Mbeki Mathematics Development Centre (GMMDC) will today launch an updated version of its learning app, TouchTutor Quiz, a spinoff from the original TouchTutor app introduced in 2012. The updated app contains new features, including a range of reference material in maths and science, as well as online competitions and assessments. It also uses minimal data.

This is according to Phil Collett, mathematics project manager of the GMMDC at Nelson Mandela University (NMU).

"TouchTutor Quiz was developed by the GMMDC at NMU in collaboration with IT company AvoChoc, and was created with the desire to make learning material, language support, assessment and practise for maths and science freely available to all learners on their own mobile devices.

"It is primarily aimed at high school learners and teachers, but can cater for any subject at any level. Leading primary school content can be done, but may require partnership with interested teachers or schools."

"The app was previously only available on tablets and desktops for pupils in GMMDC project schools, with a laptop-based teaching resource for educators to make use of," notes GMMDC director Werner Olivier.

"The updated app can be used by pupils, teachers and schools anywhere in SA and builds on our existing programmes, which have led to improved understanding and real results in the classroom."

The user downloads the app and then registers on the platform, explains Collett. "The app then has options for practice tests; assigned tests which are scheduled for specific times and accessing reference material and language dictionaries in eight South African languages. The user's record of test performance and their profile are always visible."

"Users must be online to register and download tests, but may use downloaded material offline. Results are updated when the user is online again. All material is accessed by simply touching the options available. Question types include multiple choice, matching, sequencing, true or false, numerical and text answers."

Collett notes the app is primarily aimed at high school learners, but college and university students will find it useful as revision. The app can potentially be used by anyone who wants to implement assessment and access content for reference purposes.

In future, GMMDC plans to expand participation in its annual online maths and science competitions, says Collett. "We intend to add game elements to the app and host regular challenges. We will continually expand the range of questions and tests available. We also intend to offer a commercial service for customised assessment."

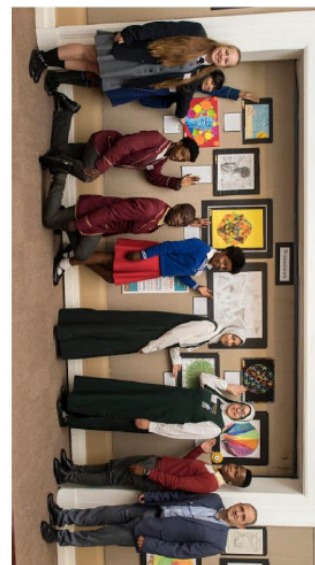
The updated TouchTutor Quiz can be downloaded from the Google Play store on any mobile device. A similar initiative aiming to remove barriers to learning is video education firm Paper Video, which gives learners access to teaching offline using their mobile devices without needing any Internet connection or data.



Left to right: Mr Dal Matta, Old Mutual; Mr Asemahle Ceza, for TAPS participant; Prof Werner Olivier, Director GMMDC; Dr Phil Collett, Project Leader GMMDC; Mr Erik Greeff, DBE

# Bay conference celebrates Math-Art winners

Competition prize-giving highlight of GeoGebra event



Showing Nelson Mandela University's Prof Werner Olivier, right, their innovative artworks, are the Eastern Cape winners of the first Math-Art competition, from left, Grens High's Mia Bethell, Bechochunt High's Shanyu Archery (Joh from East London), Urban Academy's Mandlile Khona, KwaNgqakazi High's Mzizisi Nhlisi, Get Ahead College's Zukhanyo Hlatshway (from Komani), Nasrudinzi Islamic High's Fatima Zahra Hoosain and Zaaribh Kenderany, as well as KwaNgqakazi High's Mashoke Mampuma.

It was a clean sweep for KwaNgqakazi High School at the weekend with two of its pupils taking the top spots in the Eastern Cape's first Math-Art competition where entrants had to create art pieces inspired by maths. The prize-giving for the Math-Art competition – which was run by Nelson Mandela University's Govan Mbeki Mathematics Development Centre (GMMDC) – was one of the highlights of the centre's fifth annual GeoGebra Conference for teachers and TVET College lecturers. This year's theme was "GeoGebra for STEAM Education: Linking Maths and Arts for Better Learning Design". GMMDC hosts one of 187 global institutes for GeoGebra, which is free, open-source maths software used in maths and science classrooms across the globe, while STEAM – the acronym for Science, Technology, Engineering, Art and Mathematics – follows an international education trend where science, technology and the arts are promoted through maths. The weekend conference included several talks, along with practical sessions, where teachers learnt how to include GeoGebra in their classrooms. The link between maths and the arts – found in nature, fashion, architecture, Islamic and African art – was also the driving force behind GMMDC's Math-Art competition, which drew 113 entries from 26 schools. These are on display at the Nelson Mandela Metropolitan Art Museum until June 8.

# Mobile maths competition draws 'screen generation' pupils

6 DECEMBER 2018 BY ALAN STRATON



The app prize in two mobile-based maths competitions – both run through the innovative TouchTutor Quiz app, developed by Nelson Mandela University's Govan Mbeki Mathematics Development Centre (GMMDC), was awarded to 11-year-old Mthuli Aiso from Grahamstown (Grade 7), Ntshonke Mkhumbane from Port Elizabeth (Grade 7), and Ntshonke Mkhumbane from Port Elizabeth (Grade 7). Other winners include Mthuli Aiso (Grade 7), Ntshonke Mkhumbane (Grade 7), and Ntshonke Mkhumbane (Grade 7). The winners were awarded certificates and prizes during a ceremony at the GMMDC.

The TouchTutor Quiz app – developed by Nelson Mandela University's Govan Mbeki Mathematics Development Centre (GMMDC) – is a free, open-source maths software used in maths and science classrooms across the globe, while STEAM – the acronym for Science, Technology, Engineering, Art and Mathematics – follows an international education trend where science, technology and the arts are promoted through maths.