



TANKS

Introduction to coding concepts

Email: jean.greyling@mandela.ac.za

Phone: 0835544183

Facebook: Games powered by Tangibi

Original Objective

To introduce learners to coding concepts without the need of computers, thus enticing them to consider software developer careers

South African reality



- Software development has been identified as one of the most sought-after skills in South Africa (and most of the world).
- Most learners have very little access to computers and thus awareness of computer programming.
- Government wants to introduce coding and robotics to all grades, starting at Grade R.
- 16000 out of the 25000 schools in the country do not have computer laboratories.

TANKS coding app

The TANKS coding app was developed as Byron Battersen's Honours project in the Department of Computing Sciences at the Nelson Mandela University in Port Elizabeth. It makes use of mobile devices and actual puzzle pieces.

TANKS rollout

Since 2018, the most effective way of rolling out TANKS, has been offering workshops to typically groups of not more than 40 learners, participating in teams of preferably 5-6 learners. Schools have also purchased TANKS School Kits which contain the following:

- 8 TANKS game sets
- 7 Lesson plans
- 11 Instructional videos
- Solutions for all 35 levels in the game

LEARN HOW TO CODE

FUN FOR ALL AGES

STEP 1

Observe the map. Note shootable and none shootable objects



STEP 2

Set up your chain of commands to the tank using your tokens



STEP 3

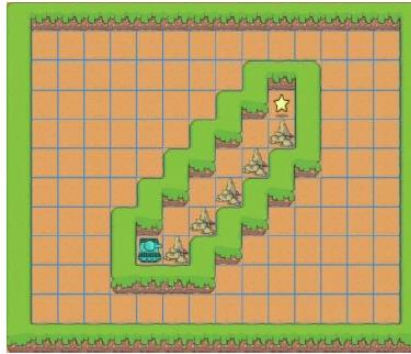
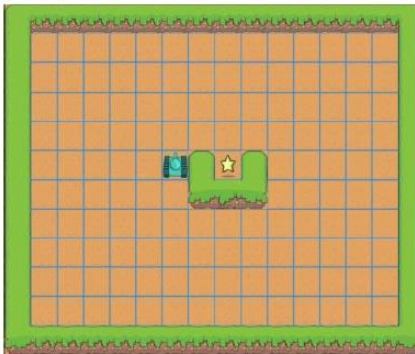
Capture and confirm your tokens then watch your tank go!



Coding concepts introduced by TANKS

The game consists of 35 levels, each setting a challenge to the player, with increasing complexity. The following basic programming concepts are introduced:

- Turtle graphics commands
- For loops
- While loops
- If statement



Furthermore, the following more advanced concepts can be shown:

- Repeating complex code in a loop
- Nested loops (for and/or while)
- Infinite loops that terminate at a point
- Using if statements in a for loop (and how that is actually similar to a while loop)
- Optimizing your code through different solutions

East Cape pupils excel in coding competition

Winners had limited instruction but got the gist immediately

XOLELWA DWESINI

xolelwad@pupils.co.za

Two pupils from the Eastern Cape reigned at this year's Tanks national computer hackathon competition in Johannesburg.

Mihlali Ngudle, in Grade 6 at Nokwanda Primary School and Lisakhanya Nukwa, in Grade 9 at Sixishe Secondary, took the number one spots in their respective grade categories, with Ngudle being the overall winner.

Both schools are in Ezibeleni in Komani.

The competition was open to pupils in grades 5 and 6 and those in grades 8 and 9.

The hackathon sees competitors being given a problem to solve using a computer programme. The adjudicators watch and mark them accordingly. One hundred pupils from five provinces spent hours coding. The schoolchildren were all from remote and disadvantaged schools with little formal training in coding.

Mihlali said: "I was not sure if I was going to win but I was confident. Winning it made me feel good about myself."

The 12-year-old said the only training she received was from Professor Jean Greyling from Nelson Mandela University



QUICK LEARNERS: Mihlali Ngudle and Lisakhanya Nukwa won the Sita hackathon computer coding competition. Picture SUPPLIED

which led to an interest in computer coding.

Lisakhanya said: "I am happy that this programme came to our area. We are a rural area and we do not get opportunities such as these."

"It was a great experience."

Nokwanda Primary principal Funeka Rozani said she was over the moon with Mihlali's achievement.

"The children were not taught how to computer code. They had one session before they went to play in Johannesburg with Professor Greyling and they grasped it immediately."

The Eastern Cape was represented by four schools – Nokwanda Primary, Sixishe Secondary, Greenpoint High from East London and pupils from

the Artombo art project in Port Elizabeth.

The competition is sponsored by the State Information Technology Agency (Sita).

The co-ordinator of the Sita Tanks Hackathon, Professor Greyling, said they had reached 2,500 pupils from remote and disadvantaged schools.

Sita CEO Dr Setumo Mohapi's said: "Sita will continue to cre-

ate the kind of development we envisage as outlined in the NDP."

"This hackathon has been particularly exciting as Sita ensured that South African learners are exposed to the possibilities of being solution developers and designers."

The winners share a R5,000 cash prize for their schools and other individual prizes.

Main events in 2018

- SITA sponsored workshops reaching 700 learners in 5 provinces, culminating in 100 learners participating in the finals at the Sandton Convention Centre.
- BKB sponsored workshops during National Science Week, at the Mandela School of Technology in Mvezo where 400 learners were reached.



26 April 2018

Westering High becomes the first school to incorporate TANKS into their Grade 9 lessons. Their IT teacher Amy Jacobus reports: "Our first sessions went very well. I noticed that quite a few of them battle with perspective and direction but it improved with each level. They didn't want to go to their next lesson."

- STEAM (Science, Technology, Engineering, Art, Mathematics) workshops across the Eastern Cape presented by the Govan Mbeki Maths Development Centre at Nelson Mandela University



25 October 2018

Mimi Mini, Deputy Director of Teaching and Learning Resource Development at the National Department of Basic Education, chats to pupils playing our innovative coding game called “BOATS”, 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.

(The Maths Centre is using TANKS and BOATS throughout the Eastern Cape)

Main events in 2019

- First (successful) trial run of TANKS lesson plans, Hudson Park Primary School, East London
- TANKS receives “Highly Commended Certificate of Excellence” as runner up for Technology Innovation of the Year at Africa Tech Week
- TANKS shares the stage with 65 globally selected projects at UNESCO’s Mobile Learning Week in Paris, France - the UN’s flagship education conference of the year, focussing on education for disadvantaged communities.
- Prof Jean Greyling awarded IT Personality of the Year by Eastern Cape Chapter of Institute of IT Professionals SA.
- Prof Jean Greyling a national finalist as IT Personality of the Year by Institute of IT Professionals SA.
- 250 learners from 25 schools participate in a coding tournament on Mandela Day
- Nelson Mandela University Innovation Excellence Award.
- Top 10 in SAB Foundation Social Innovation Awards
- Reached 11000 learners in Mandela Bay with coding workshops during October

● Innovation recognised with invitation to prestigious event in France

Bay man’s educational app set for UN showcase

Main events in 2020

- Invited as plenary speaker at UNESCO’s Mobile Learning Week in Paris
- Present 2 virtual coding tournaments during COVID-19 lockdown with 100’s of learners from across the country and Namibia participating



“This game TANKS is amazing!” Lebohang Ngake Prince, Botshabelo, Free State.



“No Mam, you must then turn right and use the repeat loop.”
Kids educating their teachers.