

NATIONAL SCIENCE WEEK

BRINGING SCIENCE, TECHNOLOGY AND INNOVATION TO LIFE



DEEPENING OUR DEMOCRACY THROUGH SCIENCE



science
& technology

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA



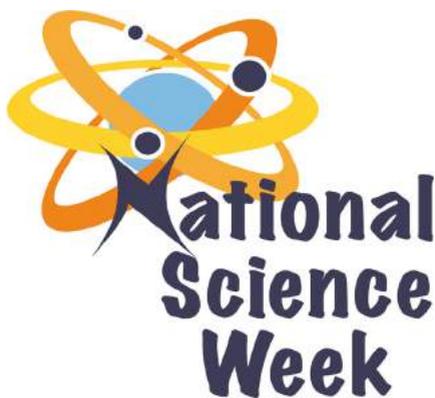
SAASTA
South African Agency for Science
and Technology Advancement

CONTENTS

WHAT'S NATIONAL SCIENCE WEEK?	I
ABOUT THE PICTURE BOOKLET	II
OVERVIEW OF NATIONAL SCIENCE WEEK 2018	1
DEEPENING OUR DEMOCRACY THROUGH SCIENCE	2
PRE-LAUNCH ACTIVITIES	3
THE NATIONAL LAUNCH EVENT	5
WHAT HAPPENED DURING THE FOCUS WEEK?	10
ENJOYABLE SCIENCE	27
ACRONYMS	30

WHAT IS NATIONAL SCIENCE WEEK?

The National Science Week (NSW) is an annual countrywide celebration of science, technology, engineering, mathematics and innovation (STEMI) led by the Department of Science and Technology (DST). Various stakeholders, role players and interest groups collectively conduct activities that promote general awareness of the value of STEMI. The NSW takes place annually under the Science Engagement Strategy (2015) which seeks to popularise science and raise public awareness of the role of science in daily life, as well as making science appealing as a career choice to young people.



ABOUT THIS PICTURE BOOKLET

The picture booklet provides memories and experiences of the National Science Week activities. The booklet tells the story of the people, places and scientific topics that were featured during National Science Week. It aims to highlight some of the captivating science being carried out in South Africa and its relevance to our everyday lives. Some of the pictures have interesting and eye-catching captions accompanied by short but powerful text describing the scenes.



OVERVIEW OF NSW 2018

The National Science Week focus week took place from 30 July to 4 August 2018 in over 140 sites simultaneously in all the nine provinces of South Africa. Each year a different theme is chosen and activities are offered around these themes to the participants. The theme for 2018 was *"Deepening our democracy through science"*. During the 2018 focus week, 81 grant holders including science councils, science centres, universities, national research facilities, museums, and independent organisations engaged the public in a variety of science engagement activities across the country. The national launch took place on 28 July 2018 and was preceded by various pre-launch activities.



"I am taking this information back to my school and community to help them understand how important science is. It will not be easy, but I will make a difference. National Science Week rocks!"
- A comment from a Grade 10 learner at the Maths and Science Leadership Academy.

SCIENCE WEEK HIGHLIGHT

NSW 2018 took place at over 140 sites in all nine provinces and was implemented by over 80 grant holders.

DEEPENING OUR DEMOCRACY THROUGH SCIENCE



IN LINE WITH THE 2018 THEME, “DEEPENING OUR DEMOCRACY THROUGH SCIENCE”, THE ALBERTINA SISULU BANNER WAS DISPLAYED HIGH UP IN THE NSW 2018 LAUNCH VENUE IN CELEBRATION OF HER CENTENARY AND LEGACY AS A WOMAN OF FORTITUDE.

In 2018, South Africa’s father of democracy, President Nelson Mandela, would have turned 100 years old and National Science Week commemorated this occasion by looking at how scientific knowledge and progress can lead to a deepening of our democracy. A democracy is strengthened through a process of testing, sampling, counting and critical thinking, which are skills required in scientific endeavours. Science is the rigorous search for facts. It involves critical thinking and creativity. By having the ability to compare and test information for its legitimacy, our democracy is strengthened. There is also an element of imagination in science - scientists need to use their imagination to create a valid hypothesis and to design ways to test it. For democracy, we must imagine the future we want, in order to reach it.

PRE-LAUNCH ACTIVITIES

Pre-launch activities aim to broaden the impact of National Science Week by ensuring that activities are not only limited to the main focus week. It provides opportunities for more South Africans to get in on the science week action. With the intention to make pre-launches a standard practice going forward since the first pre-launch in 2017, a number of pre-launch activities were carried out in 2018 in Mpumalanga as the host province for the NSW 2018 launch. Interestingly, the University of Mpumalanga in Nelspruit is a fairly new university established in 2014 and is fast developing to become an exceptional institution of higher learning. The pre-launch activities also extended to the Eastern Cape where the Nelson Mandela University led an interactive programme of activities.



YOUNG AND ASPIRANT SCIENTISTS VISITED THE NELSON MANDELA UNIVERSITY FOR THE NSW PRE-LAUNCH EVENT AND MET ESTABLISHED RESEARCHERS WHO ENCOURAGED THE YOUNG SCHOOL LEARNERS TO GET INVOLVED SCIENCE, TECHNOLOGY ENGINEERING AND MATHEMATICS FIELDS. IT WAS MADE CLEAR THAT SCIENCE IS FOR EVERYONE; BOYS, GIRLS, YOUNG AND OLD.

PRE-LAUNCH ACTIVITIES



THE PRE-LAUNCH ACTIVITIES AT THE NELSON MANDELA UNIVERSITY SAW LEARNERS ENTER LABORATORIES TO EXPLORE THE WONDERS OF SCIENCE THROUGH CONDUCTING HANDS-ON EXPERIMENTS WITH LOCAL SCIENTISTS. LEARNERS GOT TO MEET SCIENTISTS AND SAFELY CONDUCT SCIENCE EXPERIMENTS WITH THEM.

DID YOU KNOW?

Safety is essential in the lab, so always wear the correct safety equipment and ensure that you follow necessary lab safety procedures

THE NATIONAL LAUNCH EVENT



THE HONOURABLE MMAMOLOKO KUBAYI-NGUBANE, MINISTER OF SCIENCE AND TECHNOLOGY, OFFICIALLY OPENING THE NATIONAL SCIENCE WEEK FESTIVITIES AND ADDRESSING THE AUDIENCE.

The National Science Week was launched by the honourable Minister of Science and Technology, Ms Mmamoloko Kubayi-Ngubane, on 28 July 2018 at the University of Mpumalanga in Nelspruit. During her address, Minister Kubayi-Ngubane encouraged learners and members of the general public to read about and try to identify the role that each have to play in the fourth industrial revolution; to choose careers that will have an impact on their lives, as well as in their communities and the overall economy of the country

THE NATIONAL LAUNCH EVENT



LEARNERS FROM AROUND MPUMALANGA GATHERED TO EXPERIENCE THE LAUNCH OF NATIONAL SCIENCE WEEK AND ATTEND THE OPENING ADDRESS BY THE MINISTER OF SCIENCE AND TECHNOLOGY.



SOARING IN THE SUNNY BLUE SKY ABOVE THE UNIVERSITY OF MPUMALANGA WAS THE NATIONAL SCIENCE WEEK BLIMP, WHICH SIGNALLED THE LAUNCH OF NSW 2018.

DID YOU KNOW?

Helium is the second lightest gas and is used in party balloons and in the NSW 2018 blimp. This non-toxic, low density gas is also used in industrial leak detection, Helium-neon lasers and as a heat-transfer medium in some nuclear reactors.

THE NATIONAL LAUNCH EVENT



A LEARNER CHECKS THE DAY'S PROGRAMME DURING THE LAUNCH ADDRESS.



AS THE MINISTER SHARED ENCOURAGING WORDS DURING HER OPENING ADDRESS, SOME LEARNERS DILIGENTLY TOOK NOTES TO CAPTURE THE MINISTER'S INSPIRING WORDS ABOUT HOW THEY SHOULD INVEST IN THEIR EDUCATION.



THE MINISTER AND ACTING PREMIER TOOK TO THE EXHIBITION STANDS TO ENGAGE WITH THE DELEGATES FROM VARIOUS INSTITUTIONS WHICH SHOWCASED THE LEVELS OF INNOVATION THAT ARE BEING UNDERTAKEN IN THE SCIENCE AND TECHNOLOGY FIELDS.

THE NATIONAL LAUNCH EVENT



**THE NSW 2018 LAUNCH
SAW THOUSANDS OF VISITORS MEET SCIENTISTS
AND RESEARCHERS FROM ACROSS THE COUNTRY.**

THE NATIONAL LAUNCH EVENT



LEARNERS LINE UP TO RECEIVE THEIR LUNCH PACKS DURING THE NSW 2018 LAUNCH



VISITORS TO THE NSW 2018 LAUNCH LEARNT ABOUT ROBOTICS, BIODIVERSITY, SPACE SCIENCE AND MANY OTHER STEMI FIELDS



WHAT HAPPENED DURING THE FOCUS WEEK?

During the 2018 focus week, 81 grant holders that included national research facilities, science councils, science centres, universities, museums, and independent organisations engaged the public in science awareness activities across the country. Underpinned by the theme: *"Deepening our democracy through science"*, the focus week showcased a wide range of STEM activities. Some of the activities included industry visits, scientific content-focused workshops, interactive research activities, and exhibitions, among others.



A LEARNER GETS INVOLVED IN THE NATIONAL SCIENCE WEEK FOCUS WEEK AND HOLDS A BUBBLE OF CARBON DIOXIDE IN HER HAND AS SHE DISCOVERS THE WONDERS OF SCIENCE.

WHAT HAPPENED DURING THE FOCUS WEEK?

INTERACTIVE EXHIBITIONS



The Focus Week activities saw a lot of teamwork taking place as learners worked together to solve puzzles and riddles, testing their knowledge while learning collaboration and sharing skills in fun and exciting ways. These are skills that are vital for researchers in any science field. Almost every research project requires catalysing collaborative efforts that bring together researchers with diverse scientific backgrounds and perspectives to address perplexing questions and solve complex problems that benefit from an interdisciplinary or multidisciplinary approach.



WHAT HAPPENED DURING THE FOCUS WEEK?

INTERACTIVE EXHIBITIONS



National Science Week ensures that South Africans of all ages can interact with science and strives to develop enquiring minds from a young age. Early Childhood Development is being prioritised by the South African government as it is viewed as a critical aspect of our nation's success in the future.

WHAT HAPPENED DURING THE FOCUS WEEK?

INTERACTIVE EXHIBITIONS

DID YOU KNOW?

The **sounds** that we hear are caused by vibrations and these move through the air as a pressure wave. When these vibrations reach your ear, they vibrate your eardrum and you are able to hear the sound. The speed of sound in air is approximately 343 meters per second (at 20°C).



INTERACTIVE SCIENCE EXHIBITIONS ENABLE THE PUBLIC TO ENGAGE WITH SCIENCE AND HAVE CONVERSATIONS WITH SCIENCE COMMUNICATORS.



WHAT HAPPENED DURING THE FOCUS WEEK?

National Science Week brings science into public spaces such as shopping malls, parking lots, taxi ranks and sports tournaments.

SCIENCE IN THE MALL

SCIENCE WEEK HIGHLIGHT

Learners, educators, the broader public, policy makers, researchers, are just some of the people who get involved in science week activities.



WHAT HAPPENED DURING THE FOCUS WEEK?



Mobile science laboratories ensure that National Science Week activities are not confined to the four walls of a laboratory building or classroom. The mobile science laboratories enable science to take a road trip and reach even the most remote and rural communities.



WHAT HAPPENED DURING THE FOCUS WEEK?

SCIENCE DEMONSTRATIONS

DID YOU KNOW?

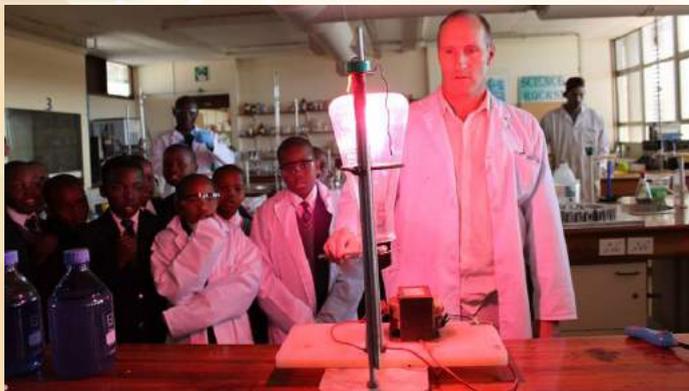
Dry ice, the stuff that is often used to keep your ice-cream cold, is actually frozen **carbon dioxide**. Interestingly, unlike water, the solid dry ice doesn't first become a liquid at room temperature but turns directly to a gas at 78.5°C .



WHAT HAPPENED DURING THE FOCUS WEEK?

SCIENCE DEMONSTRATIONS

Science demonstrations can create a sense of awe about science and deepen the audience's understanding about STEM topics.



DID YOU KNOW?

Reactions, like this one, that produce heat and light are quite common in everyday life and are called **exothermic reactions**.

You'll find these reactions in car engines, gas stoves, braai's, electricity power plants and even in your body.



WHAT HAPPENED DURING THE FOCUS WEEK?



Complete focus as a child prepares to launch a compressed air rocket

A learner takes a look beyond the realm of ordinary human vision and into a micro world, as he peers through a compound light microscope



An electric moment as a learner makes a battery by inserting copper and zinc electrodes into a potato.

A group of learners touch a plasma ball and observe the ionised gas



WHAT HAPPENED DURING THE FOCUS WEEK?

HANDS-ON SCIENCE

CAREER FOCUS

A Medical Laboratory Technologist conducts tests and experiments to provide information to doctors. Their work entails using high tech equipment, conducting experiments, analysing samples, consulting with doctors and writing reports.



LEARNERS AT NELSON MANDELA UNIVERSITY STAY FOCUSED AS THEY EXPERIMENT AND LEARN ABOUT SCIENCE.

WHAT HAPPENED DURING THE FOCUS WEEK?

HANDS-ON SCIENCE

Learners in the Western Cape visit the newly revamped West Coast Fossil Park for a hands-on science workshop. The workshop facilitator leads them in a process of discovery as they identify bone fragments from owl droppings.



WHAT HAPPENED DURING THE FOCUS WEEK?

VIRTUAL REALITY

DID YOU KNOW?

Virtual reality (VR) enables you to enter a simulated environment and it can include both auditory (hearing) and visual (seeing) experiences. VR can be used to simulate real workplace scenarios for astronauts, miners, pilots, deep sea divers and astronomers.



A NATIONAL SCIENCE WEEK VISITOR EXPERIENCES WHAT IT IS LIKE TO TAKE A TOUR OF THE SQUARE KILOMETRE ARRAY TELESCOPE IN THE NORTHERN CAPE THROUGH A VIRTUAL REALITY EXPERIENCE

WHAT HAPPENED DURING THE FOCUS WEEK?

BIOLOGY AND BIODIVERSITY



LEARNERS ARE TAKEN ON FIELD TRIPS INTO THE OUTDOORS TO LEARN ABOUT BIODIVERSITY AND HERE THEY HEAR ABOUT PLANTS WITH MEDICINAL PROPERTIES.



LEARNERS ALSO GET A FIRST HAND EXPERIENCE OF IN-DIGENOUS ANIMALS, INCLUDING THIS PYTHON, AND LEARN ABOUT THE NEED TO CONSERVE OUR NATURAL HERITAGE.



LEARNERS ALSO DO SPECIES DIVERSITY SAMPLING EXERCISES AND OBSERVE ORGAN DISSECTIONS TO LEARN MORE ABOUT BIOLOGICAL SYSTEMS.



WHAT HAPPENED DURING THE FOCUS WEEK?

PALAEONTOLOGY



A FIELD GUIDE AT THE WEST COAST FOSSIL PARK TAKES LEARNERS TO THE SITE OF AN ACTUAL FOSSIL DISCOVERY. THE SITE IS THOUGHT TO DATE TO AROUND 5 MILLION YEARS AGO DURING THE LATE MIOCENE, EARLY PLIOCENE TRANSITION.



LEARNERS ENTER THE WORLD OF PALAEONTOLOGY AT THE WEST COAST FOSSIL PARK AND LEARN ABOUT THE DEVELOPMENT AND INCREDIBLE RADIATION OF LIFE ON EARTH.

CAREER FOCUS

A **palaeontologist** is a scientist who studies the history of life on earth. Their work entails reconstructing fossil remains, laboratory work, writing scientific papers, fieldwork and teaching.

WHAT HAPPENED DURING THE FOCUS WEEK?

ROLE MODELING



National Science Week creates platforms where scientists can meet with learners and inspire them. These role models are important motivators for learners to pursue careers in STEM. Here a scientist at iThemba LABS in the Western Cape acts a role model.



CAREER FOCUS

A **software developer** is responsible for developing programmes and applications. Their work entails logical problem solving, data management, mathematics and using computer software.

**WHAT HAPPENED
DURING THE FOCUS WEEK?**

**CORNET M FOUNDATION
AND REDFEST PRESENTS
THE SCIENCE OF INDIGENOUS
GAMES DURING:
2018 NATIONAL
SCIENCE WEEK**



DATES & VENUES

TUESDAY 31 JULY 2018, MODIMOLLE,
@LEKKERBREEK LAERSKOOI, 09H00 - 14H00
WEDNESDAY 01 AUGUST 2018, GA-MOLEPO
VILLAGE, @CORNET M FOUNDATION LIBRARY, 11H00 - 17H00
FRIDAY 03 AUGUST 2018, MAMELODI, @CATANG COMPREHENSIVE
SCHOOL, 09H00 - 12H00




SKEEM SAAM ACTOR, CORNET MAMABOLO, HELPS DEMONSTRATE THAT SCIENCE CAN BE ENJOYABLE AND SERVES AS A ROLE MODEL TO LEARNERS IN GAUTENG.



HERE AN AUDIENCE OF BOTH YOUTH AND ADULTS ATTEND A ROLE MODELLING SESSION AND A SCIENCE TALK TO HEAR MORE ABOUT WHAT SOUTH AFRICAN SCIENTISTS ARE UP TO.



WHAT HAPPENED DURING THE FOCUS WEEK?

PUBLIC SCIENCE TALKS AND RESOURCES



A PRESENTER DELIVER A SCIENCE TALK ABOUT CHEMICAL REACTIONS AND HOW THE FIELD OF CHEMISTRY HAS DEVELOPED OVER TIME

CAREER FOCUS

A **Chemical Engineer** solves problems by using chemistry and engineering principles. Their work entails researching new chemical processes, designing new products, complying to safety regulations, monitoring production and planning chemical plants.



NSW 2018 SAW THE DISTRIBUTION OF THOUSANDS OF STEMI RESOURCES TO LEARNERS AND THE BROADER PUBLIC INFORMING THEM ABOUT INTERESTING LOCAL SCIENCE.

ENJOYABLE SCIENCE

Attempts to bridge the gap between people and science include demonstrating that science can be enjoyable and exciting. On the other hand, the National Development Plan (NDP) identified recreation and leisure among capabilities that individuals need to live lives that they desire. This section looks at the contribution of science to recreation and it shows that science can also have lighter moments.



DID YOU KNOW?

When a spinning ice-skater pulls their arms in, they will spin faster due to the **conservation of angular momentum**. This is also the reason why a short pendulum will always swing with a faster interval than a longer one. Angular momentum is used everyday in clocks, flywheels in machinery and spinning tops.

ENJOYABLE SCIENCE

DID YOU KNOW?

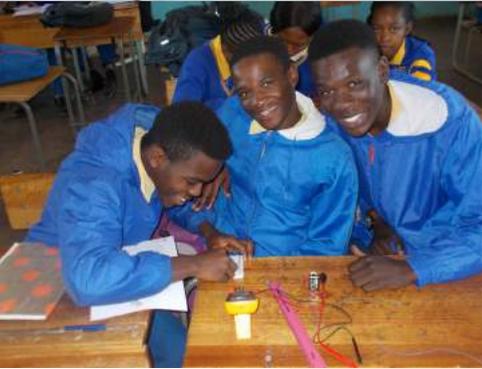
A **reflection** is caused by light bouncing off an object. The angle that the light hits an object (angle of incidence) will always equal the angle that it bounces off (angle of reflection) This principle is used in optic fibres, solar cookers and cameras.



WATCHING A BALL TWIRL INTO A SPIRAL WHICH SIMULATES A BLACK HOLE BRINGS A SMILE TO A GROUP OF FRIENDS.



A GROUP OF LEARNERS ENJOY LEARNING ABOUT THE PHASES OF MATTER AND SEEING A CLOUD OF CONDENSED WATER FILL THE ROOM.



ENJOYABLE SCIENCE



LEARNERS VISITING A LOCAL SCIENCE CENTRE ARE INTRODUCED TO THE FRIENDLY SCIENCE INTERPRETER.



WITH SOME EXPERIMENTS GIVING A RUSH OF ADRENALINE, LEARNERS SMILE IN AWE AND AMAZEMENT AT INNOVATION AND THEY EXPERIENCE HOW FUN SCIENCE CAN BE FOR EVERYONE.

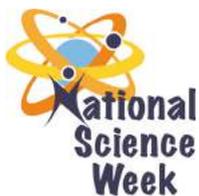
ACRONYMS

DEPARTMENT OF SCIENCE AND TECHNOLOGY	DST
NATIONAL DEVELOPMENT PLAN	NDP
NATIONAL RESEARCH FOUNDATION	NRF
NATIONAL SCIENCE WEEK	NSW
SCIENCE ENGAGEMENT STRATEGY	SES
SCIENCE, TECHNOLOGY, ENGINEERING, MATHEMATICS AND INNOVATION	STEMI
SOUTH AFRICAN AGENCY FOR SCIENCE AND TECHNOLOGY ADVANCEMENT	SAASTA
SQUARE KILOMETRE ARRAY	SKA



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