

NATIONAL SCIENCE WEEK 2022: IMPLEMENTATION PLAN

THEME:

“Celebrating the role of basic sciences in the modern world”



science & innovation

Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA



SAASTA
South African Agency for Science
and Technology Advancement

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ABBREVIATIONS

4IR	Fourth Industrial Revolution
5G	Fifth generation technology
AI	Artificial Intelligence
ASSAf	Academy of Science of South Africa
CHPC	Centre for High Performance Computing
COVID-19	Coronavirus disease
CSIR	Council for Scientific and Industrial Research
DSI	Department of Science and Innovation
ICT	information and communications technologies
IKS	Indigenous Knowledge System
IYBSSD	International Year of Basic Sciences for Sustainable Development
MUT	Mangosuthu University of Technology
NSW	National Science Week
NYS	National Youth Service
PDOE	Provincial Department of Education
SAASTA	South African Agency for Science and Technology Advancement
SACE	South African Council for Educators
SACNASP	South African Council for Natural Scientific Professions
SDG	Sustainable Development Goals
SES	Science Engagement Strategy
STEM	science, technology, engineering and mathematics
STEMI	science, technology, engineering, mathematics and innovation
STI	science, technology and innovation
StatsSA	Statistics South Africa
TUT	Tshwane University of Technology
UK	United Kingdom
UN	United Nations
UNGA	United Nations General Assembly
WHO	World Health Organisation

1 INTRODUCTION

1.1 Policy and strategic perspective

The adoption of the 2019 White Paper on Science, Technology and Innovation (STI), which advocates the development of a science-aware and science-literate society, is an opportunity to consolidate and deepen the 20 years old science engagement programme led by the Department of Science and Innovation (DSI). These endeavours are guided by the Science Engagement Strategy (SES, 2015). The Strategy responds to the White Paper by creating an enabling environment to build a society that is knowledgeable about science, able to form independent opinions on science issues and scientifically literate. Such an attempt is realised through the implementation of a variety of interventions that are well orchestrated to:

- (a) popularise science, engineering, technology and innovation as attractive, relevant and accessible in order to enhance scientific literacy and awaken interest in relevant careers;
- (b) develop a critical public that actively engages and participates in the national discourse of science and technology to the benefit of society;
- (c) promote science communication that will enhance science engagement in South Africa; and
- (d) profile South African science and science achievements domestically and internationally, demonstrating their contribution to national development and global science, thereby enhancing their public standing.

1.2 Purpose of this document

The purpose of this document is to provide a detailed plan of the implementation of the National Science Week (NSW) on the 1 to 6 August 2022.

1.3 About the NSW 2022

The NSW is a DSI led project for the nation to celebrate science, technology, engineering, mathematics and innovation (STEMI) annually, where various stakeholders, role players and

interest groups collectively conduct activities that promote general awareness of the value of STEMI to people's daily lives.

1.3.1 Proposed NSW 2022 Theme

“Celebrating the role of basic sciences in the modern world”

The theme set a stage for a conversation about the importance of basic sciences in the development of complex scientific methods for human civilisation. The space occupied by basic science in tackling life-threatening natural phenomenon and disasters for the public good. These aim to increase awareness amongst the different sectors of society, policymakers and decision-makers of science for sustainable future. Basic sciences in combatting pandemics (e.g. COVID-19), hunger, climate change, crime and improve life expectancy and its quality, have been widely applied as the building blocks of the complex solution the human race has ever experienced. The contribution of STI will be discussed and demonstrated through different activities.

The celebration of NSW 2022 will also recognise the resolution adopted by the 76th session of the United Nations General Assembly on the 2nd December 2021. “*The International Year of Basic Sciences for Sustainable Development (IYBSSD)*”. IYBSSD appreciates that the applications of basic sciences are vital for advances in medicine, industry, agriculture, water resources, energy planning, environment, communications and culture, and that basic sciences rupture technologies respond to the needs of humankind by providing access to information and increasing societal well-being, and promoting peace through improved collaboration toward Sustainable Development Goals (SDGs).

1.3.2 Topics to inform the activities

DSI consulted some of the institutions that deal with basic sciences to get their views on the formulation of the topics to be covered. Table 1 summarises the proposed topics to be used in the development of NSW activities.

Table 1: NSW topics and the associated delivery methods

TOPIC	DESCRIPTION
The public value of basic science during the pandemic in a digital era	<ul style="list-style-type: none"> - Reflection of the vital role played by science during COVID-19 and other pandemics - Exploring the digital world in the advancement of lives such as: <ul style="list-style-type: none"> o <i>medical, communication, transport, agriculture, industrialisation, research, social life, teaching and learning (education), government services (service delivery)</i>
The lessons and unknowns after two years with COVID-19	<p>Having dealt with COVID-19 for over two years now:</p> <ul style="list-style-type: none"> - Lessons learned since the beginning of the pandemic - The key things we still don't understand.
Basic Sciences for Sustainable Development	<p>Open call for every sector of society to express themselves on the importance of basic sciences in their trade:</p> <ul style="list-style-type: none"> - Awareness of the critical function of basic sciences needs to be built amongst relevant stakeholders including policy-makers, business and industry, foundations, education, media, and the broader public. - Linking school science with real life application. - Individuals (experts and ordinary citizens) can share their stories / experiences about the basic sciences on social platforms. - Physics in my village
A perspective on how scholars perceive attitudes to science in policymaking in South Africa.	<p>Stellenbosch University, SACNASP and ASSAf to develop this discussion through webinars.</p> <p><i>(Molly Czachur; S. Afr. j. sci. vol.117 n.1-2 Pretoria Jan./Feb. 2021)</i></p>
Science promotion digital and film (featuring the four projects)	Key discoveries in basic sciences that have changed the world over the past 100 years
	Virtual exhibitions
	Role modelling
Teachers development on methods to teach Mathematics and Science (workshops)	Workshops for teacher across the provinces – equipping them with skills on teaching Maths and Science subjects as the foundation and gateway subjects. Training must be accredited with SACE.
Coding in Schools	<ul style="list-style-type: none"> - Computer Hardware and Coding workshops in the provinces by the CHPC (CSIR) - Other institutions like TUT and Unisa ISET will focus on mass awareness on robotics
Can South Africa be considered influential in science, technology and innovation	<ul style="list-style-type: none"> - Looking into some of the local inventions and discoveries, as well as the scientific areas in which South Africa has geographic or knowledge advantage.

TOPIC	DESCRIPTION
Science, misinformation and digital technology during the pandemic, war and revolution	<ul style="list-style-type: none"> - The way in which media can be used as an educational tool
How technology is changing the world during and after COVID-19	<ul style="list-style-type: none"> - How private companies and public institutions are changing their operations to survive the effects of COVID-19
Sustainable technological development through curiosity-driven basic science	<ul style="list-style-type: none"> - People feature how their basic research is contributing to technological development either today or will do so in future - Key discoveries in basic sciences that have changed the world over the last 100 years - How careers in basic sciences are impacting development, i.e. attracting learners to basic sciences not only applied sciences. - The importance of basic sciences in schools, sustainable development, global challenges, a digital world, technological advancement
Advancing basic sciences	<ul style="list-style-type: none"> - Strengthening Resilience with Basic Science in Uncertain Times/ Basic science for social justice - Best ways to advance basic science digitally - The pandemic as an accelerator of innovation in the digital era. - The pandemic in the digital era - the birth/dawn of disruptive innovation.

1.3.3 Detailed summary of the NSW 2022 edition

Table 2: NSW 2022 in brief

THEME	THE PUBLIC VALUE OF BASIC SCIENCE DURING THE PANDEMIC IN A DIGITAL ERA
Delivery model	<ul style="list-style-type: none"> Webinars, documentaries, recorded and live exhibitions and demonstrations, and physical activities
Objectives	<ul style="list-style-type: none"> illustrate the role of science in tackling problems and challenges encountered in creating and sustaining a prosperous society; demystify the myths surrounding some of the innovations that are important to the advancement of society; display that South Africa is a home of some discoveries and innovations that influence the world; and raise science, technology, engineering and mathematics (STEM) career awareness.
Dates	1 – 6 August 2022
Venues	<ul style="list-style-type: none"> Online platforms – virtual activities Strategically selected sites – physical activities
National Launch Event	30 July 2022 at the Mangosuthu University of Technology (MUT), Kwa-Zulu Natal

2 IMPLEMENTATION STRATEGY

After two years of pandemic wherein the world was trying to find a new normal to live with the corona virus (COVID-19) in trying to balance the livelihood and life, it seems as though things are starting to get back to normal. But this time the normal is shaped around the experience of the past two years so that in everything people plan to do, this co-existence with COVID-19 is already factored in. In 2021, NSW took place virtually. This was a way to respond to the challenges brought forth by COVID-19 regulations which include restrictions for big gatherings which tend to be the nature of the science week celebrations. Although challenging, the digital platforms presented new opportunities to present science engagement by deepening the scientific and technological consciousness to the public.

The use of technology to access NSW webinars and documentaries also improved scientific literacy of the society. As the world is slowly returning to the new normal which allows some limited gatherings, it provides an opportunity for NSW 2022 to

adopt a hybrid approach. A hybrid approach will combine elements of a blended physical, virtual and media content dissemination methods into a unified experience. The NSW 2022 blended approach will maximise access and participation by the citizens because it caters for the needs of different sectors of the society. Having successfully handled all elements of hybrid approach at different times in the past; i.e. face-to-face and mainstream media since NSW inception until 2019, and all virtual / online with both mainstream and social media in 2021, it is now the time to put them together in 2022 as hybrid. Taking these and related developments into consideration, this document presents a hybrid plan for NSW 2022.

2.1 Implementation Approach

The NSW 2022 will take a hybrid approach through information and communications technologies (ICT), media and face-to-face in strategic locations. In 2021 it was evident that South Africans are ready to exploit the convenience brought by digital platform to participate in different events. Just recently, the Statistics South Africa (StatsSA) has just concluded the hybrid census where a multiple-methods approach including telephone interviews, online and fieldworker visits were used for data collection. The advantage of this type of approach is to give a live and reliable data excellent for necessary interventions and on time at a specific location. Likewise, NSW 2022 will combine a number of methods customised to different sectors of society to maximise their participation. This will further ensure that the content is directed to the relevant groups of society.

Table 3: Hybrid model

METHOD	VENUES	ACTIVITIES	RESPONSIBILITY
Face-to-face (physical)	Schools	at least 1000 schools - NSW plan (dates and activities) to be sent to PDOEs - Lists of schools verified with each Province - Material distribution plan completed by 31 March 2022 - Data collection instrument developed and approved	Science clubs at schools to lead the activities internally and / or for the local communities
	In- and Outreach / public spaces <i>Social media:</i>	- District mapping model points out the exact locations of the existing facilities and the strategic locations to be targeted for outreach activities (see Annexure A).	Grant holders to be recommended for in-reach or outreach to specific locations

	<i>YouTube, Facebook, Tweeter</i>	- Mobile facilities from grant holders to be deployed strategically for in-person	informed by the mapping
ICT	Online channels: <i>Zoom, MS Teams,</i> <i>Social media: YouTube, Facebook, Tweeter</i>	Live and recorded online activities: - Webinars - Documentaries - Exhibitions Programmes with all the links to concluded by 15 July 2022 Testing of the system by 20 July Digital and marketing campaign at least two weeks before the focus week	List of topics and scripts will guide the programmes To be handled by the individual institutions (decentralised approach) Standard operation procedure
Media	Social media: <i>YouTube, Facebook, Tweeter</i>	Dedicated social media accounts developed and managed by professional(s) Grant holders' social media and websites	
	Mainstream media	Fully use the NYS Journalist in all hosting houses. Media brief should be developed and approved by 30 June	

2.2 Content dissemination methods

A detailed content delivery model below shows the content dissemination web.

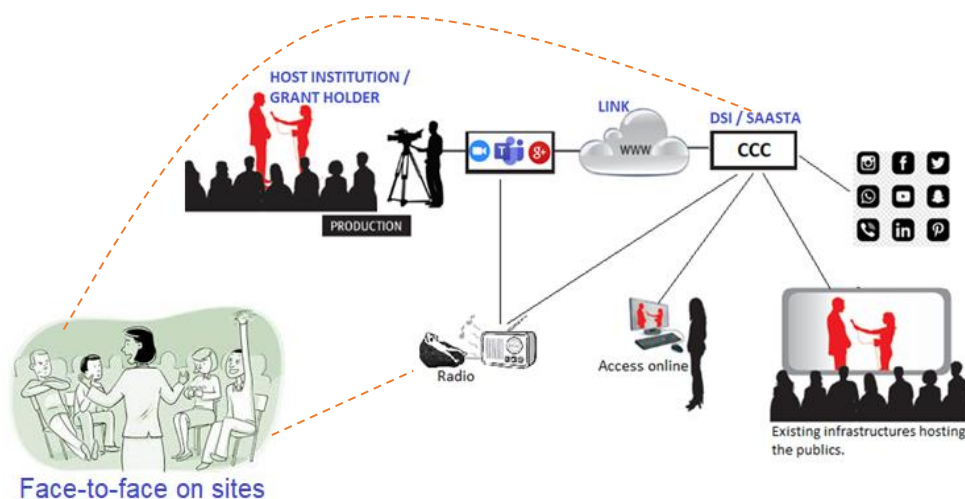


Figure 1: Hybrid NSW dissemination model.

2.2.1 Development of documentaries:

Institutions will develop, host and manage the whole process of documentary development in line with the topics as tabulated in Table 1. Apart from the topics that have been listed in this plan, institutions can suggest other topics or bring their recent existing documentaries that are relevant to the NSW 2022 theme for consideration and funding. One topic of documentary can be delivered by a group of institutions working together as partners. DSI/SAASTA may assist to facilitate the involvement of relevant role players in different ways like opening their facilities and allowing their experts for filming and interviews, where necessary. Documentaries will be released through a simulcast by a number of digital platforms to maximise the reach to the diverse publics.

2.2.2 Hosting of webinars:

The webinars will be developed and hosted by the institutions and only provides the links to be listed on the general NSW programme for publication, at least two weeks before the focus week. Dates and times for each topic which will be within the NSW focus week, but there could be others to be conducted in the build-up towards the focus week.

2.2.3 Physical (in-person)

Carefully selected sites will ensure that all district municipalities have at least one NSW activity. The process of deploying the institutions for in-person or physical engagement will be informed by Table 4. Table 4 shows the list of the institutions or facilities that are available for in-reach and outreach public engagement to be considered for this service. The mapping of the current available institutions per district is in Annexure A.

Table 4: The use of existing local infrastructures will be targeting the organised publics.

INFRASTRUCTURE	POSSIBLE ACTIVITIES
Higher Education Institutions and; Zoos, Parks, Gardens, and Museums	<ul style="list-style-type: none"> • Host and or partner with their institutions to host Webinars, interview local experts. • Advertisement of upcoming activities • Campus-based radio stations to Interview the identified experts that will form part of the panel of experts – telephonically, virtually or in-studio. • Radio stations will also broadcast the NSW activities to the communities out there
Schools	<ul style="list-style-type: none"> • At least 50 schools will be supported to attend the Webinars during the focus week. • The support will include provision of connectivity (modem and/or data). Learners and teachers will be able to ask questions or comments live. • Both webinars and documentaries will be accessed by schools at their convenient time, with data collected. • Other schools can still attend the webinars as they can afford.
Cofimvaba Science Centre	<p>Film:</p> <ul style="list-style-type: none"> • Science centre tour. <p>Live activities on digital platforms:</p> <ul style="list-style-type: none"> • At least one webinar to be hosted by or staged at the centre. • Demonstration of the telescope remote operation in one of the nights with some audience interacting remotely using cell phone or tablets.
Accredited science centres	<ul style="list-style-type: none"> • Science centres with an existing digital facilities and enough space to host the people who cannot afford data from their communities to watch the broadcasted Documentaries and Webinars. • Science centres must adhere to the COVID-19 protocols. • Selected science centres will receive grants to ensure that they are connected to access all the NSW activities. • 50 people per webinar and 50 per documentary to be hosted by each out of 20 science centres daily for five days of the focus week to afford 10,000 reach.

2.3 Resource and funding

The implementation of NSW 2022 will be conducted by the institutions / organisations that would have received grants funding and those that will use their resources and only contribute with content. Grants will be handled through the existing SAASTA Grant Management System. It will be desirable to build from the 2021 grant holders as the new role players are welcomed.

2.4 Target publics and content dissemination model

To maximise the participation and responding to strategic aims of the SES target designated sections of society referred to as the publics are depicted by Figure 2. There must be a balance in the development and rollout the NSW activities proportionally based on the demographics of the listed publics.

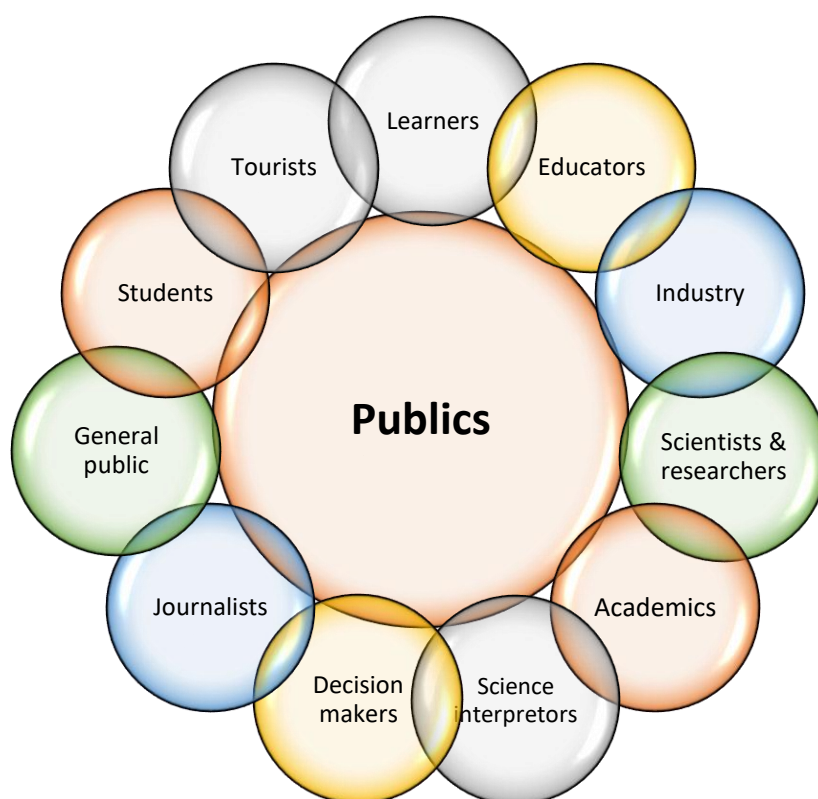


Figure 2: Depicts the 11 groupings of the publics

2.5 Enhancing the reach to target publics

The number of publics to be reached will be enhanced through a targeted approach by reaching out to them. Previous experience proved that media plays a crucial role in reaching more publics simply because it is able to reach people wherever they are at any time. Segmenting the publics through different categories per relevant media / channels with an understanding of the nature of information to be placed in their disposal will obviously capture their attention and subsequent meaning participation. Another element to be considered is to ensure that the content is not only user-friendly

and easily accessible through different devices, but simple to understand. The facilitation of social media and other platforms for webinars, documentaries, etc. need to be managed by *professionals*.

Furthermore, a digital marketing service provider to be appointed for the purpose of marketing and popularising the NSW 2022 activities through different media platforms such as social media, mainstream media and online. The campaign should start at least one month before the focus week.

ANNEXURE A: SITES MAPPING

District Municipalities and Metros with facilities to host NSW 2022

#	PROVINCE	NAME	SCIENCE CENTRES NAMES & NUMBER/MUNICIPALITY	MOBILES	MUSEUM, ZOO, GARDEN	UNIVERSITIES	SCIENCE COUNCILS	NO OF INSTITUTIONS / FACILITIES
1	EC	AMATHOLE	FOSST	✓		UFH		3
2		BUFFALO CITY METRO			EL MUSEUM, SANBI			1
3		CHRIS HANI	COFIMVABA	-				1
4		NELSON MANDELA BAY METRO	NMBSC	-	BAYWORLD	NMU	SAEON	4
5		OR TAMBO			NMM & HERITAG	WSU		2
6		SARAH BAARTMAN			ALBANY MUSEUM	RHODES	SAIAB	3
7	FS	MANGAUNG METRO			NATIONAL MUSEUM, SANBI	UFS, CUT		3
8		THABO MOFUTSANYANA				UFS	ARC	2
9	GP	CITY OF JOHANNESBURG METRO	I-SET, JNF MAMELODI	✓	CITY PARKS & ZOO	WITS, UNISA, UJ	MINTEK,	7
10		CITY OF TSHWANE METRO	SCI-ENZA	✓	DITSONG, SANBI, NZG	UP, TUT, SMU	SANSA, ARC, SAEON, NECSA, CSIR, NMISA, SACNASP	13
11		SEDIBENG	AMSC	✓		VUT		3

#	PROVINCE	NAME	SCIENCE CENTRES NAMES & NUMBER/MUNICIPALITY	MOBILES	MUSEUM, ZOO, GARDEN	UNIVERSITIES	SCIENCE COUNCILS	NO OF INSTITUTIONS / FACILITIES
12	KZN	AMAJUBA	AMSC NEWCSTL	✓	OCEANOGRAPHIC RESEARCH INSTITUTE			2
13		ETHEKWINI METRO	STEC-UKZN	✓	KZN MUSEUM, NATAL SHARK BOARD, SANBI	UKZN, DUT, MUT		7
14		UMGUNGUNDLOVU	WESSA	-				1
15		KING CETSHWAYO	CHRISTOPHER MEYER, UNIZULU SC	✓		ZULULAND		4
16	LP	CAPRICORN				UL		1
17		MOPANI	PHALABORWA, GIYANI	✓				3
18		VHEMBE	VUWANI	✓	SANBI	UNIVEN	SAWS, SAIP	6
19	MP	EHLANZENI	PENREACH	✓	BARBERTON MUS, SANBI, LOWVELD GARDEN	UMP	ARC, SAEON, SANBI,	6
20		GERT SIBANDE	MONDI	✓				2
21	NC	FRANCES BAARD				SPU	SAWS, SAEON	3
22		PIXLEY KA SEME	SKA CARNAVON, SAAO SUTHERLAND					2
23		DR KENNETH KAUNDA				NWU POTH		1
24		NGAKA MODIRI MOLEMA			NWU BOTANICAL GARDEN	NWU MAF		2
25	WC	CAPE WINELANDS	ITHEMBA LABS	✓		UWC, SU, CPUT	SAWS, CGS	5
26		CITY OF CAPE TOWN METRO			KIRSTENBOSCH, IZIKHO	UCT	ARC, CHPC, ITHEMBA, SAAO, SAEON	9

#	PROVINCE	NAME	SCIENCE CENTRES NAMES & NUMBER/MUNICIPALITY	MOBILES	MUSEUM, ZOO, GARDEN	UNIVERSITIES	SCIENCE COUNCILS	NO OF INSTITUTIONS / FACILITIES
27		GARDEN ROUTE	INKCUBEKO YOUTH & SC					1
28		OVERBERG	SANSA SC	✓				2
29		WEST COAST	AMSC Saldanha	✓				2
		TOTAL						102

22 Municipalities do not have existing institutions. They will be targeted for the outreach programme

#	PROVINCE	NAME	SCIENCE CENTRES NAMES & NUMBER/MUNICIPALITY	MOBILES	MUSEUM, ZOO, GARDEN	UNIVERSITIES	SCIENCE COUNCILS	NO OF INSTITUTIONS / FACILITIES
1	EC	ALFRED NZO						
2		JOE GQABI						
3	FS	FEZILE DABI						
4		LEJWELEPU						
5		XHARIEP						
6	GP	EKURHULENI						
7		WEST RAND						
8	KZN	ILEMBE						
9		UGU						
10		UMZINYATHI						
11		UTHUKELA						
12		UMKHANYAK		-				
13		HARRY GWALA						
14		ZULULAND						
15	LP	SEKHUKHUNE						
16		WATERBERG						
17	MP	NKANGALA						
18	NC	JOHN TAOLO G						
19		NAMAKWA						
20		ZF MGCAWU						
21	NW	BOJANALA						
22		DR RUTH						
23	WC	CENTRAL KAROO						

[illegible]

** Learners, Educators, Tourists, Science interpreters, Scientists & Researchers, Students, Industry, Journalists, Decision makers, Indigenous Knowledge-holders, general public.