

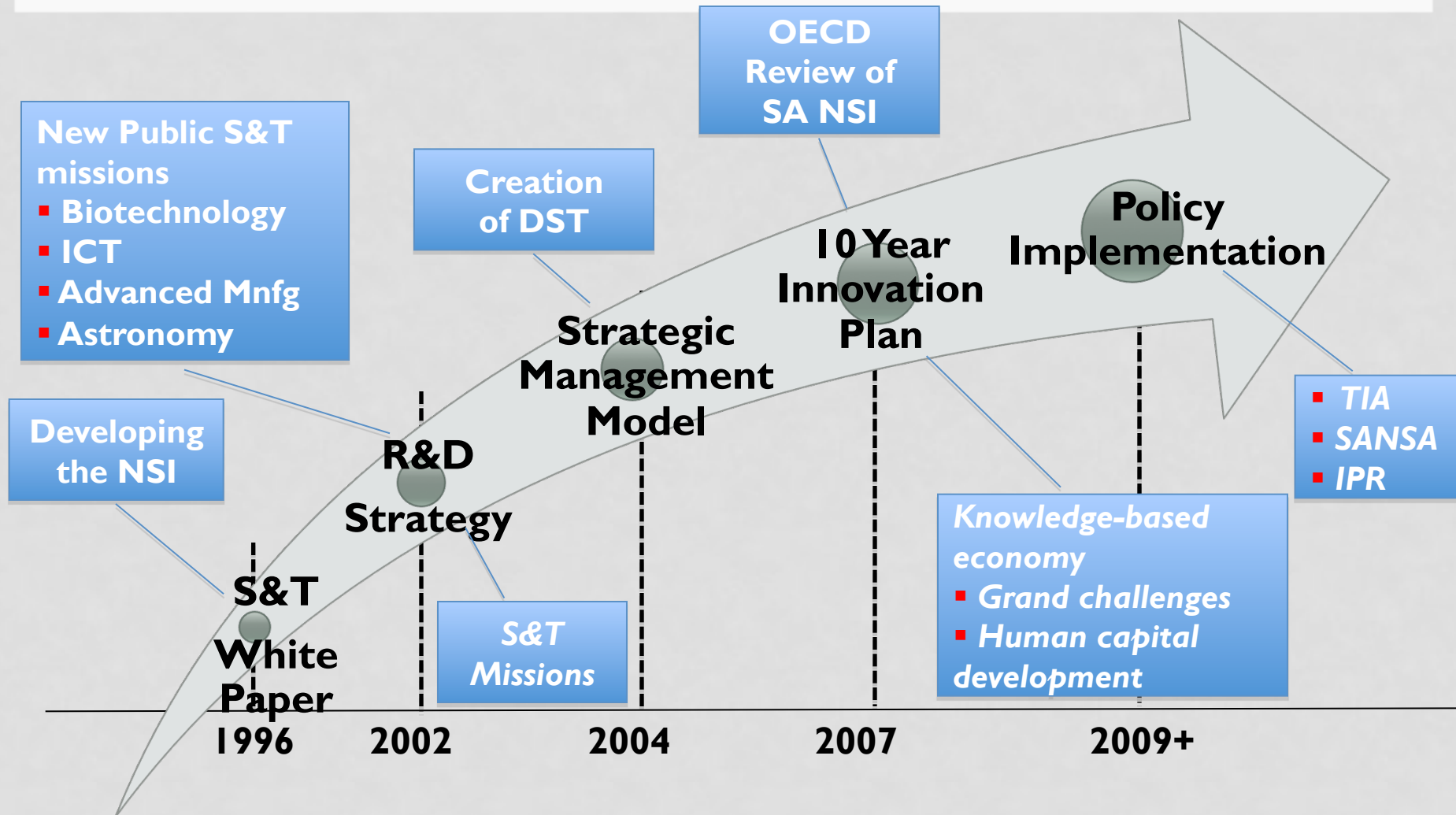
# Science in Society

07 November 2014



**Ms Eudy Mabuza**  
**Minister Counsellor: Science and Technology**  
**Embassy of the Republic of South Africa, in Japan**

# POLICY/STRATEGY FRAMEWORK



# NRF DIVISIONS

*The relationships between the NRF Vision and composition*

World-class Research  
Transformed Society  
Sustainable Environment

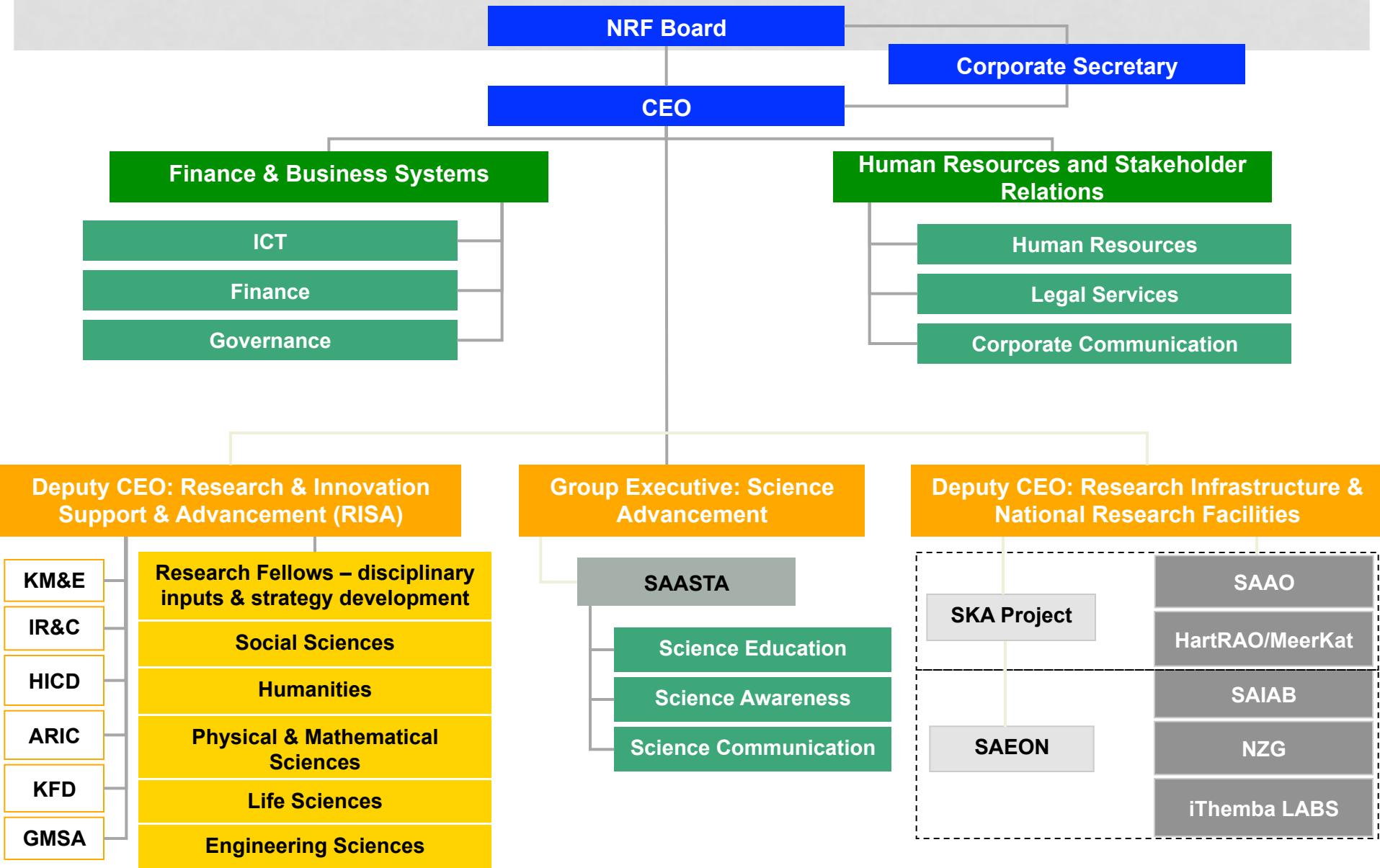
Research, Innovation  
Support & Advancement  
(RISA)

National  
Research  
Facilities

Public S&T education  
and outreach

National Research Foundation

# NRF STRUCTURE





# NRF/SAASTA MANDATE

To advance public **awareness, appreciation** and **engagement** of science, engineering and technology (SET) in South Africa through

- **Science Education** – build up the supply of tomorrow's scientists and innovators
- **Science Awareness** – engage the public with the phenomena of science, engineering and technology
- **Science Communication** – share science and technology advancements with the public, building up their appreciation of the benefits of science



# SCIENCE COMMUNICATION

- Providing credible and accurate information on science, engineering and technology that is accessible to all South African communities.
- **Processes:**
  - Scientific editorial process
  - Scientific editing
  - Audience analysis
- **Focus areas:**
  - Science and the media
  - Science promotion
  - Science communication and capacity building





# WE ARE ...

... touching people's lives  
by growing their awareness  
of science

## TOUCH

SCIENCE **AWARENESS**

... sharing the excitement  
and achievements of  
science in daily life

## SHARE

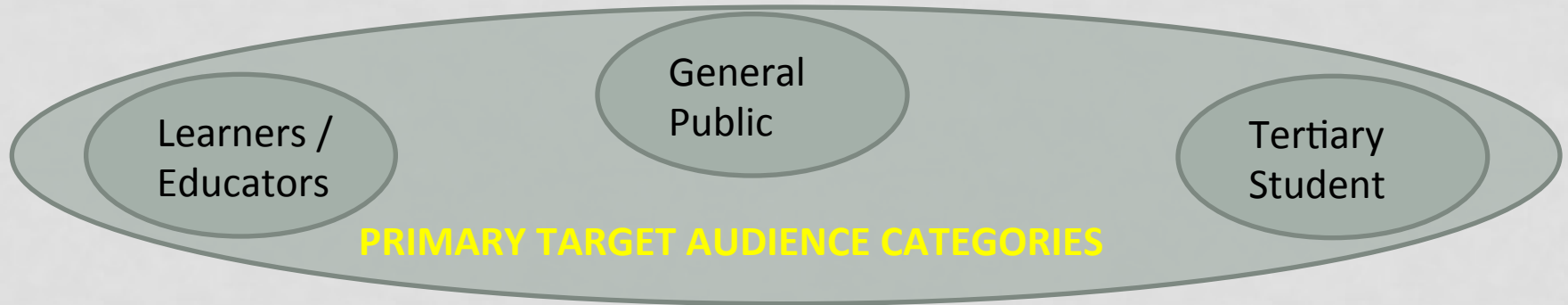
SCIENCE **COMMUNICATION**

... transforming lives by  
educating a new generation of  
young scientists

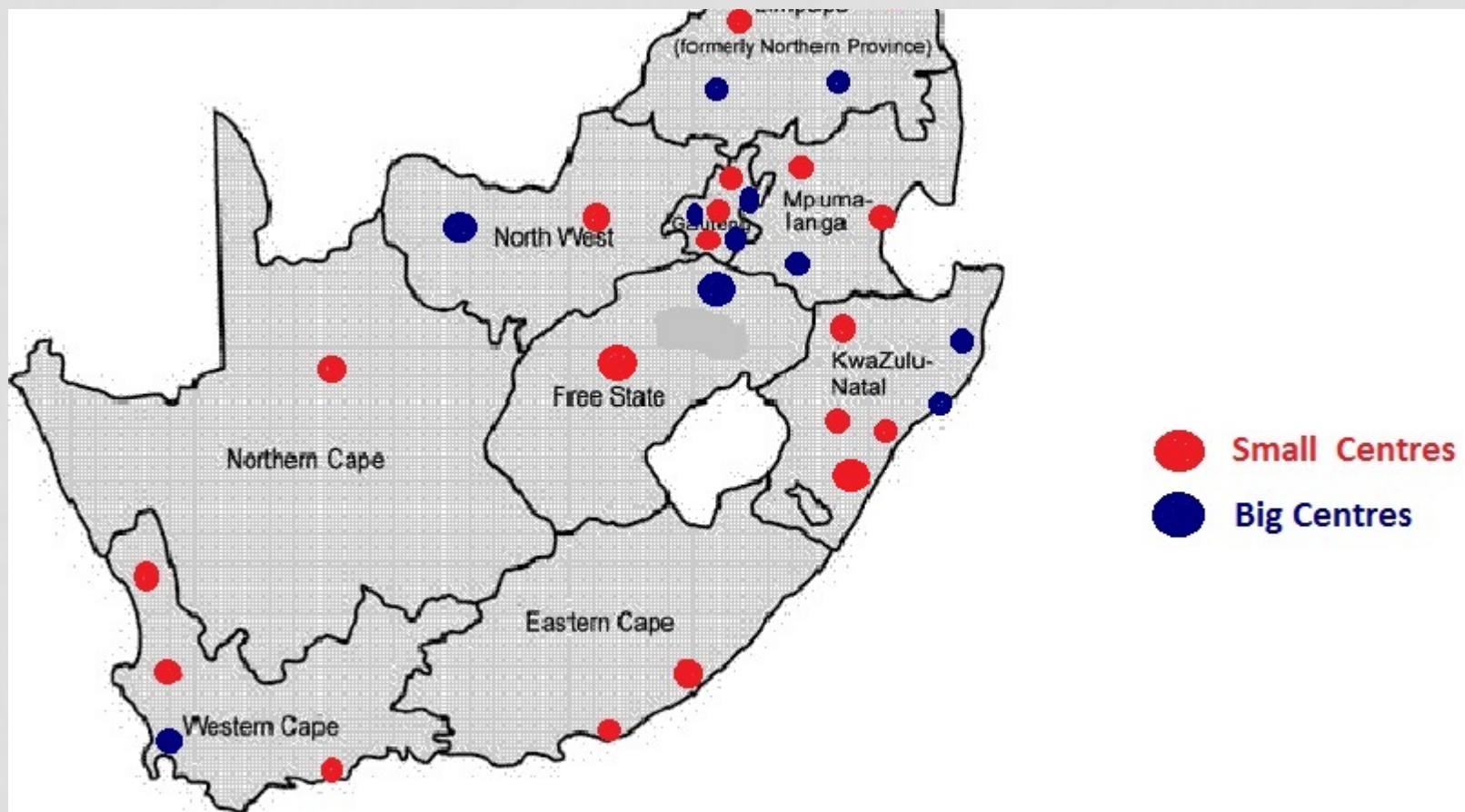
## TRANSFORM

SCIENCE **EDUCATION**

# INTERPRETING THE MANDATE OF SAASTA



# SCIENCE CENTRE NETWORK



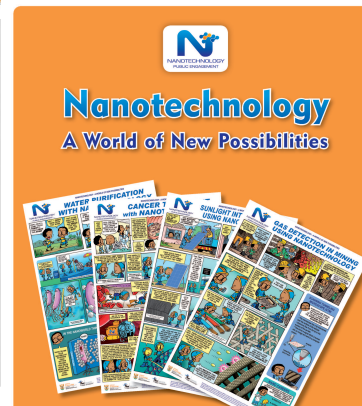


# PROVISION OF RESOURCES IN THE SYSTEM

- Curriculum aligned Science, Mathematics educational resources and science kits to learners, educators and schools;
- Resources on SET careers
- Mobile labs, science exhibits, touch screens and funding SET initiatives to science centres
- Fact sheets to students and public



**PERIODIC TABLE of the ELEMENTS**  
Dmitri Mendeleev (1869 - 1907)





**Public Understanding of Biotechnology**  
www.pub.ac.za

# PERIODIC TABLE of the ELEMENTS

**NRF** National Research Foundation  
**SAASTA** South African Agency for Science and Technology Advancement  
www.saasta.ac.za

**science & technology**  
Department of Science and Technology  
REPUBLIC OF SOUTH AFRICA

He Helium 2 4.00

**Li** Lithium 3 6.94  
**Be** Beryllium 4 9.01  
**Mg** Magnesium 12 24.31  
**Na** Sodium 11 22.99

**Alkali Metals**  
**Alkali Earth Metals**  
**Transition Metals**  
**Other Metals**  
**Other Nonmetals**  
**Halogens**  
**Noble Gases**  
**Rare Earth Metals**

At room temperature the element is:  
Gas  
Liquid  
Natural solid  
Man-made solid (synthetic)

**H** Hydrogen 1 1.01

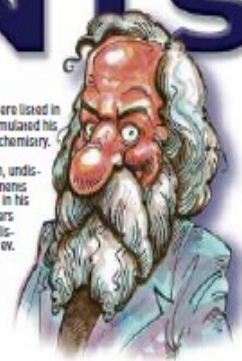
Symbol  
Element name  
Atomic number  
Atomic mass

## DMITRI MENDELEYEV (1834 - 1907)

The Russian chemist, Dmitri Mendeleev, was the first to observe that if elements were listed in order of atomic mass, they showed regular (periodical) repeating properties. He formulated his discovery in a periodic table of elements, now regarded as the backbone of modern chemistry.

The crowning achievement of Mendeleev's periodic table lay in his prophecy of then, undiscovered elements. In 1869, the year he published his periodic classification, the elements gallium, germanium and scandium were unknown. Mendeleev left spaces for them in his table and even predicted their atomic masses and other chemical properties. Six years later, gallium was discovered and his predictions were found to be accurate. Other discoveries followed and their chemical behaviour matched that predicted by Mendeleev.

This remarkable man, the youngest in a family of 17 children, has left the scientific community with a classification system so powerful, that it became the cornerstone in chemistry teaching and the prediction of new elements ever since. In 1955, element 101 was named after him: Md, Mendelevium.



**B** Boron 5 10.81  
**C** Carbon 6 12.01  
**N** Nitrogen 7 14.01  
**O** Oxygen 8 16.00  
**F** Fluorine 9 19.00  
**Ne** Neon 10 20.18  
**Al** Aluminium 13 26.98  
**Si** Silicon 14 28.09  
**P** Phosphorus 15 30.97  
**S** Sulphur 16 32.06  
**Cl** Chlorine 17 35.45  
**Ar** Argon 18 39.95

**K** Potassium 19 39.10  
**Ca** Calcium 20 40.08

**Sc** Scandium 21 44.96  
**Ti** Titanium 22 47.88

**V** Vanadium 23 50.94  
**Cr** Chromium 24 52.00  
**Mn** Manganese 25 54.94

**Fe** Iron 26 55.85  
**Co** Cobalt 27 58.93  
**Ni** Nickel 28 58.69

**Cu** Copper 29 63.55  
**Zn** Zinc 30 65.39  
**Ga** Gallium 31 69.72

**Ge** Germanium 32 72.61  
**As** Arsenic 33 74.92  
**Se** Selenium 34 78.96

**Br** Bromine 35 79.90  
**Kr** Krypton 36 83.80

**Rb** Rubidium 37 85.47  
**Sr** Strontium 38 87.62  
**Y** Yttrium 39 88.91

**Zr** Zirconium 40 91.22  
**Nb** Niobium 41 92.91  
**Mo** Molybdenum 42 95.94  
**Tc** Technetium 43 (98)  
**Ru** Ruthenium 44 101.07  
**Rh** Rhodium 45 102.91  
**Pd** Palladium 46 106.42  
**Ag** Silver 47 107.87  
**Cd** Cadmium 48 112.41  
**In** Indium 49 114.82  
**Sn** Tin 50 118.71  
**Sb** Antimony 51 121.76  
**Te** Tellurium 52 127.60  
**I** Iodine 53 126.90  
**Xe** Xenon 54 131.29

**Ba** Barium 56 137.33  
**Cs** Cesium 55 132.91

**Lanthanide Series**

**Ta** Tantalum 73 180.95  
**Hf** Hafnium 72 178.49

**Re** Rhenium 75 186.21  
**Os** Osmium 76 190.23  
**Ir** Iridium 77 192.22  
**Pt** Platinum 78 195.08  
**Au** Gold 79 196.97  
**Hg** Mercury 80 200.59

**Tl** Thallium 81 204.38  
**Pb** Lead 82 207.20  
**Bi** Bismuth 83 208.98

**Po** Polonium 84 (209)  
**At** Astatine 85 (210)  
**Rn** Radon 86 (222)

**U** Uranium 92 238.03  
**Np** Neptunium 93 (237)  
**Pu** Plutonium 94 (244)  
**Am** Americium 95 (243)  
**Cm** Curium 96 (247)  
**Bk** Berkelium 97 (247)  
**Cf** Californium 98 (251)  
**Es** Einsteinium 99 (252)  
**Fm** Fermium 100 (257)  
**Md** Mendelevium 101 (258)  
**No** Nobelium 102 (259)  
**Lr** Lawrencium 103 (260)

**Ac** Actinium 89 (227)  
**Th** Thorium 90 (232)  
**Pa** Protactinium 91 (231)  
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**Bk** Berkelium 97 (247)  
**Cf** Californium 98 (251)  
**Es** Einsteinium 99 (252)  
**Fm** Fermium 100 (257)  
**Md** Mendelevium 101 (258)  
**No** Nobelium 102 (259)  
**Lr** Lawrencium 103 (260)

**Uuo** Ununoctium 118 (294)

**Ra** Radium 88 (226)  
**Fr** Francium 87 (223)

**Actinide Series**

**Rf** Rutherfordium 104 (261)  
**Db** Dubnium 105 (262)  
**Sg** Seaborgium 106 (266)  
**Bh** Bohrium 107 (264)  
**Hs** Hassium 108 (277)  
**Mt** Meitnerium 109 (268)  
**Ds** Darmstadtium 110 (271)  
**Rg** Roentgenium 111 (272)  
**Uub** Ununbium 112 (285)  
**Uut** Ununtrium 113 (284)  
**Uuq** Ununquadium 114 (289)  
**Uup** Ununpentium 115 (288)  
**Uuh** Ununhexium 116 (292)  
**Uus** Ununseptium 117 (Not yet observed)  
**Uuo** Ununoctium 118 (294)

**La** Lanthanum 57 138.91  
**Ce** Cerium 58 140.12  
**Pr** Praseodymium 59 140.91  
**Nd** Neodymium 60 144.24  
**Pm** Promethium 61 (145)  
**Sm** Samarium 62 150.36  
**Eu** Europium 63 151.96  
**Gd** Gadolinium 64 157.25  
**Tb** Terbium 65 158.93  
**Dy** Dysprosium 66 162.50  
**Ho** Holmium 67 164.93  
**Er** Erbium 68 167.26  
**Tm** Thulium 69 168.93  
**Yb** Ytterbium 70 173.05  
**Lu** Lutetium 71 174.97

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For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.

# FRAMEWORK/APPROACH: SCHOOL INTERVENTIONS

OBJECTIVE	MEANS TO REACH OBJECTIVE
1. Learner Performance	Learner camps during school holidays; educator workshops on content and methodology; provision of curriculum educational resource materials to learners, educators and schools
2. Learner and Educator Participation	Through science festivals such as National Science Week and interaction with science exhibits
3. Identify & Nurture Talent	Through Olympiads and Competitions such as the Natural (grades 6 -9) and National Science Olympiads (10 -12), Astronomy Quiz and School Debates
4. SET Careers Awareness	Interaction with appropriate role models in SET; visits to SET related industries and provision of educational resource materials.



# OUR IMPACT

- Science Awareness, Engagement and Advancement
- Identifying, nurturing and Developing Tomorrow's Leaders



# SCIENCE AWARENESS, ENGAGEMENT AND ADVANCEMENT

**Through:** Science festivals, interaction with exhibits, science clubs, Media Round Tables, Critical Thinkers Forum, Science Shows



South Africa



# IDENTIFYING, NURTURING AND DEVELOPMENT TALENT

**Through:** Olympiads and competitions; camps, learner and teacher development programmes, exposure to career opportunities in SET through Role modelling and Internships





# Beijing, March 2014

## Presentation in Beijing



# MEDIA PARTNERS





# IMPACT: STAKEHOLDERS RELATIONSHIPS & COLLABORATIONS

- Government Departments - Funding and providing access to schools and expertise.
- Higher Education Institutions - Expertise, sharing of resources
- Science Councils - Infrastructure and expertise
- Science Centres - Implementation
- Business Sector - Funding, expertise and infrastructure
- Professional Association - Implementation and expertise

# OVERALL OUTPUT OF OUR INTERVENTIONS

- **Social Relevance:**

80% of our reach is in rural areas and disadvantaged communities

- **Economic Relevance:**

Address the shortage of skills in STEMI

- **Scientific Relevance:**

Through it's science awareness outreach activities , SAASTA put the world of Science in the hands of society.



# The DST Minister



South Africa



**DANKIE, ENKOSI,  
ARIGATO  
THANK YOU**

