



science
& technology

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

**NATIONAL PLAN FOR
SCIENCE, TECHNOLOGY,
ENGINEERING & MATHEMATICS
OLYMPIADS, COMPETITIONS
AND CAMPS**

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OLYMPIADS, COMPETITIONS AND
CAMPS**

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TABLE OF CONTENTS

ACRONYMS

EXECUTIVE SUMMARY

PREFACE

INTRODUCTION

THE STRATEGY

CURRENT REALITY

- Definition of olympiads, competitions and camps
- Purpose
- Data capturing, analysis and reporting
- Eligibility
- Participation
- Support
- Supplementary tuition
- Content
- Camps and excursions
- Competitive levels/stages
- Awards and rewards
- Synergy
- Communication and advocacy
- Ownership
- Intellectual property rights

KEY FOCUS AREAS

- Definition of olympiads, competitions and camps
- Purpose
- Data capturing, analysis and reporting
- Eligibility
- Participation
- Support
- Supplementary tuition
- Content
- Camps and excursions
- Competitive levels/stages
- Awards and rewards
- Synergy and coordination
- Ownership
- Communication and advocacy
- Intellectual property rights

DELIVERABLES

IMPLEMENTING AND RESOURCING THE PLAN

INFORMATION SOURCES

ANNEXURES

ACRONYMS

AMU	AFRICAN MATHEMATICAL UNION
AMESA	ASSOCIATION OF MATHEMATICS EDUCATORS OF SOUTH AFRICA
DOE	DEPARTMENT OF EDUCATION
DST	DEPARTMENT OF SCIENCE AND TECHNOLOGY
FET	FURTHER EDUCATION AND TRAINING
GET	GENERAL EDUCATION AND TRAINING
IMO	INTERNATIONAL MATHEMATICAL OLYMPIAD
KZN	KWA-ZULU NATAL
IPMO	INTER-PROVINCIAL MATHEMATICS OLYMPIAD
PAMO	PAN AFRICAN MATHEMATICS OLYMPIAD
SAASTA	SOUTH AFRICAN AGENCY FOR SCIENCE AND TECHNOLOGY ADVANCEMENT
SAASTE	SOUTH AFRICAN ASSOCIATION OF SCIENCE AND TECHNOLOGY EDUCATORS
SAMF	SOUTH AFRICAN MATHEMATICS FOUNDATION
SAMO	SOUTH AFRICAN MATHEMATICS OLYMPIAD
SAMS	SOUTH AFRICAN MATHEMATICAL SOCIETY
STEM	SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS
SWOT	STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS
UCT	UNIVERSITY OF CAPE TOWN

EXECUTIVE SUMMARY

The science, engineering and technology sector is characterised by numerous human resource-related problems. Among these are the low enrolment of learners in mathematics, science and technology (especially Black and female learners) and a declining scientific research population that is not being renewed at an adequate rate with young scientists.

In order to arrest the declining scientific research population our youth, especially those from disadvantaged backgrounds must participate in numbers in Science, Technology, Engineering and Mathematics (STEM). In order to increase enrolments in STEM, the Department of Science and Technology (DST) in collaboration with the Department of Education (DoE) agreed in their Collaboration Agreement and Plan to use Olympiads, Competitions and Camps as vehicles to identify and nurture learners (especially African and girl learners) with talent and potential in STEM. The two Departments have agreed to achieve this goal by increasing the number of schools participating in Olympiads, Expos, Fairs and Competitions to 30% by 2008. Special emphasis will be placed on those schools from disadvantaged backgrounds. Through the DST/DoE collaboration, it is also intended to utilise Olympiads, Competitions and Camps (and other events such as festivals) to increase the number of learners passing higher-grade maths and science to 50 000 by 2008.

The review of Olympiads and Competitions that was conducted by the Department of Science and Technology highlighted their potential to serve as levers for identifying and nurturing talent and potential in STEM. This National Plan is a product of the review of some established STEM Olympiads and Competitions, stakeholder consultation and the Department's experience with maths and science camps. This plan proposes key interventions required to make Olympiads, Competitions and Camps effective vehicles

to identify and nurture the talent and potential desperately needed for the National System of Innovation.

Given the magnitude of implementing this National Plan, partnerships with existing Olympiads, Competitions and Camps will be sought to support its delivery. Several initiatives such as agreements with other government departments and private sector organisations will be developed and/or sustained and strengthened, if not replicated. Various other avenues such as the use of higher learning institutions and collaboration with Science Centres will be explored in order to help give effect to this National Plan. The Olympiads, Competitions and Camps Task Team, chaired by the Department of Science and Technology, will coordinate the implementation of the National Plan. The Department of Science and Technology will serve as the umbrella body responsible for the ultimate coordination of South Africa's STEM Olympiads, Competitions and Camps, under the auspices of this Plan.

PREFACE

The development of this National Plan commenced with a review of established¹ Science, Technology, Engineering and Mathematics (STEM) Olympiads, Competitions and Camps in South Africa. Only established Olympiads and Competitions were reviewed because they had the potential to provide the review exercise with lessons and insights needed to inform future interventions. As a result, young Olympiads such as the 2005 Physics Olympiad, the 2005 National Aviation and Space Science Olympiad, and the Standard Bank/CSSA Computer Olympiads were not included in the review.

The review report was tabled on 29 June 2005 at a Think Tank Meeting attended by the Departments of Science and Technology (DST), and Education (DOE), the South African Mathematics Foundation (SAMF) and the South African Agency for Science and Technology Advancement (SAASTA) (see attendance list attached as Annexure A). This group will serve as the Olympiads, Competitions and Camps Task Team until a more formal structure of managing Olympiads, Competitions and Camps is established. STEM Camps were added to the National Plan subsequent to the Department of Science and Technology's experience with one of its keystone youth projects namely, the DST/Thuthuka Maths and Science Development Camps.

The first Think Tank Meeting resolved to invite representatives of the established² Olympiads and Competitions to a second meeting at which more insights would be shared with the view to proposing and adopting a draft national plan of action. This second meeting was held on 12 August 2005. A list of attendees is attached at Annexure C. At this meeting, the Draft National Plan was adopted with amendments.

² "Established" refers to Mathematics Olympiads and/or Competitions that have been in existence for greater than 10 years and Science Olympiads and/or Competitions that have been in existence for more than 5 years.

The Think Tank Meeting also identified data gaps in the draft review and opted to use the questionnaire attached as Annexure B to gather more insights into the strengths and challenges facing Olympiads and Competitions in South Africa. Although only 63% of the questionnaires were returned, the data obtained enabled the Department of Science and Technology to proceed with facilitating the final draft of the National Plan that was presented at the National Consultative Conference which was held on 25 and 26 October 2005. The National Plan was adopted at the Consultative Conference and approved in February 2006 by Dr Rob Adam, the then Director-General of Science and Technology.

INTRODUCTION

The Science and Technology White Paper (1996) and the Research and Development Strategy (2002) identified disparities in skills and competences that result in the reproduction of inherited, skewed racial, ethnic and gender hierarchies in private, parastatal and public employment. To address this shortcoming, new integrated science curricula that reflect non-racial, non-sexist and democratic values have been developed and declared policy. These curricula are designed to be relevant to both the individual as well as to the socio-economic demands of society. They have replaced content-driven syllabi with problem-solving approaches thereby ensuring a balance between theory and practice, and academic and application skills.

In the General Education and Training Band (i.e. Grades R-9), Natural Sciences, Technology and Mathematics are now compulsory. In the Further Education and Training Band (i.e. Grades 10-12 and technical colleges), Mathematical Literacy or Mathematics is a compulsory subject. Learners who wish to enrol for science subjects will have to choose among Physical Sciences, Life Sciences, Computer and Agricultural Sciences subjects in the schooling system and science-related unit standards in technical colleges. The Higher Education and Training Band is repositioning itself to meet the new demands of the 21st century.

The above curriculum change developments, while welcomed, pose a challenge to the system due to the inadequate fiscal, physical and material resources required to implement them. These challenges are exacerbated by under-enrolment and under-performance in mathematics, science and technology fields due to apathy, technophobia and lack of effective career education.

Although progress has been made through public awareness programmes, in collaboration with consortia of institutions, professional associations, academics, science museums, science centres, media and business to put science and

technology on the map, the enrolment and performance in mathematics and science subjects remains poor. The numbers produced, especially among African and girl learners, remain pitifully low. This untenable situation requires new and innovative approaches to developing human resources in science, technology, engineering and mathematics (STEM).

In order to arrest the declining scientific research population, our youth, especially those from disadvantaged backgrounds must participate in numbers in STEM. Unfortunately, the impact of Olympiads, Competitions and Camps has never been formally determined. The review of Olympiads and Competitions that was conducted by the Department of Science and Technology, the subsequent meetings with key stakeholders and the Department's experience with its Maths and Science Development Camps highlighted the potential of these instruments to serve as levers for identifying and nurturing talent and potential in STEM.

THE STRATEGY

In order to increase enrolments in STEM, the Department of Science and Technology (DST) in collaboration with the Department of Education (DoE) agreed in their Collaboration Agreement and Plan (see Annexure D and Annexure E) to use Olympiads, Competitions and Camps as vehicles to identify and nurture learners (especially African and girl learners) with talent and potential. The two Departments have agreed to achieve this goal by increasing the number of schools participating in Olympiads, Expos, Fairs and Competitions to 30% by 2008. Through the DST/DoE collaboration, it is also intended to utilise Olympiads, Expos, Fairs and Competitions and Camps to increase the number of learners passing higher-grade maths and science to 50 000 by 2008. Special emphasis will be placed on those schools/learners from disadvantaged backgrounds.

The decision taken at the Curriculum Management Committee meeting of March 2005 was that Maths, Science and Technology Learning Area Committees, located in all Provinces, would be used to ensure that 30% of schools in each district participate. The three Learning Area Committees will also train educators to support their learners effectively.

The Departments of Science and Technology, and Education will include the use of Olympiads, Competitions and Camps to identify and nurture talent and potential in collaboration agreements with other Government Departments.

CURRENT REALITY

The review of Olympiads and Competitions used data collected either from relevant contact persons at the various organisations or via desktop research conducted by the Department of Science and Technology. The SWOT analysis of information collected on the following Olympiads and Competitions was presented at the first Think Tank Session of 29 June 2005, which resolved to use the attached template (Annexure B) to gather more detailed information on the following established Olympiads and Competitions:

- Eskom Expo for Young Scientists
- UCT Maths Competition
- Mintek Minquiz
- Pan African Mathematics Olympiad
- South African Mathematics Olympiad
- Interprovincial Mathematics Olympiad
- ISPAT ISCOR National Science Olympiad
- National Natural Science and Biology Olympiads

Five of the eight established Olympiads and Competitions responded to the questionnaire. A SWOT analysis of the DST/Thuthuka Maths and Science Development Camps was obtained prior to the National Consultative Conference which was held on 25 and 26 October 2005. The information presented in this section is based on the input received from the preliminary review, the questionnaires, and the Department's experience with the DST/Thuthuka Maths and Science Development Camps.

DEFINITION OF OLYMPIADS, COMPETITIONS AND CAMPS

It is important that a nationally agreed-upon definition for Olympiads, Competitions and Camps be adopted to enable targets to be set and monitored.

Olympiads

Conspicuous by its absence is a nationally agreed-upon definition of Olympiads. Often the terms Olympiads and Competitions are used interchangeably. Whilst all Olympiads are Competitions, not all Competitions are Olympiads.

Competitions

The responses received define competitions broadly as activities that provide learners with opportunities to display their work, interests and activities in science and technology. The competitions are conducted in a manner that contribute to the development of critical skills to meet the needs of the economy by stimulating interest and encouraging participation in STEM by the South African youth. The competitions are, theoretically, open to all school learners who are interested in any branch of mathematics, science and technology, and cater for learners who are interested in mathematical and scientific topics beyond the requirements of the school syllabus.

Camps

Camps, a worldwide phenomenon, are valued as excellent vehicles for the delivery of educational experiences outside of the schooling system. A desktop review of definitions of camps resulted in the following:

- They are non-secure residential programmes providing services to youth.
- They are a place where organised instruction is provided.

PURPOSE

Olympiads, Competitions and Camps provide effective ways of popularising STEM and thereby, improving their public image. More importantly, Competitions, Olympiads and Camps are used to identify talented youth deserving financial support and recruitment to higher education institutions and industry.

DATA CAPTURING, ANALYSIS AND REPORTING

Disaggregated collection of data is vital to understanding the performance of Olympiads, Competitions and Camps. While lists of all winners broken down into prize category, region, name, surname and subject could be obtained, many of the reviewed Olympiads and Competitions were not able to provide disaggregated data along race, gender and disability lines. Respondents cited high costs involved with the collection of disaggregated data as a negative factor. In order to report progress or lack of it, disaggregated data collection needs improvement.

Certain institutions retain full contact details of top performing learners. The performance of these learners in other STEM initiatives is tracked and the personal information is used to recruit learners into university. In addition, some events are used by private sector organisations to identify learners with talent and potential for their bursary schemes.

The DST/Thuthuka Maths and Science Development Camps utilise a sophisticated tracking system to collect data on the participants as well as track their progress into tertiary studies.

ELIGIBILITY

Eligibility criteria vary between the different events. Entrance fees and school performance (termed 'merit') are the most cited criteria permitting learners to enrol for

Olympiads, Competitions and Camps. Some Olympiads and Competitions and the DST/Thuthuka Camps charge entry fees as a means of sustaining themselves or ensuring the commitment of the learners. The potential exists for these fees to serve as a deterrent to learners from historically and currently disadvantaged areas. Those that do not charge entrance fees are cross-subsidised.

In some cases, entrants are expected to pay a nominal entry fee in the first round of Olympiads and not again in later rounds. The fees range from R10 to R20 per learner depending on time of registration. These costs are used for administrative and maintenance costs. For example, in some instances, a minimum of 10 entries per grade in each school is used to deal with costs associated with postage and administration. For less than 10 entries per grade, schools would be required to pay an additional nominal amount per grade to offset postage and administration costs.

There are special cases where Principals from disadvantaged schools are permitted to send a letter of motivation asking for the entry fee to be waived.

Eligibility for continental and international Olympiads and Competitions are event specific.

PARTICIPATION (TARGET AUDIENCE)

While Competitions seem to be open to all high school learners (i.e. Grades 8 and 9 in the GET band and Grades 10, 11 and 12 in the FET band) many Olympiads and the DST/Thuthuka Camps target mainly learners in the FET band. Although it was difficult to obtain a reliable number of schools and learners who participate annually in the established Olympiads and Competitions, it was determined that between 1000 and 2000 schools participate in the established Olympiads and Competitions. With respect to the DST/Thuthuka Camps, approximately 1200 learners participated in 2005. For FET, this is impressive as the number makes about 17-33% of high schools. This number of schools attracts no less than 60 000 learners.

Some of the Olympiads and Competitions as well as the DST/Thuthuka Camps mentioned the participation of girls as a limiting factor. The girls that do participate often feel intimidated and do not participate as actively as boys do.

Furthermore, owing to the new focus on the increased participation of Black learners from previously disadvantaged backgrounds, some of the Competitions reported that they are witnessing a decline in the number of participants from traditionally White schools. In spite of this observation, it is acknowledged that the number of African learners is still low and their performance poor. Some of the reasons cited for this observation include: (a) dysfunctional schools; (b) shortage of qualified and committed educators; and (c) poor preparation in the basics in primary school.

In general, the number of participating schools has not been increasing fast enough and this may be attributed to the lack of interest on the part of schools. The predominant focus of Olympiads and Camps on learners from the FET phase limits the potential to identify talent and potential early in the schooling career of learners.

Concerns have also been raised about the limited number of higher-grade maths and science learners from previously disadvantaged backgrounds who meet the minimum academic criteria for participation. In certain instances, standard-grade learners are accommodated but the standard of performance of these learners threatens overall tertiary ability.

SUPPORT

Funding remains one of the biggest threats to almost all the Olympiads and Competitions reviewed. Limited funding also impacts on the DST/Thuthuka Camps as only six Provinces can be accommodated currently. The lack of funding limits travel to foreign destinations to compete in other Olympiads and Competitions. It hinders the logistical planning for local, regional, provincial and national events (venues, marketing,

prizes and travel) and reduces opportunities for learner and educator development programmes. Despite entry fees being charged in some cases, these are not enough to offset rising administration costs and some organisers would like to ensure that the entry fee remains at an affordable price for the learners. In certain instances, it hinders the recruitment of new schools into the events; especially those from rural areas.

Regional coordinators, most of whom are full-time educators, are limited in terms of number and availability, and are thus not effectively recruiting new schools into certain events. In order to sustain and maintain the educators, some Olympiads provide participating educators with Certificates as incentives.

Commissioned books consisting of past Olympiad questions and their detailed solutions and commentaries provide support required by participants. These books are designed so that the problems may be incorporated by the educator into lessons without having to search for suitable problems.

In spite of initiatives taken by individual Olympiads and Competitions, external support is desperately needed. Support for educators in preparing their learners for the Olympiad and Competitions is desperately needed.

SUPPLEMENTARY TUITION

Many question papers with problems and full solutions are distributed free each year to all participating schools. In addition, training guides that are designed for self-study also provide introductory problem solving skills for, especially, FET learners. What is inadequate is the face-to-face tuition required to equip participants with competences to perform well in Olympiads and Competitions. The study by the Department of Science and Technology on the state of supplementary tuition found that at least 75 000 learners benefit from a variety of supplementary tuition programmes offered in the country. It is important to find ways and means of using this service for the benefit of Olympiads and

Competitions. For the DST/Thuthuka Camps, supplementary tuition takes the form of tutorials that are curriculum related.

CONTENT

The question papers utilised in some of South Africa's Olympiads and Competitions are set to high standards of correctness, good use of language and immaculate typesetting. In certain cases, the questions in each paper are carefully graded from easy to difficult, giving all contestants a feeling of achievement while still maintaining challenging problems to discriminate between the bright and the very bright students.

A large number of local high school educators are involved in setting question papers, supervising the writing of the examinations and providing supplementary tuition. In some cases, the papers comprise subject-specific questions covered in the formal syllabi/curricula. The MINTEK Minquiz, for example, consists of multiple choice questions on: chemistry (25%), physics (25%), mathematics (25%) and general knowledge (25%). Eighty percent of the content is drawn from the Grade 12 curriculum.

CAMPS AND EXCURSIONS

Camp programmes usually develop the much needed problem-solving skills that tend to stand Olympiad and Competition participants in good stead. In some instances, mathematical and science camps are held each year to select and train teams for Olympiads. A group of learners who excel or demonstrate potential in the Olympiads are invited to participate in week-long events consisting of stimulating lectures, excursions, industry visits and other fun events. Furthermore, a group of learners demonstrating exceptional performance and potential are selected to attend the overseas fora. Thus, camps are important grounds for identifying and nurturing talent and potential required to succeed in Olympiads and Competitions.

The Camps are, more often than not, convened more than once a year. Some make use of the holidays to invite learners who have shown their interest and ability. As alluded to earlier, the requirement to cover their travel costs could serve as a limiting factor. Nevertheless, this does not diminish the importance of camps to identify and nurture talent and potential.

Learners normally participate in camp activities in teams and led by student coaches who had themselves been members of Olympiads teams. Other Camps such as the DST/Thuthuka Maths and Science Development Camps provide learners with supplementary tuition in maths and science. In addition, they provide learners with Life Orientation lessons that include career education.

COMPETITIVE LEVELS/STAGES

Many of the Olympiads and Competitions have multiple rounds that take place at local, regional and (inter) national levels. In some cases, winners of national Olympiads and/or Competitions also compete at continental and international levels. Almost all of the reviewed Olympiads and Competitions serve as a training ground for subsequent, often foreign Olympiads and Competitions. These follow-up projects add further value and impact.

Absence of or inadequate infrastructural and financial resources always pose a serious threat. Without financial backing, costly activities such as international travel could limit the participation and exposure of youth with talent and potential.

Globalisation exposes South Africa to other challenges. For example, the Francophone-Anglophone language divide is so deep that there was talk of a “Francophone Mathematical Olympiad” funded by France. Such an event has a potential to undermine PAMO. North versus south tensions continue to complicate matters. It is, thus, very important that South Africa support continental Olympiads and Competitions. This type

of outreach should be seen in the context of the African Renaissance and NEPAD initiatives.

AWARDS AND REWARDS

The review of the winners of the Olympiads and Competitions reveal the predominance of learners from privileged and traditionally advantaged backgrounds. This is an area that requires improvement if Olympiads and Competitions are to produce winners who are representative of South Africa's demographics.

In certain instances prizes are awarded in such a way that every participating school is guaranteed to win at least one prize, thus ensuring that prizes are spread across the social spectrum. This is an incentive that needs to be sustained if more schools are to be encouraged to participate in the Olympiads and Competitions. Invitation of top performers to take part in international events also serves as an incentive.

In some cases, it is not only top performers that are recognised for their achievements but all participating learners and schools receive certificates to acknowledge their participation in the event. Awards are also provided to schools with the highest number of entries and to special educators. Such incentives will go a long way towards sustaining schools' participation in the Olympiads, Competitions and Camps.

SYNERGY

In certain instances, there is more than one organising body for Olympiads, Competitions and Camps focusing on the same subject. This duplication merely spreads limited financial and human resources thinner. It is important to ensure that the existence of many STEM Olympiads, Competitions and Camps do not lead to the duplication and dilution of effort. As much as possible, a synergistic impact should be what Olympiads, Competitions and Camps strive to achieve.

Clashes between STEM events can result in a lack of delivery for some events. In addition, learners who have been selected to participate in events occurring at the same time will be negatively affected. This Plan advocates for a systematic approach that is efficiently coordinated to avoid duplication and dilution of effort.

COMMUNICATION AND ADVOCACY

Media coverage of some of the events has not been satisfactory. This limits the events' exposure and needs improvement if the whole of our society is to be aware of the benefits of Olympiads, Competitions and Camps to the school-going youth.

Event coordinators do not have sufficient funds for marketing and profiling their events. Despite the fact that entry fees are charged in some instances, these are not enough to offset the rising administration costs. Effective communication and advocacy strategies are required to profile Olympiads, Competitions and Camps.

OWNERSHIP

The Olympiads and Competitions reviewed are variably owned with higher education institutions playing the predominant role of running them. In addition, there are several Camps being run across the country by a variety of organisers.

The initiatives taken by the mathematics and science professional associations [especially AMESA, SAMS and SAASTE (KZN)] bring much needed support infrastructure. Other events are initiated, resourced and managed by Government Departments (such as the Departments of Minerals and Energy and Science and Technology) and the private sector (Mindset). This National Plan is intended to provide a coherent framework that will promote synergy, coordination and support for these initiatives.

INTELLECTUAL PROPERTY RIGHTS

Competitions and Camps generate a wealth of material and innovative ideas that can easily be turned into commodities for financial gain. Absence of mechanisms through which such products can be legally protected may lead to exploitation.

KEY FOCUS AREAS

In the preceding section, an analysis of the current Olympiads, Competitions and Camps landscape was done. Strengths, weaknesses, opportunities and challenges were highlighted. This section proposes interventions to make Olympiads, Competitions and Camps effective vehicles to identify and nurture the talent and potential desperately needed for the science, engineering and technology sector.

DEFINITION OF OLYMPIADS, COMPETITIONS AND CAMPS

It must be accepted that a fine line exists between Olympiads and Competitions. All Olympiads are competitions but not all Competitions are Olympiads. They both entail a process comprising selection, entry, judgement and awards phases.

For the purpose of this National Plan, the following definitions will apply:

Olympiads refer to all - stand-alone and embedded - competitions that stimulate interest, enhance development of critical skills and motivate learners to excel in demonstrating understanding and application of concepts and skills defined in the formal mathematics, science and technology syllabi/curricula.

Competitions that are not Olympiads broadly refer to all - stand-alone and embedded - activities that provide learners with opportunities to display or exhibit their work, interests and ideas in mathematics, science and technology. All competitions are conducted in a manner that contribute to the development of critical skills to meet the needs of the economy by stimulating interest and encouraging participation and excellent performance in mathematics, science and technology in knowledge areas that go beyond the requirements of the school syllabus/curriculum.

Camps will refer to temporary residential programmes (between 3 and 7 days) for academically talented youth that emphasise critical thinking through problem solving. They will provide opportunities to explore STEM through a selection of exciting and challenging educational demonstrations, presentations, lectures and hands-on activities. Quality career education, life orientation lessons and opportunities for interactive engagement with professionals from the various STEM fields will form core components of the structure of Camps.

PURPOSE

The main purposes of Olympiads, Competitions and Camps are to:

- identify and nurture talent and potential;
- contribute towards the development of critical skills required to improve performance in school science, technology, engineering and mathematics;
- popularise science, technology, engineering and mathematics; and
- create opportunities to develop positive attitudes towards science, technology, engineering and mathematics.

DATA CAPTURING, ANALYSIS AND REPORTING

All Olympiads, Competitions and Camps to be supported by Government will collect data vital to tracking participation and performance. A data collection instrument will be developed to capture information on participants and winners according to disability, age, gender, race, nationality, grade, school, district and province. Data on the tracking system will be used to report progress regarding the implementation of this National Plan.

ELIGIBILITY

All learners from GET and FET bands will be eligible to participate in the first round of Olympiads and Competitions that will occur at school level and will be facilitated by the Department of Education in the identified 30% of schools. In subsequent rounds, entrance fees (in certain instances) and performance (merit) will be used as criteria permitting schools to enrol learners. Special exemption will be given to learners from disadvantaged backgrounds. Procedures used by the Department of Education to exempt parents from paying school fees will be used to determine exemption from paying entrance fees. In addition, charging entry fees for participation in Olympiads, Competitions and Camps will, as far as possible, be compensated for to ensure greater participation by under-privileged learners/schools.

Only those Olympiads and Competitions that operate at all three levels i.e. local, regional and national levels will be considered for support. In terms of Camps, only those that operate at a national² level will be considered for support. The non-national Olympiads, Competitions and Camps are encouraged to continue to seek financial and other forms of support from local Government and communities.

PARTICIPATION

Learners in all the phases of the GET and FET bands will be encouraged to participate in Olympiads, Competitions and Camps. Owing to the focus of Government's strategies on the increased participation and performance of; especially African, disabled and girl learners; more attention will be given to supporting the participation of historically disadvantaged schools and learners. The DoE will, by 2008, ensure effective

² The Constitution of South Africa (1996) defines "national, provincial and local spheres of Government which are distinctive, interdependent and interrelated". The authority of the national sphere is vested in national structures. A national structure comprises provincial representation and functions in terms of nationally agreed upon principles (and those prescribed by the Constitution of South Africa) and plan. National structures negotiate and sign all international agreements as well as approve participation in international events and activities. Thus a national plan, resources permitting, is aimed at being implemented in all provinces while a provincial or local plan may differ and be implemented differently from one province to the other.

participation of at least 30% of South Africa's schools with special emphasis on schools from previously disadvantaged backgrounds. In addition, a whole school development approach will be promoted in determining participation in Olympiads, Competitions and Camps.

The Olympiads and Competitions may include a combination of team and individual events to ensure that even those learners, who may be intimidated by the individual component of the competition, are given the chance to participate, share and learn within a team setting. Issues of gender, disability and race representivity in the constitution of the teams will be encouraged.

Whilst the participation of higher-grade learners will be given precedence, opportunities should be provided for learners taking maths and science on the standard-grade to participate in Olympiads, Competitions and Camps. By these means Olympiads, Competitions and Camps will avoid prejudicing those learners forced to take maths and science on the standard grade as a result of factors such as misinformation and unqualified educators.

SUPPORT

Learners, especially those from disadvantaged backgrounds, who display talent and potential, will be earmarked for participation in Camps, conferences and other relevant STEM events. Financial support will be sought to reduce the negative impact the lack of funding has on planning, implementing learner and educator development programmes, administration, recruitment of new schools into the initiatives and participation in international events.

Incentives will continue to be sought to ensure on-going participation by full-time and part-time educators in recruiting and supporting eligible schools with respect to Olympiads and Competitions.

Steps will be taken to establish mechanisms to sustain and develop books consisting of past Olympiad and Competition tasks and their detailed solutions/designs and commentaries. These books will be designed to enable educators to incorporate past tasks into their lessons without having to reinvent the wheel. In addition, resource materials, which assist learners and educators to prepare for their participation in Olympiads and Competitions, will be provided.

SUPPLEMENTARY TUITION

The DST will facilitate the provision of supplementary tuition and the development of relevant resource materials required to ensure that learners are enabled to effectively participate in Olympiads and Competitions.

CONTENT

The Olympiads and Competitions' tasks/activities will be challenging and motivational. To achieve this objective, they will ensure an appropriate balance between activities requiring (a) knowledge of facts, concepts, skills and (b) their applications. In other words, they will strive to strike a balance between recall and application. The tasks shall be carefully graded from easy to difficult, giving all contestants a feeling of achievement while still maintaining challenging problems to discriminate between learners with different talents and potential.

Steps will be taken to improve representation of individuals from higher education institutions, educators, professional associations and subject specialists on Olympiads, Competitions and Camps structures. This will go a long way towards improving the quality of the content covered in Olympiads, Competitions and Camps.

CAMPS AND EXCURSIONS

Camps may be held each year to select and train teams for Olympiads and Competitions. The problem solving approach of Camps will stand Olympiad and Competition participants in good stead. Other Camps will be held to provide supplementary tuition whilst some will provide learners with stimulating experiences in scientific discovery. In certain instances, Camps together with activities such as excursions will be used to incentivise participation and good performance in STEM.

COMPETITIVE LEVELS

National Olympiads and Competitions will have multiple rounds that take place at local, regional and national levels. Attempts will be made to ensure that winners of national Olympiads and/or Competitions compete at continental and international levels. Steps will also be taken to ensure the demographic representivity of South African teams participating in international Olympiads and Competitions.

South Africa will play a role in establishing South-South partnerships to limit the negative impact of globalisation on developing countries' efforts to nurture talent and potential in STEM.

AWARDS AND REWARDS

Olympiads and Competitions that demonstrate efforts to produce winners who are representative of the demographics of the country will be favoured. The same applies to Camps in terms of the demographics of their participants. Higher Education Institutions will be encouraged to (continue to) play an active role in organising certain events and providing scholarships and early admission for winners/participants who demonstrate talent and potential.

National Olympiads and Competitions that ensure that every participating school is guaranteed to receive recognition, thus ensuring that prizes are spread right across the social spectrum, will be recognised and supported. In other words, all Olympiads and Competitions will be encouraged to provide all participating learners and schools with some form of recognition such as certificates of participation. Attempts will be made to ensure participation of top performers in international events. In terms of Camps, those that support and recognise the voluntary input of educators during the camps will be favoured.

SYNERGY AND COORDINATION

Duplication of effort will be reduced by ensuring synergy and cooperation. As much as possible, attempts will be made to ensure one “pipeline” of Olympiad and Competition winners from local to international competitions. This will avoid unnecessary Olympiads, Competitions and Camps that might arise if many “pipelines” were to be established. Although not preferable at this stage of the development of South Africa’s democracy, it is possible that privately funded Olympiads, Competitions and Camps will continue to organise events outside this National Plan.

Synergy and cooperation between organisers of Olympiads, Competitions and Camps falling within the National Plan will aim to reduce schedule clashes thereby ensuring that learners selected to participate in more than one event are able to participate in all if they choose to.

OWNERSHIP

While Olympiads, Competitions and Camps will continue to be variably owned, Government through the Department of Science and Technology in collaboration with the Department of Education will use this National Plan to coordinate the implementation and support for national Olympiads, Competitions and Camps.

COMMUNICATION AND ADVOCACY

The benefits of Olympiads, Competitions and Camps to the school-going youth's education will be communicated to the public through multiple forms of media (print and electronic) and communication channels such as websites, circulars, publications and conferences. Funds will be raised to market and profile Olympiads, Competitions and Camps. The DST and DoE will identify noteworthy projects developed by learners during Competitions and Camps that can be developed into exhibits for the Network of Science Centres in addition to being profiled at other events.

INTELLECTUAL PROPERTY RIGHTS

The DST will investigate and devise mechanisms through which the intellectual property rights of learners participating in Competitions and Camps may be protected, and how innovative projects can be patented by the learners and/or their schools.

DELIVERABLES

The Youth into Science Strategy mentions that Olympiads, Competitions and Camps have shown their potential to identify and nurture talent and potential in STEM. The Youth into Science Strategy also recognises the historical minority of those who benefited (and continue to benefit) from Olympiads, Competitions and Camps and calls for broadening access to Olympiads, Competitions and Camps by the historically disadvantaged school youth. Performance indicators to measure progress in this regard are described below.

National Olympiads, Competitions and Camps	
Output	Performance Indicators
Increased number of disadvantaged youth benefit from STEM Camps and similar development initiatives	<ul style="list-style-type: none"> ▪ By 2008, 5000 learners would have benefited from the STEM Camps and similar development initiatives ▪ By 2008, there must be a significant increase in the demographic representivity of learners participating in STEM Camps.
Increased number of schools participate in Olympiads and Competitions	<ul style="list-style-type: none"> ▪ By 2008, at least 30% of schools would have participated in Olympiads and Competitions ▪ By 2008, there must be a significant increase in the demographic representivity of learners participating in the final round of Olympiads and Competitions.
Critical skills required to improve performance in school mathematics and science are developed	<ul style="list-style-type: none"> ▪ By 2008, participants of Olympiads, Competitions and Camps would be using critical skills to improve their performance in school mathematics and science
Olympiads, Competitions and Camps are profiled	<ul style="list-style-type: none"> ▪ By 2008, more publicity is given to Olympiads, Competitions and Camps in the media and events such as career exhibitions
Support for Olympiads, Competitions and Camps is increased	<ul style="list-style-type: none"> ▪ By 2008, educators of participating schools are trained to assist their learners to participate in Olympiads and Competitions ▪ By 2008, support materials for Olympiads and Competitions are used in Camps and supplementary tuition programmes ▪ By 2008, funds are raised to double the number of those who participate in Olympiads, Competitions and Camps

IMPLEMENTING AND RESOURCING THE PLAN

Given the magnitude of implementing this National Plan, partnerships with existing Olympiads, Competitions and Camps will be sought to support its delivery. Several initiatives such as agreements signed with the private sector, science councils and agencies will be sustained and strengthened, if not replicated.

In addition to the use of educational institutions such as institutions of higher learning and schools, ways of partnering with Science Centres for the benefit of Olympiads, Competitions and Camps will be explored.

Various avenues such as local and international donors and funders will be explored to raise the resources required to successfully deliver this National Plan.

The Collaboration Agreement signed with the Department of Education will be used as a framework to underpin the implementation of the National Plan. Further inter-governmental collaborations will be pursued to give effect to this National Plan.

The Olympiads, Competitions and Camps Task Team, chaired by the Department of Science and Technology, will coordinate the implementation of the National Plan. The Department of Science and Technology will serve as the umbrella body responsible for the ultimate coordination of South Africa's STEM Olympiads, Competitions and Camps, under the auspices of this Plan.

INFORMATION SOURCES

1. Department of Science and Technology (1996) **White Paper on Science and Technology**. Pretoria
2. Department of Science and Technology (2002) **National Strategy for Research and Development**. Pretoria
3. Department of Science and Technology (2005) **Norms and Standards for a Network of Science Centres**. Pretoria
4. Department of Science and Technology (2005) **Draft Youth into Science Strategy**. Pretoria
5. DOE/DST **Collaboration Agreement**. Pretoria
6. DOE/DST **Collaboration Plan**. Pretoria
7. Eskom Expo for Young Scientists – Mrs Priscilla Moodley
8. ISPAT ISCOR National Science Olympiad - www.saasta.ac.za/sciolympiad/index.shtml and Mr Humprey Netshifhefhe
9. MINTEK Minquiz – Ms Makgodu Tsehloane
10. National Natural Science and Biology Olympiads – SAASTE-KZN and Report on the 1st Olympiads Indaba, 2001 and Mr S Naidoo
11. SAMO – Prof. Nic Heideman, University of Cape Town and SAMO Annual Report 2003 and <http://ridcully.up.ac.za/samo/developmentproject.html>
12. UCT Maths Competition, PAMO and IMO - John Webb, University of Cape Town and www.saasta.ac.za/pamo and www.mth.uct.ac.za

ANNEXURE A
PARTICIPANTS IN THE THINK TANK SESSION
29 JUNE 2005

1. Mr Lebs Mphahlele : DST
2. Ms Nirvashnee Naidoo : DST
3. Ms Koki Selepe : DST
4. Mr Joseph Tshikomba : DST
5. Ms Beverley Damonse : SAASTA
6. Mr Jabu Nukeri : SAASTA
7. Mr Zama Kunene : DoE
8. Ms Dudu Sithole : DoE
9. Ms Zoleka Sokopo : DoE
10. Dr Mathume Bopape : SAMF

ANNEXURE B
DATA COLLECTION TEMPLATE



INFORMATION ON 'ESTABLISHED OLYMPIADS AND COMPETITIONS'

The Department of Science and Technology is currently reviewing 'established' (referring to Maths Olympiads/Competitions that have been in existence for greater than 10 years and Science Olympiads/Competitions that have existed for more than 5 years) Olympiads and Competitions. Consequently, the preliminary review included the following Olympiads and Competitions:

- Eskom Expo for Young Scientists
- UCT Maths Competition
- Mintek Minquiz
- Pan African Mathematics Olympiad
- South African Mathematics Olympiad
- Interprovincial Mathematics Olympiad
- ISPAT ISCOR National Science Olympiad
- National Natural Science and Biology Olympiads

In order to provide a reliable review, accurate statistics on the history, participation and performance of Olympiads and Competitions is required. A simple template has thus been designed to assist you to provide us with information that will enable the Department to analyse and suggest ways of assisting Olympiads and Competitions to identify and nurture talent and potential in mathematics, science and technology. You are therefore, kindly requested to fill in the following tables and return it to Ms Nirvashnee Naidoo at Nirvashnee.naidoo@dst.gov.za by no later than 15 July 2005.

Your organisation will be invited to a workshop during the last week of July 2005 where a draft review of established Olympiads and Competitions will be discussed and strategies for consideration by the Department adopted.

Principles of confidentiality will be adhered to.

Ms Nirvashnee Naidoo

Deputy Director: Science and Youth

Tel: (012) 317 4510

Email: Nirvashnee.naidoo@dst.gov.za

NB: Please attempt to supply as much of the data as possible. Where data is not available for the entire lifespan of the project, please attempt to provide information for at least the last 5 years.

Table 1: General information on specific Olympiads/Competitions

Name of Olympiad/Competition	How long has the Olympiad/Competition been in existence?	State the sources of funding	State whether the event is held at a school district, education region, provincial, national or international level	Does the Olympiad/Competition have disaggregated data on the learners that participate? (if yes, please fill in table 2)	Are there international participants? (if yes, please state from which countries)

Table 2: Disaggregated data on participating learners in specific Olympiads/Competitions

Year	South African Participants						Foreign Participants	
	Total number of learners participating	Number of girls	Number of Black* learners	Number of Black* girls	Number of African learners	Number of African girls	Number and nationality of foreign participants	Number and nationality of foreign girl learners

Table 3: Profile of finalists and winners in final stages of the Olympiad/Competitions

Year	Number of finalists in last stage of the Olympiad/Competition				Winners			
	Total Number of Finalists	Total No. of Girls	Total No. of Black Learners	Total No. of Black Girl Learners	Total No. of Winners	No. of Female Winners	Number of Black Winners	Number of Black Female Winners

Table 4: Data on participating schools in specific Olympiads/Competitions

Year	Total number of schools participating	Province /s with the highest number of participating schools	Total No. of South African Schools			Other Schools
			Ex-White Schools	Ex-Black Schools	Ex-African Schools	e.g. SADC, Continental, International, etc (also state number)

* Black refers historically to Indian, Coloured and African

ANNEXURE C

PARTICIPANTS IN SECOND STEM OLYMPIADS AND COMPETITIONS MEETING, 12 AUGUST 2005

Name	Organisation	Tel.	Fax	E-mail
Bopape, Mathume Dr	SAMF	(012) 392 9324	(012) 392 9312	bopapem@samf.ac.za
Damonse, Beverley Ms	SAASTA	(012) 392 9366	(012) 392 9375	beverley@saaste.ac.za
Engelbrecht, Johann Prof	SAMF	(012) 420 2850	(012) 420 3893	jengelbr@up.ac.za
Heideman, Nic Prof.	SAMO/IMO	(083) 406 0188	(021) 650 2334	heideman@maths.uct.ac.za
Hughes, Colleen Ms	Eskom Expo	(012) 392 9349	(012) 320 7803	chughes@saasta.ac.za
Magi, Thembi Prof	DOE	(012) 312 5466	(012) 321 1716	magi.n@doe.gov.za
Mphahlele, Lebs Mr	DST	(012) 317 4391	086 681 0136	lebs.mphahlele@dst.gov.za
Naidoo, Kanthan Mr	DOE	(012) 312 5073	(012) 312 5073	naidoo.k@doe.gov.za
Naidoo, Nirvashnee Ms	DST	(012) 317 4510	086 681 0147	nirvashnee.naidoo@dst.gov.za
Naidoo, Robin Mr	SAASTE	(032) 943 3051	(032) 943 3051	robinn@webmail.co.za
Naidoo, Viloshni Ms	MINTEK	(011) 709 4914	(011) 709 4253	viloshnin@mintek.co.za
Naidoo, Vishnu Mr	AMESA	(032) 941 5935	(032) 941 5935	buffelvish@telkomsa.net
Netshifhefhe, Humphrey Mr	SAASTA	(012) 392 9391	(012) 320 7803	humphreyn@saasta.ac.za
Nkosi, Aaron Mr	DOE	(012) 312 5685	(012) 312 5463	nkosi.a@doe.gov.za
Olivier, Ellie Ms	SAMF	(012) 392 9323	(012) 392 9312	ellie@samf.ac.za
Ramovha, Isaac Mr	DST	(012) 317 4533	086 681 0186	isaac.ramovha@dst.gov.za
Rijsdijk, Case Mr	SAAO/SAIP	(021) 689 2244	-	particles@mweb.co.za
Selepe, Koki Ms	DST	(012) 317 4492	086 681 0251	koki.selepe@dst.gov.za
Sitole, Dudu Ms	DOE	(012) 312 5663	(012) 324 4484	sitole.m@doe.gov.za
Sokopo, Zoleka Dr	DOE	(012) 312 5128	(012) 325 4001	sokopo.z@doe.gov.za
Tait, Bob Mr	MINTEK	(011) 709 4698	(011) 709 4465	bobt@mintek.co.za
Tsehloane, Makgodu Ms	MINTEK	(011) 709 4280	(011) 709 4326	makgodut@mintek.co.za
Tshikomba, Joseph Mr	DST	(012) 317 4487	086 681 0252	joseph.tshikomba@dst.gov.za
Webb, John Prof	PAMO/IMO	(021) 650 3193	(021) 686 0476	jhwebb@maths.uct.ac.za

ANNEXURE D
DOE/DST COLLABORATION AGREEMENT

COLLABORATION BETWEEN THE DEPARTMENT OF EDUCATION AND THE DEPARTMENT OF SCIENCE AND TECHNOLOGY IN THE IMPLEMENTATION OF THE NATIONAL STRATEGY FOR MATHEMATICS, SCIENCE AND TECHNOLOGY EDUCATION

COLLABORATION AGREEMENT

1. PURPOSE

To outline the collaboration between the Department of Education and the Department of Science and Technology in the implementation of the National Strategy for Mathematics, Science and Technology Education.

2. BACKGROUND

2.1 In November 2003 the Directors General of the Departments of Science and Technology and Education agreed to collaborate on the implementation of the National Strategy for Mathematics, Science and Technology Education.

2.2 On 28 January 2004, Cabinet approved the following eight objectives to consolidate, deepen and widen the National Strategy for Mathematics, Science and Technology Education:

- setting performance targets for all mathematics, science and technology schools, especially African and girl learners;
- placing in every mathematics, science and technology classroom a qualified and competent teacher;
- improving the language of teaching and learning mathematics, science and technology;
- identifying and nurturing talent and potential in mathematics, science and technology ;
- entering into partnerships with relevant stakeholders to raise the required resources and mobilise technical support and expertise;

- evaluation and monitoring of programmes in mathematics, science and technology education;
- making interactive digital content on mathematics, science and technology available via satellite, television, internet, multimedia, print supplements and the educational portal; and
- strengthening the co-operation between the Departments of Science and Technology and Education in delivering the objectives of the Strategy.

3. COLLABORATION BETWEEN THE TWO DEPARTMENTS

3.1 In November 2003, the Departments of Science and Technology and Education agreed on supporting the consolidation, deepening and widening of the National Strategy for Mathematics, Science and Technology Education.

3.2 In order to achieve the above-mentioned objectives, the two Departments will collaborate on the following, focussing on mathematical subjects, physical and life sciences, and computer and engineering subjects in the current and the new curricula:

- a. educator development to upgrade their knowledge and skills;
- b. enhancing learner participation and performance;
- c. identifying and nurturing talent and potential;
- d. placing and supporting learners in higher education and key strategic economic sectors; and
- e. supporting curriculum delivery.

It further agrees to:

- f. conduct research to support the implementation of the National Strategy for Mathematics, Science and Technology Education;
- g. utilise available resources of the two Departments in support of the implementation of the Strategy; and
- h. collaboratively advocate and communicate the objectives of the Strategy.

4. MANAGING THE COLLABORATION

- 4.1 The Department of Education's Schools and Curriculum Innovation Chief Directorate and the Department of Science and Technology's Science Missions and Human Capital Sub-Programme will give effect to the implementation of this collaboration agreement through a joint task team that will develop and oversee implementation.

- 4.2 The Department of Science and Technology will be represented on the Inter-Provincial Task Team that co-ordinates and manages the implementation of the National Strategy for Mathematics, Science and Technology Education.

- 4.3. Planning and reporting will be carried out by the two Departments through normal line functions

Progress reports on the implementation of the National Strategy for Mathematics, Science and Technology Education will be provided to the respective Departments, the Inter-Provincial Task Team and HEDCOM.

Signed by:

.....
Mr T Mseleku: DG – Education

.....
*Dr R Adam: DG – Science and
Technology*

Date: 6 July 2004

Date: 6 July 2004

ANNEXURE E
DOE/DST COLLABORATION PLAN

**DST-DoE COLLABORATION
FINAL DRAFT IMPLEMENTATION PLAN**

This Collaboration Plan spells out activities to be carried collaboratively by the Departments of Education, and Science and Technology in pursuit of the objectives of the National Strategy for Mathematics, Science and Technology Education. It is divided into sections. Section A provides details about activities, lead Department(s) to lead the activities and timeframes while Section B provides broad enabling and enhancing framework create an environment conducive to the successful implementation of the National Strategy for Mathematics, Science and Technology Education.

SECTION A

ACTIVITY	LEAD DEPARTMENT	TIME-FRAMES
1. EDUCATOR DEVELOPMENT		
1.1 Curriculum support		
<input type="checkbox"/> In-service training (non accredited)	DST-DoE	Ongoing
<input type="checkbox"/> South African Astronomical Observatory Environmental Education Programme	DST	Ongoing
<input type="checkbox"/> Mathematical literacy	DoE	Ongoing
1.2 Science Literacy		
<input type="checkbox"/> National Science and Youth Week	DST	Annual(May /June)
<input type="checkbox"/> Science Centres	DST	Ongoing
<input type="checkbox"/> Science Clubs	DST	Ongoing
<input type="checkbox"/> International space Week	DST	Ongoing
<input type="checkbox"/> World Year of Physics	DST	2005
<input type="checkbox"/> Platform Months	DST	Ongoing
1.3 Knowledge and Skills Development		
<input type="checkbox"/> Identification of accredited programmes	DoE	Ongoing
<input type="checkbox"/> Support of accredited programmes	DST	Ongoing
<input type="checkbox"/> Funding (Scholarships & bursaries)	DoE	Ongoing

NATIONAL PLAN FOR STEM OLYMPIADS, COMPETITIONS AND CAMPS

ACTIVITY	LEAD DEPARTMENT	TIME-FRAMES
2. LEARNER PARTICIPATION AND PERFORMANCE		
2.1 Supplementary tuition		
<input type="checkbox"/> Science centres	DST	Ongoing
<input type="checkbox"/> Materials and distribution	DoE	Ongoing
<input type="checkbox"/> School packs	DST-DoE	Ongoing
2.2 Science Literacy		
<input type="checkbox"/> Science centres	DST	Ongoing
<input type="checkbox"/> National Science Week	DST	Annual(May /June)
<input type="checkbox"/> Platform Months	DST	Ongoing
<input type="checkbox"/> Science clubs	DST	Ongoing
<input type="checkbox"/> International Space Week	DST	Annual
<input type="checkbox"/> World Year of Physics	DST	2005
<input type="checkbox"/> Supporting Africa Aerospace and Defence	DoE	Ongoing
<input type="checkbox"/> Energy Week	DST, DoE & DME	September
<input type="checkbox"/> Mining Week	DST, DoE & DME	May
2.3 SET Careers		
<input type="checkbox"/> Science centres	DST	Ongoing
<input type="checkbox"/> National Science Week	DST	Annual(May /June)
<input type="checkbox"/> Platform Months	DST	Ongoing
<input type="checkbox"/> Science & Technology teaching profession	DoE	Ongoing
3. IDENTIFICATION AND NURTURING OF POTENTIAL & TALENT (TO BE A SCIENTIST)		
3.1 Role modelling		

NATIONAL PLAN FOR STEM OLYMPIADS, COMPETITIONS AND CAMPS

ACTIVITY	LEAD DEPARTMENT	TIME-FRAMES
<input type="checkbox"/> Videos	DST-DoE	Ongoing
<input type="checkbox"/> Girl-learner programmes	DST-DoE	Ongoing
<input type="checkbox"/> Motivational speakers	DST-DoE	Ongoing
<input type="checkbox"/> Materials/ brochures	DST-DoE	Ongoing
3.2 Early Tracking and Nurturing		
<input type="checkbox"/> Development of early tracking system	DoE	Ongoing
<input type="checkbox"/> Annual tracking system	DoE	Ongoing
<input type="checkbox"/> Support	DoE	Ongoing
3.3 Youth Camps		
<input type="checkbox"/> Role modelling	DST-DoE	Ongoing
<input type="checkbox"/> Girl-learner programmes	DST-DoE	Ongoing
3.4 Competitions		
<input type="checkbox"/> Eskom Expo for Young Scientists	DST	October
<input type="checkbox"/> Sasol Sci Fest	DST	March
<input type="checkbox"/> South African Mathematics Olympiad	DST	November
<input type="checkbox"/> Science and Mathematics Olympiads	DST	Ongoing
4. PLACING AND SUPPORTING IN SET STUDIES		
4.1 Information		
<input type="checkbox"/> SET career brochures	DST-DoE	Ongoing
<input type="checkbox"/> Science centres	DST-DoE	Ongoing
<input type="checkbox"/> Application for admissions	DoE	Ongoing
<input type="checkbox"/> Bursaries	DoE	Ongoing

NATIONAL PLAN FOR STEM OLYMPIADS, COMPETITIONS AND CAMPS

ACTIVITY	LEAD DEPARTMENT	TIME-FRAMES
4.2 Student Financial Aid Scheme		
<input type="checkbox"/> Bursaries	DST-DoE	Ongoing
<input type="checkbox"/> Sponsors	DST-DoE	Ongoing
<input type="checkbox"/> Scholarships	DST-DoE	Ongoing
<input type="checkbox"/> Funding of youth events	DST-DoE	Ongoing
<input type="checkbox"/> Identification of threatened disciplines	DST	Ongoing
4.3 Academic Support Programme		
<input type="checkbox"/> Girl-learner seminar	DST-DoE	Ongoing
<input type="checkbox"/> Youth camps	DST-DoE	Ongoing
<input type="checkbox"/> Science centres	DST	Ongoing
<input type="checkbox"/> Materials	DST-DoE	Ongoing
<input type="checkbox"/> Role modelling	DST-DoE	Ongoing
5. Language of Learning and Teaching		
Dictionaries	DST	Ongoing

SECTION B

1. RESOURCES

The lead Department will identify fiscal, human and material resources required to implement the collaboration plan

2. RESEARCH

Research on the following areas:

- 2.1 Factors directly related to effective implementation of the National Strategy for Mathematics, Science and Technology Education (NSMSTE).
- 2.2 Establishing the impact of the DST-DoE collaboration on the implementation of the NSMSTE.

3. PARTNERSHIPS

- Suitable partners will be identified for each area of collaboration and/or activity.
- The DoE will facilitate a meeting with the Business Trust.