



ANDHRA PRADESH STATE COUNCIL OF SCIENCE & TECHNOLOGY



21st NATIONAL CHILDREN'S SCIENCE CONGRESS 2013

FOCAL THEME

ENERGY

EXPLORE, HARNESS & CONSERVE

Catalysed & Supported by

NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY COMMUNICATION

Department of Science & Technology (DST)

Govt. of India, New Delhi

National Organiser

NCSTC Network, New Delhi

Organised in Andhra Pradesh by

ANDHRA PRADESH STATE COUNCIL OF SCIENCE & TECHNOLOGY (APCOST)

Department of Environment, Forests, Science & Technology, Govt. of Andhra Pradesh

12th Floor, Gagan Vihar, M.J.Road, Opp. Gandhi Bhavan, Nampally, Hyderabad - 500 001

Phone : 040 - 24619675 Fax : 040 - 24600590

E-mail : secy_apcost@ap.gov.in

In Association with

DEPARTMENT OF SCHOOL EDUCATION &

STATE COUNCIL OF EDUCATIONAL RESEARCH & TRAINING (SCERT)

Govt. of Andhra Pradesh

Er. Y. Nagesh Kumar

Member Secretary, APCOST, Hyderabad &
The State Co-ordinator, NCSC.

Dr. P.V. Subba Rao

Project Director, APCOST, Hyderabad
Cell : 98499 08663

Sri. M. Sambasiva Reddy

Field Officer, APCOST, Hyderabad
Cell : 77029 66993



ENERGY

EXPLORE, HARNESS & CONSERVE

INTRODUCTION & GENERAL GUIDELINES

Andhra Pradesh State Council of Science & Technology (APCOST), Department of Environment, Forests, Science & Technology (EFS&T), Govt. of Andhra Pradesh Coordinates the Science & Technology Developmental Programmes in the State and is the State Coordinator for implementing National Children's Science Congress (NCSC) in Andhra Pradesh State.

National Council for Science & Technology Communication (NCSTC), DST, GoI, conceptualized the NCSC in 1993. NCSC Program is providing a creative channel for the Children of our country. It gives unique opportunity to demonstrate their innovativeness and more particularly, ability to solve any problem for the benefit of society using scientific methods.

APCOST gives priority to NCSC for the benefit of Children of our State and constituted State & District Level Organizing & Academic Committees. The members of committees are drawn from concerned line departments as per NCSTC guidelines viz. School Education, SCERT, Rajiv Vidya Mission, National Green Corps (NGC), AP Residential Educational Institutions, DIETs, various NGOs & local NCSTC Network Members for effective implementation and spread of the activity.

SALIENT FEATURES :

- ▲ Represents a Teamwork of not exceeding five Children & relates directly to community work with definite plans.
- ▲ Forum for formal school going Children including dropouts in the age group of 10 to 17 years age (10 - 14 Lower Age Group & 14+ - 17 Upper Age Group as on December 31 Calendar Year)
- ▲ Involves keen observation on the model field work, data collection, survey, analysis, research & innovativeness based on which simple practical exploration of solutions may emerge for daily life situations.

SCHEDULES OF THE EVENT :

Training to Resource Teachers	: July 2013
District Level Children's Science Congress	: September 2013
State Level Children's Science Congress	: 26-27 October 2013
National Level Children's Science Congress	: 27-31 December 2013
Indian Science Congress	: 3-7 January 2014

GUIDELINES FOR TEACHERS AND PARTICIPANTS :

- ✦ One can choose any innovative project but it should fall under one of the sub-themes
- ✦ Problem should be relevant to the society and the solution should be scientific.
- ✦ Relevance of the project to the school / immediate neighborhood community / village and its impact on target group should be kept in mind.
- ✦ Understanding of the subject, effort of team work, Collection and validation of data, Quality and Quantity of work will be assessed.
- ✦ Originality of the idea, innovation in design and creativity in presenting the problem and also the solution shown is important.
- ✦ The Guide Teachers can guide the student in preparation, presentation of the project. They should fill and submit the registration forms available with the district co-ordinator.
- ✦ They should adhere to the time schedule
- ✦ They can consult the activity guide available with the district co-ordinator with regard to the projects and other guidelines of NCSC.
- ✦ No model is required for the project presentation. Use only Supportive materials like Map, Charts, Photos, Posters etc.

NCSC PROJECTS EVALUATION CRITERIA (DISTRICT LEVEL) :

S.No.	Criteria	Max. Marks	S.No.	Criteria	Max. Marks
1	Originality of Idea & Concept	10	6	Interpretation & Problem solving attempt	10
2	Relevance of the Project to the Theme	10	7	Team Work	10
3	Understanding of the Issue	15	8	Background Correction	10
4	Data Collection & Analysis	15	9	Oral Presentation/ Written report (as applicable)	10
5	Experimentation/ Validation	10		TOTAL	100

NCSC PROJECTS EVALUATION CRITERIA (STATE LEVEL) :

S. No.	Criteria	Max. Marks	S. No.	Criteria	Max. Marks
1	Originality of Idea & Concept	5	6	Interpretation & Problem solving attempt	15
2	Relevance of the Project to the Theme	5	7	Team Work	5
3	Understanding of the Issue	15	8	Follow up Action Plan	10
4	Data Collection & Analysis	15	9	Oral Presentation/ Written report (as applicable)	10
5	Experimentation/ Validation	10	10	Improvement over the previous level as suggested	10
				TOTAL	100

The child scientists are advised to pay attention to the above criteria with regard to the CSC projects.

STRUCTURE OF THE PROJECT REPORT :

The structure of the project report of CSC is as follows:

i) Cover page-must incorporate, a) Title of the project, b) Name and address of Group leader and co-workers, c) Name and address of guide Teacher, ii) Form - A (Registration form), iii) Abstract-in 250 words (one copy in English), iv. Contents - list of chapter with detailed heading and sub-heading, list of tables, charts, maps, etc. along with references against page numbers. v) Introduction- description on background of the study. vi) Aims and objectives of the study. vii) Hypothesis. viii) Need statement. ix) Work plan. x) Methodology. xi) Observations. xii) Data analysis and interpretation. xiii) Results. xiv)Conclusions xv) Solution to the problem. xvi) Future plan. xvii)Acknowledgement xviii)References.

The word limit for the written report for the lower age group is 2500 and that for the upper age group is 3500. The written report can be substantiated by including limited number of photographs, sketches, illustrations and /or drawings, etc.



Er. Y. Nagesh Kumar, Member Secretary, APCOST
with A.P. Delegation at 20th NCSC National Event

Documentation of the work done and the findings of the project are to be reported in the form of a project report. General guidelines on the preparation of project report are as follows.

- ▲ A-4 size paper (i.e. 21 cm x 31 cm) to be used.
- ▲ Registration Form can be obtained from the Guide Teacher / District Co-ordinator. The registration form must be filled in English irrespective of the language of the project report.
- ▲ The report should be in any constitutionally recognised Indian Language.

DOCUMENTS TO BE FURNISHED :

At District Level Event : Filled in Registration form, 3 copies of Project Reports, 2 copies of Abstracts and 3 copies of Colour passport size photos of Project Leader and Guide Teacher are required to be furnished.

At State Level Event : Filled in Registration form, 3 copies of Project Reports, 3 copies of Abstracts, 10 copies of Colour passport size photos of Project Leader and 3 copies of Colour passport size photos of Guide Teacher are required to be furnished.

PRESENTATION OF PROJECTS :

The Project Leader of the NCSC project is required to make a presentation about the project before the Evaluators at the District Level event. Selected Project Leaders shall be eligible for making the presentation at State Level and National Level events. Posters (limited to 4) are allowed for display and explanation purpose during the presentation of the projects. Presentation time given for the project leaders is up to 8 minutes. It is suggested that the Project Leader should be able to explain the details of the project in a neat and legible manner.

Communication skills play an important role in the oral presentation of the project. The other members of the project group should also possess equal understanding of the project along with the project leader.

FOCAL THEME AND SUB-THEMES

FOCAL THEME : ENERGY : EXPLORE, HARNESS AND CONSERVE

Energy is considered as crucial input parameter for our day-to-day work and for economic development of any country. Per capita energy consumption is one of the key deciding factors of the level of well-being of any society.

In reality, economic development of every region or country largely depends on how its energy requirement is satisfied. Every production process has certain amount of energy requirement. Hence, availability of quality energy sources is crucial for overall scientific and technological progress of any country.

Energy is central to sustainable development and poverty reduction efforts. It affects all aspects of development – social, economic and environmental – including livelihoods, access to water, agricultural productivity, health, population levels, education and gender-related issues. None of the millennium development goals can be met without major improvement in the quality and quantity of energy services in developing countries.

In this era, when we are facing challenges due to climate change globally, efficient energy use and replacement of carbon based fuel with non-carbon based fuel are the key areas by which we can reduce our carbon footprint to a large extent and undertake some pragmatic measures for mitigation and adaptation of climate change. It is noteworthy that awareness and understanding in such areas in many cases encourage us for taking self initiatives for conservations, rational uses and strategies for enhancing efficiency. Therefore,

rational uses and strategies for enhancing efficiency. Therefore, "Energy : Explore, Harness and Conserve" has been proposed as the focal theme for the CSC 2013 also with an expectation that the young minds will be able to realize the need, take different initiatives to explore and identify the energy resources and find ways to harness it, identify approaches to achieve optimum use through enhancing energy efficiency and energy conservation along with creating awareness among the masses through their project work.

SUB-THEMES:

I. Energy Resources

The growth and development of an area or locality or the country depends upon the availability, accessibility, potentiality, stock and present requirement of Energy Resources. This sub-theme deals with the different aspects of Energy Resources available as well as the potential sources available for the development of the area with emphasis on the ways and means to tap the different potential sources. The different sources of energy available can be divided into two major categories: Renewable Sources and Non-renewable Sources of Energy. The different Renewable Sources of Energy are Solar – Thermal and Photovoltaic, Hydro – Electricity, Wind Energy, Bio-mass (like Firewood, Agricultural Waste, other Bio-Fuels, etc.) and combination of Bio-energy sources Bio-ethanol and Bio-Diesel. The different Non-Renewable Sources of Energy are Coal and Lignite, Oil, Natural Gas and Nuclear Energy.

Some project ideas:

- ▲ Explore and identify energy resources in and around you;
- ▲ Nature of availability of solar energy in your village or locality;
- ▲ Study on biomass resource potential in your village or locality;
- ▲ Assessment of potentiality of hydro power in a flowing stream;
- ▲ Wind mapping; etc.

II Energy Systems

The term energy systems, here refers to the interrelated network of energy sources, conversion of energy sources, transmission and distribution of that energy to where it is needed to perform the work. The sub-theme here mainly focuses on developing devices to convert from one form of energy to another useable form, performance analysis and thus the feasibility and appropriateness.

Some project ideas:

- ▲ Evaluate the energy efficiency of different chullahs used in a village;
- ▲ Comparison of Food web of two different natural ecosystems in an area;
- ▲ Maximum power output from a solar module at different solar radiation and at different inclination angle;
- ▲ Making various types of concentrating type solar cooker and measurement of temperature at the focal point at different solar radiation throughout the day;
- ▲ Making of box type solar cooker by using various available materials like ply-board and measurement of cooking time for various kinds of food;
- ▲ Measurement of amount of gas output from different kinds of organic waste materials (cow dung, vegetable waste, food waste, municipal solid waste etc.) during anaerobic digestion;

III. Energy and Society

Growth in any sector like Agriculture, Industry, Housing, Transportation, Health Care, Education, Tourism, Entertainment, Communication, etc. presupposes corresponding growth in energy sector. In other words, availability and accessibility to different energy resources many a time influences the societal pattern of an area. Societal make-up and structure also exerts impact on the energy

consumption status and pattern. Both these processes determine many of the parameters which are linked with societal benefits, security/well-being of human life. This sub-theme focuses on such societal dimension of energy use to cater to our needs of day to day life.

Some project ideas:

- ▲ Gender-wise energy consumption pattern;
- ▲ Change in the pattern of energy consumption and impact on lifestyle and society;
- ▲ Energy spent to stay fit;
- ▲ Energy for basic needs and livelihood;
- ▲ Availability of bio-resources and efficient uses in the kitchen;
- ▲ Energy implications of dietary habits;
- ▲ Change in pattern of energy consumption due to festivals – impact on society;
- ▲ Change in energy flow due to shift in agricultural practices (crop, cattle, fertilizer use);
- ▲ Common facilities for reducing energy input in various sector, etc.

IV. Energy and Environment

The production or the use of energy especially the non-renewable sources had always laid a great impact on the environment. Whether it is at the time of production, processing, consumption or even transmission, it has great impact, whereas it is an inseparable part of the growth and development. In this area one can assess the environmental impacts of different processes of production, transmission/transportation and uses of energy in and around us.

Some project ideas:

- ▲ Environmental impact of Power Plants;
- ▲ The impact of deposition of suspended particles on photosynthesis;
- ▲ Use of bio-resources as fuel in the kitchen and the impacts on health of women;
- ▲ Automobile pollution – impact on human health;
- ▲ Insects congregating around lights and probable impact on its population;
- ▲ Impact of wind generators on birds and other animals;
- ▲ Environmental impact of mining and exploration activities for energy resources;
- ▲ Energy consumption in the brick industries;
- ▲ Fire wood collection and probable impact on forest and biodiversity; etc.

V. Energy Management and Conservation

The management of energy deals with the different sources of Energy, assessing the present demand and optimal requirement with identification of the causes of misuse or wastage. It may be due to negligence, wrong practices and factors such as aging of the machinery, transmission loss, or any such cause which poses hindrance in delivering the maximum energy spent at the input. In order to meet the loss of energy, steps such as Strategies for minimizing these losses, Strategies of techniques/set-up, change in management approach and practices are usually taken as conservation measure.

Some project ideas:

Dr. A.P.J. Abdul Kalam, Former President of India & other dignitaries at the Inaugural Event of 20th NCSC National Event.



- ▲ Energy audit of school electricity usage;
- ▲ Understanding green building;
- ▲ Role of renewable energy in disaster management;
- ▲ School water audit to assess the impact of water uses on energy consumption;
- ▲ Assessing energy consumption pattern for preparation of food in the school;
- ▲ Recycling practices and its impact on energy consumption;
- ▲ Energy audit at a hospital;
- ▲ Energy conservation in a village household;
- ▲ Energy accounting for a solar green house;
- ▲ Energy accounting of village industries/micro-enterprises/market complex;
- ▲ Effectiveness of solar passive measures;
- ▲ Comparison of energy utilization of different crops;
- ▲ Energy accounting of a specific crop from tillage to harvesting; etc.

VI. Energy Planning and Modeling

The term planning of energy here refers to means for creating self sufficiency in energy with strategy for optimum use and achieving its security. This involves assessing the present demand and supply situation with reference to assessing the stock and identifying ways and means for optimizing the utilization. This is achieved through reviewing the consumption pattern, Projecting future demand and supply and Comparing situation with the help of models. The modeling shall help in identification of ways & means in attaining sufficiency and energy security.

Some project ideas:

- ▲ Micro-level energy planning and modeling – start from your school;
- ▲ Planning for energy – efficient buildings;
- ▲ Modeling grey water recycling in a colony;
- ▲ Energy planning for transport sector;
- ▲ Modeling for water utilization of a particular society/area;
- ▲ Assessing present energy usage and projection for future requirement for your village or locality;
- ▲ Modeling of windows for optimal utilization of energy;
- ▲ Modeling of home/office interiors for efficient power consumption;
- ▲ Modeling of energy efficient cooking systems;
- ▲ Modeling of energy self-sufficient locality/village/school;
- ▲ To plan and model the change in school timings for reducing the energy requirements; etc.

For Details Please Contact:

APCOST Regional Officers

S.No.	Name, Designation Cell Phone No.	Region	Districts
1	Sri Ch. Hemanth Kumar Project Officer 98499 08669	Hyderabad	Hyderabad, Ranga Reddy, Nalgonda, Medak, Mahaboobnagar
2	Sri J. Dhilleswara Rao Field Officer 98499 08668	Vijayawada	Krishna, West Godavari, Guntur, Khammam, Prakasam
3	Sri M. Sambasiva Reddy Field Officer 77029 66993	Visakhapatnam	Srikakulam, Vizianagaram, Visakhapatnam, East Godavari
4	Sri S. Srinivas Field Officer 98499 08675	Warangal	Warangal, Karimnagar, Adilabad, Nizamabad
5	Sri P. Srinivas Programmer-cum-FO 98499 08676	Kadapa	Chittoor, Anantapur, YSR, SPSR Nellore, Kurnool

21st National Children's Science Congress District Coordinators

Adilabad	SRI U. PRAMOD KUMAR School Assistant Cell: 94401 40975	H.No. 1-2-312, Shanthinagar, Adilabad-504 001 e-mail: unnamatla94@gmail.com
Anantapur	Sri K. RAGHAVIAH MEO Ph: 94408 72073 08554-272339	H.No. 6-5-719-1 Sri Nagar Colony ANANTAPUR. PIN : 515 001 e-mail : raghavaiah.dsm.atp@gmail.com
Chittoor	Sri K.VENKATESWARA RAJU Graduate Assistant Cell: 99635 64768 Phone : 0877 – 2248015 (O)	S.V. University Campus School, Balaji Colony, Tirupati, Chittoor District. PIN : 517 502 e-mail : kvvmbi-rajua@yahoo.com
East Godavari	Sri G.VASANTHA KUMAR School Assistant Cell: 99492 82342	D.No.32-9-3, Lalithanagar, Ramachandra Puram – 533 255 East Godavari District. e-mail : gvasanthakumar1960@gmail.com
Guntur	Sri A.A.MADHU KUMAR School Assistant Cell : 90328 71234	Flat No. 404, Venkat Sai Towers, Janda Chettu Bazar, 60 Feet Road, Narasarao Pet, Guntur Dist.-522 601. e-mail: madhukumaraa@gmail.com
Hyderabad	Sri G. PRABHAKAR District Science Officer Cell: 92462 73583	Keshav Memorial High School, Narayana Guda, Hyderabad e-mail : prabhaker_gandhari@yahoo.com
Karimnagar	Sri S.NAGESWARA RAO Head Master Cell: 93951 12049	H.No.7-1-295, Opp. Balaji Sawmill, Behind SBH, Mankamma Thota Karimnagar – 505 001 e-mail : ssnnar278@gmail.com
Khammam	Sri S. CHALAPATHI RAJU School Assistant Cell : 94922 44755, 92472 96012	D.No. 11-53, Seshagiri Nagar Kothagudem. PIN : 507 101, Khammam District e-mail : saraswathi.chanti@gmail.com
Krishna	SRI CH. YESU DSS, School Assistant Cell: 94404 84450	D.No. 30/72-7A, Malkapatnam, Machilipatnam - 521 001.
Kurnool	SRI G.JAYACHANDRA REDDY Head Master Gr. II Cell: 98496 59339	H.No. 78-110, Krishnanagar, B.Camp Post, Kurnool - 518 002. gadekarijayachandrareddy@gmail.com
Mahaboobnagar	Sri V. RAJASEKHARA CHARY School Assistant Cell: 98485 34557	Plot No. 18, Kranti Nagar, Beside Ayodhya Nagar Christian Palli, Mahaboobnagar-509 001 e-mail : rajasekharv1967@gmail.com
Medak	Sri H. VIJAYA KUMAR School Assistant Cell: 99634 23691	H.No. 11-190 (old), Shanti Nagar Colony, Near Hanuman Temple, Patancheru, Medak District. PIN : 502 319, e-mail : vijayhatty@gmail.com
Nalgonda	Sri B. VENKATA RAMA NARSAIAH School Assistant, Cell: 97055 84636	H.No. 6-7-377/2, Siva Rama Nagar NALGONDA. PIN : 508 001
Nizamabad	Sri N.RAMA RAO Alternative Schooling Coordinator Cell: 90002 01541, 98662 99828	H.No.6-35, Arya Nagar, Boregaon (P), Nizamabad District. PIN : 503 320 e-mail : narraramarao@yahoo.com
Prakasam	Sri M.SRINIVASULU School Assistant Cell : 94901 74988	Govt. High School(Boys), Podili Post & Mandal, Prakasam District PIN:523 246 e-mail : udayagiri.reddy@gmail.com
Rangareddy	Sri S.N.REDDY Principal Phone : 040 – 20005047 , 6544 6388 Cell: 99635 46666	Chaitanya Residential High School Opp: Uppal Bus Depot, Road No.5 Ashok Nagar Colony, Boduppal, Hyderabad-500 039 e-mail : crhs1997@gmail.com
SPSR Nellore	Sri A.V.Sudhakar, School Assistant Cell: 99516 86894	H.No. 25-2/493, Chaitanyapuri, A.K.Nagar, Vedayapalem, Nellore-524004, SPSR Nellore District. e-mail: sudhakar.athivaram@gmail.com
Srikakulam	Sri P.KRISHNA PRASAD Head Master Cell: 92478 42117	D.No.14-1-316, Srinivasa Nagar, Kasibugga Srikakulam Dist. PIN : 532 222 e-mail : krishnaprasad.apcost@gmail.com
Visakhapatnam	Sri. A. S. NAIDU School Assistant Cell: 94407 45016	H.No. 39-21-28/1, Vidyanagar Madhavadhara, Visakhapatnam - 530 007 e-mail : asnaidu27@gmail.com
Vizianagaram	Sri N.A.NARASIMHAM School Assistant Cell: 94943 33915	Flat No. 306, Aiswarya Residency, Baba Mitta Near Rythu Bazar, Vizianagaram. -535 002. e-mail : focusvzm@gmail.com
Warangal	Sri K. SANDEEP KUMAR School Assistant Cell: 98855 66742	H.No. 2-9-48, Vikas Nagar, Hanamkonda Warangal District. PIN : 506 001 e-mail : sandeepkunduru@yahoo.co.in
West Godavari	Sri M. UMA MAHESWARAM School Assistant Cell: 99485 82712. Ph: 08816 223775	Z.P.High School, China Amiram Village, Bhimavaram Mandal, West Godavari District. e-mail : uma2563@gmail.com
Y.S.R.	Sri D.V.SUBBA NAIDU School Assistant Cell: 87905 64408	Z.P.High School, Lekkalavari Palli, Ganjikunta Post, Mydukur Mandal, Y.S.R. District.- 516 173, e-mail : dvsubbanaidu@gmail.com