India is believed to have the second largest education system in the world (after China) which encompasses infrastructure for science education as well. This includes over a hundred thousand schools, over 8,600 colleges, more than 200 universities, and several specialised learning institutes like The Indian Institute of Technology(IIT), Indian Institute of Science(IISc), and a chain of 40 laboratories of the Council of Scientific and Industrial Research (CSIR) with an equal number of laboratories under the Defence Research and Development Organisation (DRDO). For school education, the National Council of Education Research and Training (NCERT), created in 1960s, is the key player for all aspects of science education including policy formulation and implementation. To fulfil the constitutional mandate of free and universal education for children aged 6-14, two national policy statements on Education, of 1968 and 1986 (the latter revised 1992), emphasised this goal. In recent years, there has been more emphasis on implementing universal elementary education to improve the overall literacy rate through schemes as Sarva Siksha Abiyan (SSA), District Primary Education Programme (DPEP), and Operation Black Board. As a result a literacy rate of 74% (85% among men and 65% among women) has been achieved (Census 2011), through there is wide variation in the literacy rates of different States. The good news is that the primary enrolment rate is now close to universal.

However, attendance and retention in primary enrolment in secondary schools is not very encouraging, and there is also the issue of learning outcome and teacher absenteeism, growing disparity in quality education opportunities also due to massive growth of private schools. This deteriorating standard of education has led to parents withdrawing their wards from government schools and enrolling them in private English medium schools instead; which seemingly promises a better quality of education even in rural India. The National focus Group on Teaching of Science (NCERT) also observes a huge gap in education in general and science education in particular between rural and urban students.

If we compare India’s adult and youth literacy with our neighbours and BRICS group (Brazil, Russian federation, India, China, South-Africa) countries, our achievements are fairly good as compared to Bangladesh and Pakistan, but we are substantially behind other BRIC countries and Sri Lanka. In India 96.5% children were enrolled in primary schools in 2011 (ASER Survey, Pratham 2012), but India is at a disadvantage with respect to all other BRIC countries, where secondary enrolment rates are far better. Fortunately, as per the Indian Science Report 2006, there has been a substantial increase in the enrolment of students for science education at secondary level, but it is not translated into the enrolment at undergraduate level, which is a worrisome trend.

Despite all this, the Indian economy has had a spectacular growth over the years, but it would be difficult to sustain this growth without developing human resource at a matching pace in various fields. Notwithstanding the huge annual output of scientific and technical manpower in the country, there

No great discovery is ever made without a bold guess.  

Isaac Newton
is a yawning gap between supply and demand in terms of quality.

Studies across the world have shown that there is an overall decline of interest among students in science as such, and enrolment in basic science course in higher education in particular, with engineering as an exception. The question arises: Why is this happening? A few possible answers could be: a career in science is not perceived attractive either by parents or students, as employment opportunities are better for commerce and economics due to globalisation and liberalisation of economy. But we need to realise the fact that whatever benefits of technological revolution we are enjoying today is the result of basic research done about 20 to 30 years ago. And to sustain the ongoing technological revolution, we need a strong foundation in science education at the school level for a constant supply of trained manpower.

We all will agree with the fact that the objective of education, particularly science education, is to develop inventiveness and creativity along with competence. Unfortunately, science education in India at its best helps develop competence, but seldom encourages inventiveness and creativity. This is supported by the fact that many students do well in formal scholastic tests, but fail to convert it into outstanding research or original thinking because our present education system is dominated by content-based learning examination system.

Indian has a long and chequered history of education and training in pure and applied sciences dating back to over 2,600 years. For example, in the University of Taxila (now in Pakistan) major fields of study were mathematics, astronomy, medicine, surgery and metallurgy, attracting students from across the world. Unfortunately the glorious tradition of original thinking and creative inventiveness was completely lost in the medieval period. If we take a cursory look at history of the colonial period, we can clearly see three distinct phases in science education in India, viz., 1792-1813, 1814-1835, and 1836-1857. During the first phase the British avoided any interference in matters of education. Only a few individuals involved in scientific surveys were often introduced to some rudiments of mathematical education. In the second phase, the teaching of oriental science and literature was introduced with the purpose of serving the British and the aim was to train Indian students to become specialist and naturalists for executing public-works plans and locate and assess the natural resource of the country. Accordingly, modern medical and engineering colleges appeared on the scene. At the same time chairs of natural philosophy, natural history and geology were granted for a few metropolitan colleges. In fact that was the beginning of modern science education in India.

It was only in 1857 that the universities of Bombay, Calcutta and Madras, modelled after London University, were established. To accommodate Indian aspirations the foundation for basic sciences were expanded and academic sciences in universities received a fillip. School education also followed the model setup by the colonials. The idea that all children have access to schooling was still a distant dream. However the practice of science during 1900-1947 acquired a nationalistic hue. Despite adverse conditions, globally competitive scientific research was carried out by such scientists as Raman, Saha, Bose, P.C. Ray, and Biral Sahni. All of them were trained in India and carried out their research in Indian universities. In fact it was the period when Indian science appeared on the world map, although under the flag of the colonials. However, the outbreak of World War I brought about a radical change in science education, research and technological developments to meet the war time needs.

With independence came the Nehru’s model of economic development and social transformation that gave prominence to science and technology. Accordingly, science education also received well-deserved attention. Scientist became the pilots of new India and there was an understandable desire to develop more and better scientists. This perhaps explains the direction school science education took in India after independence.

The development of modern education, however, was not an organic extinction of earlier Indian traditions. (It was an implant that was alien to its people.) It would not be incorrect to say that the pattern of science education was heavily influenced by the incidents that took place in European nations and the USA.

It is surprising that science in school curriculum did not find any important place in the beginning of twentieth century. Education of science was imparted only at the university level. It was in 1953 that it was made compulsory to include science as an independent subject in school curriculum. If we look at the evolution of school science education in India, a clear trend of including more and more content overwhelmingly in the form of factual
information in the syllabus is seen. The factual information that dominates the syllabus is not supported by the kind of activity, which can make it comprehensible to students. As a result, students are left with no option except memorise the facts. The consequence of this is that students find science not only difficult but also boring and unrelated with their daily life. Perhaps, this may be one of the most important reasons for students not opting for science at the XI plus and undergraduate level.

Policy experts are well aware of the facts mentioned above and from time to time many corrective measures have been suggested and taken. For example, till mid-seventies, a discipline-wise approach for teaching science was recommended (Indian Education Commission setup in 1964). There were separate text book for physics, chemistry and biology. Later, science was considered as part of environment studies at the primary level and as composite subject at upper primary and secondary stage. In 1986, the National Policy on Education considered, for the first time, the teaching of science at thesecondary stage as a single subject, rather than three separate disciplines. However, science education continued to be loaded with content and factual information. This is justified by citing the information explosion and the necessity to catch up with the world. Any change or dilution, it is said, will adversely affect India’s competitiveness at the world level. In such a confused scenario, the overall objective of education, mainly science education, has been lost sight of, and has taken a back seat. The text books and syllabi of the last 40 years clearly suggest that the aim of school science education is to produce scientists. Hence the syllabi are dominated by demands of different branches of science, and therefore, there is relentless pressure to cover more content in the lower classes.

Children are naturally observant and curious and love observing and exploring the world around them. Indeed this is what science is all about. These are the very traits which need to be nurtured by science taught in schools. There are only a few exceptions, which challenge the orthodoxy of Indian science education, i.e., the Hoshangabad Science Teaching Programme (1972) and Indian National Children Science Congress(1993). These are unique programmes in that they emphasise the process of science (observation, recording performing experiments, etc.) unlike the products of science, e.g., laws and theories. Unfortunately, the Hoshangabad Science Teaching Programme was discontinued in 2002.

However, the Indian academia and policy-making bodies have been expressing great concern about the declining interest in basic science education and several new programmes like INSPIRE by the Department of Science and Technology, Govt. of India, and other schemes are launched. The NCERT, in its National Curriculum Framework Document 2005, also addresses the issue and acknowledges the product obsession in school science education for the first time. The Hoshangabad Science Teaching Programme and other similar efforts have also found place in a major policy document. It would be a beginning towards a curriculum that is less laden with facts, weak in disciplinary boundaries and links school knowledge with outside knowledge. In addition, the re-structuring of the education base also provided significant scope for joy of learning, inventiveness, and creativity. In this context, the non-formal mode of education would also assume significance, wherein children could undertake investigative projects through a suitable platform like science clubs at school with some minimal facilities. Indeed a variety of innovative software, teaching/learning packages and activity kits have been developed by several government and non-government organisations. Science clubs could be affiliated to existing network of science clubs like VIPNET and could even play a major role in science popularisation among the general public.

At present what we need is a new perspective to science education in school, which not only encourages competence but also inventiveness and creativeness besides exposing children to the thrill, excitement and challenges of science. Even if all the learners do not study science at a later stage, in order to become effective citizens they need to possess the skill and competencies for understanding and use S&T in their daily life. This would help our country transform into a nation of people who are scientifically literate and attitudinally rational to take informed decisions, especially on issues like GMO, nanotechnology, nuclear energy, polluting industries, stem cells, climate change, global warming, etc., which now have a direct bearing on our everyday lives.

Reference:
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छठ ऊर्जा विकल्प नानोकीय ऊर्जा की आवश्यकता
नानोकीय ऊर्जा पर जन-जागरूकता अभियान

नानोकीय ऊर्जा पर जन-भाषियता

फूली भाषात यह है कि नानोकीय विकिस्टर्स से नानोकीय हिंदीवर्तन का उपयोग होता है। यह व्यक्ति मिलानेबाद है। परमाणु बम बनाने वाले लोग पांच देश नानोकीय ऊर्जा से विद्युत पूर्वाञ्चल शून्य करने में बुझकर ही परमाणु बम का निर्माण कर सकते थे। यह उसकी रूप में हम कर सकते हैं कि परमाणु बम बनाने के लिए पहले परमाणु रियर्टर का निर्माण करना आवश्यक नहीं है। जवविषय का विपरीत समस्या घटना का बढ़ता तात्पर्य है। इस पर विश्वासों के आवश्यकता है कि किसी नहीं नानोकीय रुपरेट के दौरान विकास में उत्साहित होने वाली हानिकारक पैसे चिन्ता का विवेक बनी हुई हो।

दूसरी बड़ी भाषा प्रति यह है कि परमाणु विजिलेटर एक बम की तरह है और किसी वही दुर्भाग्य की विविधता में इससे विकास की वातावरण मात्रा उपयोग होती है। ये जब श्रीमाहल्ल आइल्ड और चेलिकन में हुई दुर्भाग्यों से संबंधित है। वर्ष 2011 में जापान द्वारा उल्लिखित में जुड़ी समस्या के रूप में हुई दुर्भाग्यों भी लोगों में वेंज़ह इंटर का वातावरण बना रही है। इस दुर्भाग्यों से छोड़ने के बजाय इसके विषय में जापान आवश्यक है।

श्रीमाहल्ल आइल्ड के विषय में सच्चाई यह है कि इससे आग-ज्यादा के स्तर पर कोई विभिन्न प्रभाव नहीं पड़ा था। ब्रिक्क मक्खली के वायुपुंश रिफ्लेक्ट तो मंगल सत्र पैदे पर इससे नियंत्रण का प्रभाव जनता क्षीण था कि इससे हमारा प्रकृतिक्षण नुकसान प्रभावित नहीं हुआ। श्रीमाहल्ल आइल्ड दुर्भाग्य वर्ष 1979 में अमेरिका के श्रीमाहल्ल आइल्ड न्यूजवियर विभुति संचार की इकाई-2 में शीर्षक प्रणाली के काम न करने के कारण कॉर
5-

6-

7-
2-न्यूक्लियर एनजी: सम इंटरस्टेज फैक्टर्स

यह पुस्तक भी श्री विवाह वायू द्वारा लिखी गई है। नामिकीय ऊर्जा के विषय में हमारे नागरिकों को सीमित जानने के लिए इस पुस्तक में हम यहाँ अंकीय का समय निकालने के लिए इस प्रश्न का उत्तर देते हैं, जिसमें कि हम इस विषय पर गलत जानकारी दे रहे हैं।

3-परमाणु ऊर्जा स्वच्छ ऊर्जा

ऊर्जा की कमी से तो सभी पीड़ित होते हैं, पर ऊर्जा के स्रोतों का पता ही होता हैं। इन स्रोतों से ऊर्जा प्राप्त होती है और उससे बिजली और जलमल में बदलती है। जीवित होता है और विवाह वायू की जीवन जीवन होता है। इस प्रकार दो स्रोतों का समय बदलता है और तो आप अधिक ऊर्जा रहते हैं। इसी सब बातों की समस्या के लिए नागरिकों को बदलने का समय बनाया है।

4-बाजीगर आइसोटोप

श्री योगी द्वारा लिखित अगली पुस्तक है बाजीगर आइसोटोप। इस पुस्तक में आइसोटोप को बाजीगर के जानने पाठकों को मिलता है। आज के बुध में आइसोटोप का महत्व बहुत बढ़ा है। यह पुस्तक दी प्रस्तुति अथवा अनुशासनों के बारे में है। इस पुस्तक में प्राचीन समय से पहले तक, तथा आधुनिक समय के बारे में जानकारी मिलती है।
A series of training programmes are being organised on different themes for the coordinators of VIPNET clubs for the Southern zones as follows:-

1. “Managing Disasters” and ‘Model Rocketry’ for the Southern Zone (For VIPNET clubs from the States of Andhra Pradesh, Karnataka, Kerala, Tamilnadu, Puducherry). The programme are being organized jointly by NCSTC, Vigyan Prasar and Tamilnadu S&T Centre, Chennai.

For each training programme about 50-60 participants will be selected on the basis of nomination as per the prescribed format. The programme will be organized in the month of May-June 2014. Kindly send us your nomination to so as to reach VP by 30 April, 2014. The selected participant will be informed individually about the exact dates and venue of the programme.

You can send your nomination by E-mail also.

Desk, VIPNET (Regional Training Programme for VIPNET Clubs), Vigyan Prasar, A- 50, Institutional Area, Sector - 62, Noida - 201 309, U.P. or E-mail: - info@vigyanprasar.gov.in

**REGIONAL TRAINING PROGRAMME FOR VIPNET CLUBS FOR SOUTHERN STATES**

**NOMINATION FOR PARTICIPATION**

1. Name of the participant: ...........................................................................................................

2. Name of the Club : ..............................................................................................................

3. Date of Birth : .................. Sex : ..............................................................

4. With in School ☐ Outside in School ☐

5. Unique Authorization number issued by Vigyan Prasar: ..............................................

6. Address:(Office) ..................................................................................................................

..................................................................................................................................................

(Residence )..........................................................................................................................

..................................................................................................................................................

7. Phone No : .........................................................................................................................

8. E-mail : ..............................................................................................................................

9. Have you ever attended any training programme organised by Vigyan Prasar if Yes, please mention the details.

10. Please mention how you will utilize the acquired skill for the benefit of your club members?

11. Please mention 10 activities of your club undertaken in last one year.

12. If you are a working teacher, kindly give your school address, with phone/fax number and your nomination should be endorsed by School Principal.
Dr. T. Ramasami receives Padma Bhushan

Thirumalachari Ramasami (commonly known as T. Ramasami), a highly accomplished researcher and leather scientist, has been awarded Padma Bhushan, India’s second highest Civilian Honour for excellence in science and engineering. He was earlier awarded Padma Shri (2001).

Ramasami obtained his Secondary School Leaving Certificate (SSLC) from G.S. Hindu High School, Chennai, in 1963, Pre-University degree from St. Joseph’s College, Trichy (1964), BTech (1969) and MTech (1972) degrees in leather technology from the Madras University. He topped in both the BTech and MTech examinations. He got his PhD degree in chemistry from the University of Leeds, England in 1976. His PhD thesis was on the chemistry of chromium. He worked at the Ames Laboratory, Iowa State University, USA (1978-80), Wayne State University, Detroit, USA (1981-83) and University of Newcastle upon Tyne (1983-84) on research areas relating to homogeneous catalysis, electron transport phenomena, and bioorganic chemistry, respectively.

In 1984, Ramasami joined the Central Leather Research Institute (CLRI), a research laboratory of the Council of Scientific and Industrial Research (CSIR), located in Chennai. The CLRI is the world’s largest leather research institute. He became Director of CLRI in 1996 and served in this post till 2006. Under his leadership CLRI emerged as the global leader in leather research and development by way of original publications, IPR generation and technologies delivered. He prepared a vision document for CLRI—”CLRI Vision 2005” and directed the Leather Technology Mission with 170 projects in 17 states of India. One of his outstanding achievements as Director of CLRI was that the Institute provided cleaner tanning technology options for a group of 764 tanneries in record time of 12 months. His contributions to the solution of environmental problems in leather sector in Tamil Nadu resulted in saving 2,50,000 jobs and an annual turnover of Rs. 6,00,000 crores.

Ramasami’s own research investigations focussed on mechanistic chemistry, industrial applications of chromium salts and “Do-ecology solutions” to industrial environment problems. Among his major research contributions are demonstration of anomalous reactivity of chromium (III), stabilisation of unusual oxidation states of chromium, mechanistic insight into chromium induced apoptosis of human lymphocytes, understanding host-guest interactions in biomolecular systems, and development of technologies for improved tanning salts and systems for leather sector.

At least twelve technologies developed by Ramasami and his group are in commercial exploitation and many of these technologies were developed from first principle without international equivalent. Ramasami holds 37 patents including the 12 which have been commercialised. He has authored more than 220 research papers, many chapters in books, and numerous general articles. He has guided more than 30 students for their doctoral research.

In 2006, he became the Secretary of the Department of Science and Technology (DST), Government of India. As Secretary, DST, he has initiated policies, programmes and schemes with potentials for long-term impact. Among the programmes initiated by him are INSPIRE (Innovation in Science Pursuit for Inspired Research), for encouraging talent towards science, CURIE (a programme for developing excellence in research in women in universities), and PURSE (Promotion of University Research and Scientific Excellence) for energising university research. He has prepared detailed statistics to demonstrate the publications count (quantity) and their causality to policy changes during his tenure as Secretary, DST. He has also demonstrated the performance growth with citation indices (quality). He is currently connecting causes of science with resources and public policy support.

Besides Padma Shri and Padma Bhushan, Ramasami has received numerous awards for his outstanding contributions. Among the various awards received by him are: Coleman Research Prize (1976, for the best doctoral thesis from UK), Shanti Swarup Bhatnagar Award for Chemical Sciences (1993), Vasvik Prize for Chemical Sciences (1997), Om Prakash Bhasin Award for Engineering and Technology (2000), and Platinum Jubilee Award of the Indian Chemical Society (2001). In recognition of his outstanding contributions to leather research he was invited by the American Leather Chemists Association to deliver the Arthur Wilson Memorial Lecture. He is a Fellow of the Indian National Science Academy, Indian Institute of Chemical Engineers, and Third World Academy of Sciences.

Subodh Mahanti
subodhmahanti@gmail.com
Now we are not so often hearing the chirping sound of the house sparrow. A decade also this small bird usually in the daytime came to eat grains which were spread on our roofs. But today the open space is not available for this bird and as a result their number is decreasing day by day.

The Sparrow is so popular even among the biologists that if in their books, they have to compare the size, colour etc. of any other birds, they refer sparrow as a model.

Sparrow belongs to the Passeridae family and is found in different parts of the globe. The size of this bird normally is 16 cm (9.3 inch) and it weighs about 30 gram. The female sparrow and its newborns are yellowish brown colour. The male sparrow is distinguished by its bright black back feathers on which white and brown spots are present.

The zoological name of the sparrow which is seen in our surroundings is *Passer domesticus*. They are very friendly to human beings. The Latin word ‘Passer’ means active bird which clearly reflects its characteristics. This bird survives both in rural and urban areas. They feed on the food grains, seeds of weeds and insects.

Sparrow originated in the Middle East region and along the development of agriculture; it spread gradually to different parts of the world.

The reasons behind the decrease in the population of sparrow are urbanisation, environmental pollution and pesticides use.

Several initiative for conservation of sparrow at the different levels are in process. The Delhi
Urbanization and pollution are damaging bird population
government has declared this bird as the ‘State bird’ of Delhi. The largest bird conservation expedition ‘Rise for the Sparrow’ was also culminated in the national capital.

20 March is declared as the ‘World Sparrow Day’ from the year 2010. VigyanPrasar has developed a CD on the theme of biodiversity and the first song is based on this bird Sparrow. Let’s save the sparrow and help ecosystems and biodiversity of our planet to achieve a balanced state.

**Answer Water**

**Puzzle- 44 Based on Atom**

**Clue**
- A vertical column in the periodic table
- A horizontal row in the periodic table
- A set of adjacent groups in periodic table
- Who is generally credited for first widely recognized periodic table
- Metals in First row of Periodic table are called
- Gasses in group 18 of the periodic table are called
- Five member of group 17 or 7A is known as
- Z is used as symbol of
- A is used as symbol of

**WINNER**

1-Shubha K. 
(Dakshina Kannada)
विज्ञान के सरल प्रयोगों को प्रदर्शन

शास्त्रीय पूर्व माध्यमिक शाला बालीन, उत्तरी सिक्किम के द्वारा विज्ञान के सरल प्रयोगों को प्रदर्शित किया। विज्ञान दिवस के अवसर पर विज्ञान विभाग में होने वाले अनेक विज्ञानीय समारोहों में विज्ञान प्रसारित किया। वर्तमान के संस्कृति और वातावरण की जनवादी दृष्टि से अनेक विज्ञानीय समारोहों में विज्ञान प्रसारित किया। वर्तमान के संस्कृति और वातावरण की जनवादी दृष्टि से अनेक विज्ञानीय समारोहों में विज्ञान प्रसारित किया।

विज्ञान प्रकाशिती

सागर साइंस क्लब, आदर्श नगर, विजयपुर, उत्तर प्रदेश के द्वारा विज्ञान में विज्ञान प्रकाशिती का आयोजन किया। इस मौके पर र्न प्रारंभ के महत्व पर व्याख्या भी आयोजित किया। 2 मार्च, 2014 को क्लब का प्रान्ताधीन व्यवस्थापक ने ‘भर्ती हुईं मित्र हैं शायद नहीं‘ क्विज पर एक गोली भी आयोजित की।

चमक कारों की वैज्ञानिक व्याख्या

युवा विज्ञान क्लब, वसंती, उत्तर प्रदेश द्वारा 5 जनवरी, 2014 को आयोजित मानक प्रकाश ने 9 फरवरी की मात्र में हेलाम से के दौरे चमकारों की वैज्ञानिक व्याख्या कर अंधविद्यालय से व्याख्या की जानकारी दी। तत्कालीन फरवरी, 2014 से 9 मार्च, 2014 के दौरे तक वर्ष में वोल्ट में भी चमकारों की वैज्ञानिक व्याख्या कर अंधविद्यालय में लगातार कर व्याख्याता किया। इसके अलावा सारंग के जल्दी के समय वे प़िछले 9 अंकों की जानकारी और रक्त समूह की जांच कर नक्काश की महत्वपूर्ण चालू की जानकारी को प्रदर्शित किया।

Save water campaign

Holy Child School, Silvassa, Dadra and Nagar Haveli organized many programme like Nukkad Natak, Pupped Show, Quiz competition, Science Exhibition during last one year under “save water campaign 2013”, as part of international year of water cooperation.

Science model making workshop

Vivekananda Science Club, Nadiya, West Bengal conducted Science model making workshop with low cost material on December 12, 2013. Club members developed various science kit through hand on activities. Club also organized seminar on environment conservation on January 1, 2014.

Activity Report

Rural Community Science Centre, Saga conducted many programme during last year. Club conducted bio-fuel workshop, palavrushtu mela, Inspire Camp, Mathematic Programme, Auesh Training workshop with the help of different institute & organization. Club also celebrated National Science Day and World Disabled Day.

Save Environment

Adharshila Disney Club, Abohar, Punjab conducted a special activity on ‘Save environment’ for primary school students. Club also organized programme on theme ‘Save Girl Child’ during last year.