Mathematics is the door and the key to the sciences.

... Roger Bacon
राष्ट्रीय गणितीय वर्ष 2012

विकार नहीं उठाते। चीटियां बड़ी खाद सामग्री के एक बार में ही ठीक उतने बड़े टोकड़े कर लेती हैं जिन्हें वे चाहते हैं। यह वित्त और वित्तव्यवस्था है।

मनुष्य के पास बहुत सी भाषाएं हैं। हर भाषा का दान कुछ लाता या कुछ लाता लोगों का संगम है।

जब तक एक साथ बालक दिखाता नहीं हैं। गणित के साथ से ही मनुष्य ने कम्युनिकेशन बनाये और तात्त्विक ने संसार के हर कोने में आनुपात का महत्त्व जिसका उपयोग हम सब करते हैं

(इवती बनाने का निर्देश)
1. 2 कप चावल
2. 1 कप उड़ान की दाई
3. 1-1/2 चम्मच नमक
4. एक चुकुटी खाने का सोड़ा
5. 1 चम्मच तेल

तक पहुंचाया। गणित के वेदना गणना करने और समाज हम करने का मामला नहीं है बल्कि यह तो हमारे रोजमर्र के जीवन को सुगम बनाने, सुरक्षित बनाने

खोजा है...बस, बनोना।
नोट: हाल ही में विश्वविद्यालय द्वारा भारत में (10:31 जनवरी, 2012) तथा विश्वविद्यालय में (7 जनवरी से 15 फरवरी, 2012), में हमारे रोजमर्र के जीवन में गणित विषय पर दो प्रदर्शनी का आयोजन किया गया। प्रकाश प्रदर्शनी में 15 प्रदर्शन लगाए गए थे, जिनमें सुविधा: यहीं दाँड़ा गया था कि गणित का हमारे जीवन से कितना गहरा संबंध है, जिनमें असर हमें महसूस कर नहीं कर पाए। दोनों प्रदर्शनी में नया प्रदर्शन विश्वविद्यालय की वेबसाइट पर शीर्ष है उपलब्ध होगा, जिसमें आप डाउनलोड कर अपने शेर्ट के इन प्रदर्शन लाग सकेंगे।

भूमिका आयोजन एवं उसके उपरोक्त के पड़ोसी फोटोग्राफ़ का उपयोग

साथ रूपेय: लोक कला व पर्यटन में व्यावसायिक आकृति का उपयोग

गणित की भाषा के द्वारा ही मनुष्य अंतर्भाषा की गद्दी से लेकर समुद्र को पलटने का संघर्ष किया, मुख्य तात्त्विक कारण, अपने दक्षता तक, अर्थात् ‘डीजिएनए’ से लेकर विश्लेषकार डायनमिक तक के रहस्यों को खोल सकता है। इसके अलावा मनुष्य ने कला से कला रगों की द्वावर्तीं खोजी, जिन्हें में जटिल वातिलता में रंगीन और संगीत साधनों की सम्पत्ति, विभिन्न स्थानों की दृष्टियों की गणना की। रोटी बनाने से लेकर विज्ञान के
At present the entire gamut of knowledge is available to all of us with just a click of mouse. But do we have capability to convert that knowledge into technology for the socioeconomic development of our country? Let's put this question in other way, can the knowledge of chemistry acquired at school be used to test the quality of water which we drink at home or detect the adulteration in the food stuff which we purchased from market? Certainly the answer is no. One side Indian science as a whole has done well with a number of globally recognized laudable programmes but our record of scientific paper publication is very dismal and there is a decline interest in science education among our youngsters. Can we say that the science educations as is imparted, is adversely effecting the innovation, inventiveness and creativity. If we compare our self with our neighbour China, only, 35,000 patents were filed from India during 2007-2008 and China filed more than 2 million patents during same period.

We all agree to the fact that one of the objectives of science education is to develop inventiveness and creativity along with competence. It is also true that formal science education as at present develops competence. It is evident from the fact that our students perform so well in formal and scholastic tests, but only a few make it to the grade of outstanding researchers or original thinkers. The well known reason for this paradoxical situation in our education system, is due to the fact that it which seldom encourages inventiveness and creativity and the practical application of scientific knowledge in daily life.

Children are naturally observant and curious, and ready to accept the challenges. They love observing and exploring the world around them. In fact they are natural scientists. But in the name of science education, science is presented to them as a mere collection of facts, laws and formulae- a system that encourages rote learning rather than encouraging them to learn the process, approach and the methodology of or towards addressing actual problems as one come across in day - to - day life. In other words, there is hardly any scope to encourage or promote curiosity, exploration and inventiveness or the practical application of scientific knowledge. Our education system does not provide much scope to ignite the mind of our youngsters to become a keen observer, coining and raising pertinent questions, building models, predicting solutions on the basis of a model, trying out various possible alternatives and arriving at an optimum solution using experimentation, field work, research and innovative ideas in self discovery mode.

The problem of energy needs, the threat our planet is facing from climatic change, environmental degradation, the growing rate of extinction of species, declining availability of fresh water etc; are paid not much attention as part of science education. No doubt, a few programme like Children Science Congress, National Science Exhibition and Innovation in Science Pursuit for Inspired Research (INSPIRE) has been initiated as a corrective measure to reform the education system. Even all these programme are still in the category an informal/complementary science education programme.

If we took at the national efforts of science popularisation undertaken in the last couple of decades, one event that readily comes to mind is Children's Science Congress, which not only has changed the way the science is to be looked at; but also has ignited the minds of Indian children. Over the years, the project undertaken by the children on various themes has clearly shown that they have learnt to apply the scientific methods and develop the capability to translate their classroom knowledge to action for solving their problems. Time to time we have been giving information to our VIPNET Clubs and publishing the survey report of Children Science Congress. Through VIPNET News, it is always our effort to give information about such programmes which promote creativity, innovation by encouraging the application of brain and head simultaneously.

A few days back, I got an opportunity to be one of the evaluator in one more such interesting programme i.e. "Odyssey of Mind". This is a very interesting programme which is an amalgamation of art and science. The format of the programme is very interesting in which a group of children are expected to present their solution of a pre-decided problem by a drama. The design and structure of programme is such that it give full scope to a child imagination, converting his/her the idea into a reality as a problem solving device and presenting it in a drama form.
Now there is an opportunity for all the Indian children to participate in this programme through their schools. In this article we are providing you all the details of this programme. In Odyssey of the Mind, students at a young age learn Twenty-first century skills such as creativity, collaboration in team work, communication, problem solving and decision making, adaptability, self analysis, confidence and increased self-esteem. They work within a budget, so they learn to manage their money. They see that there’s often more than one way to solve a problem, and that sometimes the process is more important than the end result.

"Odyssey of the Mind" a creative problem solving program was introduced in US in 1978, the program helped pioneer the idea of creative problem solving as an educational tool. Since that time, it has grown from a small local organization to one that has affected the lives of millions of students around the world. As on date around 40 countries are participating in this international program.

The program grew stronger each year because it provides learning opportunities that allow students to apply their talents and strengths to solving "problems" that appeal to their own interests. Educators in countries like China and Singapore have integrated the program with their curriculum because they can apply classroom lessons to the problem solutions. But more than being a learning tool, the benefits of participation are innumerable.

Who Can Participate
The Odyssey of the Mind Program is open to all students. Over its more than thirty year history, millions of students from around the world have participated in advancing to World Finals! Looking at the potential of the program NASA has been sponsoring at-least 1 of the 5 long term problems decided for the year.

The themes Odyssey of Mind
The themes are built around the following problems-

1. Development of Motion Vehicle: Teams build a vehicle powered by using defined number of energy sources and a propulsion systems. The vehicle has to perform defined activities like moving in front and reverse direction showing different emotions.

2. Weird Science - The NASA sponsored activity, asking children to pick up a picture from the ones displayed by them. Define the location creatively and based on sample analysis from that place define the probable scientific reasons.

3. Classics...’ To be or Not To Be”: Every year a Classic is made the basis of performance. This year (2012) the teams were asked to create a performance where they depict the dual state of Mind’. Their conscious /sub conscious mind character is based on characters from literary classics Hamlet.

4. Structure: Using Balsa wood the dimensions of the structure are defined and load bearing Capacity is judged. 9 to 15 grams of Balsa Wood and glue were designed into structures that have been known to hold thousands of pounds.

5. Odyssey Angels : This is a performance based problem. The characters/ situations are defined and script is woven around them. This year it was around...
National Mathematical Year 2012

“I heard I forgot, I saw I remembered, I did I understood.”
This proverb has been used by many educators to stress on hands-on teaching – learning methodology which helps development of various faculties of brain. Creativity and critical thinking are key to education as opposed to learning by rote. For development of country the citizens need to think out-of-box and dream with open eyes. Realizing the fact that creativity can be nurtured, school system have started nurturing the talent.

Various studies on achievements of students nurtured for development of various skills have been taken up. As per a study report by E. Paul Torrance, a famous American educator, to predict the creative achievements in adult life, “The comprehensive study found that highly creative students outperformed the highly intellectual ones in a ratio of 3:1.”

Angels. A dumb Angel and another with Super power create an original performance that focused on something that changes the life of individuals and Community.

The overall process:
1. Register for school membership – Identify School Coordinator, Problem Coordinators (coaches).
2. Division-wise and Problem-wise identification of team(s). There have to be minimum 5 and maximum 7 members in the team. The age of the eldest member of the team decides the Division of the team.
   Division I: Grades K to 5 - under the age of 12 years (as on April 30 of World Fair year)
   Division II: Grades 6 to 8 - under the age of 15 years
   Division III: Grades 9 to 12 - under the age of 18 years
   Division IV: - Post High School
3. Form teams for each identified problem. (Please send information to India Coordinator of the Odyssey of Mind programme).
4. Wait for information on Schedule of Coaches and participate in the session.
5. Practice Long Term problems for each team.
6. Practice Spontaneous problems.
7. Develop scripts, Props, dresses for the Regional contest.
8. Identify judges and send their information to Indian Coordinator.
9. Make Judges oversee the progress of students.
10. Participate in India’s Final contest, if qualify in Indian Fair, prepare for World Fair which is organised in USA.

ODYSSEY of Mind is an international educational program for students from kindergarten through college. Team members apply their creativity to solve problems that range from building mechanical devices to presenting their own interpretation of literary classics. They then bring their solutions to competition on the local, state, and World level. Thousands of teams from throughout the U.S. and from about 25 other countries, including India participate in the program.

Since past two year, In India the Odyssey of Mind is being organised and children has participated in the international event i.e.; World Fair.

For More details-
visit www. odysseyofthemind.com.
Those interested in participation can contact Prebhat Sachdeva, Director, Odyssey of the Mind – India at suprabhat.ens@gmail.com or visit www. Om-india.com

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The 19th National Children's Science Congress was organised at Jaipur during 27 to 31st December, 2011. In the congress about 610 child Scientists representing 34 States and UT's participated and presented their finding in more than 17 different Indian languages. 15 research organization such as DRDO, BARC, ISRO including Vigyan Prasar put-up their stalls in the exhibition. Activity corners like Vedic Mathematics, Virtual Labs, Nanotechnology, Liquid Nitrogen shows etc. were the main attraction of this exhibition.

Scientists from various field like IPR, space application, science communication etc. interacted with the child scientists in face to face sessions. Opportunity was also made available to the Child Scientists to interacts though video conferencing to the scientists of renowned institutions in Pune, Ahmedabad, Delhi, Chennai, Bangalore and Kolkata.

Vigyan Prasar put-up an exhibition on theam 'Transit of Venus' and organised quizzes for the child scientist and other children visited the exhibition. Vigyan Prasar distributed around Ten prizes each day in the form of VP software to the winners of various quizzes.
Activity Kit on Chemistry

Vigyan Prasar has brought out an activity kit on "Chemistry". This Kit comprises 45 hands-on activities illustrating scientific principles related to chemistry. These activities are self-explanatory, easy to understand and useful for the student from class 6th to 10th.

Kit is designed as a part of Country wide out reach programme to celebrate International Year of Chemistry 2011. It aims to engages students to understand concepts and applications of chemistry in daily life through hand on activities, games etc.

For more details please write to:

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Website: http://www.vigyanprasar.gov.in

Price : ₹ 150/-*
Available in Hindi & English
* Postal charges will be extra.

45 Activities

[Image of activity kit cover]
'Googol, can you say what is common in duck, egg and love?'
The question came from my uncle. I was doing my math homework and he was absorbed with some intricate problems in mathematics when suddenly he popped the question to me.
I fumbled for a second. I did not have a clue about the answer.
'Do you want more clues?' uncle asked me again seeing my blank look.
'Well, yes…' I was not sure how much that would help.
'Well, here is a cryptic clue for you: number delivered in a circular letter,' said he.
'I suppose all letters delivered by postman are rectangular. I did not see a circular letter ever,' I tried to reason with him.
'Fool, the word letter is a pun'.
This time uncle was seemingly upset over my hurried reply without giving much thought in it. Well, before you also try thinking with me, let me introduce myself first. I am Googol. Of course, this is my nickname, but I like the name very much. And everybody calls me in this name. When I was born, my mathematician uncle has given this name to me.
The name googol carries an interesting story what my uncle later told me. In 1938, Dr. Edward Kasner (1878-1955), a mathematician, asked his nephew Milton Sirotta, then nine years old, to think a name for a really big number, namely, 1 with a hundred zeros after it (10100). Milton came up with the name googol. Then at the same time, to name a still larger number, Dr. Kasner coined the term googolplex. It was first suggested that a googolplex should be 1, followed by writing zeros until you got tired. This was a description of what would happen if one actually tried to write a googolplex, but as you can presume that different people got tired at different times. The googolplex then, is determined as a specific finite number, with so many zeros after the 1 that the number of zeros is a googol (10googol). A googolplex is much bigger than a googol, much bigger even than a googol times a googol. These inventions caught the public's fancy and are often mentioned in discussions of very large numbers. In this context, let me give you another information that Dr. Edward Kasner wrote a book with James Newman titled Mathematics and the Imagination.
Now about my uncle's riddle. I tried to get the information from the cryptic clue. The clue that that word letter is a pun led me to think about our alphabetic letter. And here we have the circular letter 'O' and the number delivered with that letter is… 'Oh, I got that!' I exclaimed, 'the answer is Zero'.
But still I was not sure about how to relate zero with duck, egg and love. So I commented, 'But uncle, how other three words are related with zero?'
'Well, you know when a cricketer gets a duck…'
'Yes, when he scores no run that means zero'
'And in tennis or badminton, you might have heard the score as 10-love'
'And in that case also the score love means zero'
'The French word for egg is l'oeuf. Now since zero looks more or less similar in shape as that of an egg, so l'oeuf after some changes became love, which the present reason of calling a zero as love'
'There are of course a lot of names given to zero or something conceptually as zero like cipher, aught, nought, naught, not, nil, null, nothing, none.'
'And I have heard people say the letter 'O' to say zero like O-1-3-1 to represent 0131.'
'Yes, you are right. Sometime it is quicker and easier to pronounce monosyllable words. That may be the reason for speaking 'O' as zero. Of course, there are some incidences where something like 'O' was used by early mathematicians to represent zero.'
'He might be a genius who discovered zero?'
'Indeed he was. But there is a long history of zero…'
'Tell me something about it,' I was very eager to know.
'Initially, the zero as a number was not available. There was the idea of empty space, which may be thought conceptually similar to zero. Babylonians around 700 BC
uses three hooks to denote an empty place in the positional notation. They used a symbol sort of like a "Y" for one, and a symbol sort of like "<" for ten.'

'What about Greek mathematicians?' I asked.

'Yes, almost during the same time, Greek mathematicians made some unique contributions to mathematics. The interesting feature is that Greek math is mostly based on geometry. Euclid wrote a book on number theory named Elements, but that was completely based on geometry. The newer system of Greek math, which is more than 2000 years old, uses Greek letters for 1 to 9, 10 to 90, and 100 to 900. 1 is written as 'A' (alpha), 10 as 'I' (iota), and 100 as ' (rho). They did use a limited place system, so '111' was written as 'IA'. For 1000 and above they used a mark such as ', or /' before the number of thousands. So, '1000' is ',A' or '/A', and ten thousand is ',I' or '/I'.

'So there was no concept of zero even for Greek mathematicians,' I wondered.

'Not exactly like that. Greek astronomers might feel the need of empty space and they began to use the symbol 'O'. It is not clear why they favoured the particular notation. It may be related with the first letter of the Greek word for nothing namely ouden or it may come from obol, a coin of almost no value.'

'I think then Romans also did not have any idea of zero, since I know Roman number system has letter like 'X' for 10,' I said.

'You are right. Roman numerals for 1, 10, 100, and 1000 are I, X, C, and M. It is interesting that Greeks or Romans relied more on the Abacus that they used to perform arithmetic operations such as addition, subtraction, division, or multiplication and they must not have thought any operation related with zero.'

'So zero was not in the mind of those early Greek or Roman mathematicians,' I said.

'Yes, in early history of most of these civilizations, there was no concrete evidence of zero or its use. This may be due to conceptual difficulty to figure out something, which would represent nothingness.'

'What about Indian civilization?' I got interested.

'Around 650AD, the use of zero as a number came into Indian mathematics. The Indian used a place-value system and zero was used to denote an empty place. In fact there is evidence of an empty placeholder in positional numbers from as early as 200AD in India. In around 500AD Aryabhata devised a number system, which has no zero, as a positional system, but used to denote empty space. There is evidence that a dot had been used in earlier Indian manuscripts to denote an empty place in positional notation. For example, to represent '100' it would be two dots after 1.'

'So use of zero as number started,' I said.

'In 628 AD, Brahmagupta wrote Brahmasphutasiddhanta (The Opening of the Universe), and attempted to give the rules for arithmetic involving zero and negative numbers. He explained that given a number then if you subtract it from itself you obtain zero. He gave the following rules for addition, which involve zero: The sum of zero and a negative number is negative, the sum of a positive number and zero is positive; the sum of zero and zero is zero. Similarly, he gave the correct rules for subtraction also.'
What's in a name?

- Portuguese: zero
- Italian: nullità
- French: zéro
- German: null
- Spanish: cero
- Danish, Indonesian: nol
- Dutch: nul
- Finnish: nolla
- Hungarian: zero
- Norwegian: null
- Swedish: noll

Words similar or closer to meaning of zero are cipher, aught, nought, naught, not, nil, null, nothing, none.

Probably the synonymous word (z)ero and (n)il produced the word zilch, which is a slang meaning nothing. Sometimes a person is also called zilch to indicate as being insignificant or nonentity.

The word goose egg is another slang for zero, especially when written as a numeral to indicate that no points have been scored.

In mathematics, the terminology infinitesimal indicates a function or variable continuously approaching zero as a limit.

Nilpotent is an algebraic quantity that when raised to a certain power equals zero.

'Brahmagupta then said that any number when multiplied by zero is zero but when it comes to zero, he gave some rules that were not correct. But remember, when the concept was just developing, it is quite usual that he would make the mistake. So it is an excellent attempt to visualise number system in the light of negative numbers, zero and positive numbers.'

'Brahmagupta seems a genius!' I exclaimed.

'In 830, Mahavira wrote Ganita Sara Samgraha (Collections of Mathematics Briefings), which was designed as an update of Brahmagupta's book. He correctly stated the multiplication rules for zero but again gave incorrect rule for division by zero.'

'So could anybody make the correction?' I asked.

'After 500 years of Brahmagupta, Bhaskara tried to solve the problem of division by stating that any number divided by zero as infinity. Well, conceptually though it is still incorrect, however Bhaskara did correctly state other properties of zero, such as square of zero is zero and square root of zero is also zero.'

'So Indian mathematicians developed the concept of zero and stated different mathematical operations involved with zero. But how did the concept spread to all over the world?' I asked.

'The Islamic and Arabic mathematicians took the ideas of the Indian mathematicians to further west. Al-Khwarizmi described the Indian place-value system of numerals based on zero and other numerals. Ibn Ezra, in the 12th century, wrote The Book of the Number, which spread the concepts of the Indian numeral symbols and decimal fractions to Europe.

'In 1247 the Chinese mathematician Ch’in Chiu-Shao wrote Mathematical treatise in nine sections which uses the symbol 'O' for zero. In 1303, Chu Shih-Chieh wrote Jade Mirror of the Four Elements, which again used the symbol 'O' for zero.

'In around 1200, Leonardo Fibonacci wrote Liber Abaci where he described the nine Indian symbols together with the sign '0'. However, the concept of zero took some time for acceptance. It is only around 1600 that zero began to come into widespread use after encountering a lot of supports and criticisms from mathematicians of the world.'

'So shunyam given by our forefathers was recognised in the world and made its place permanently as zero,' I commented.

'Interestingly, the word zero probably came from Sanskrit word for shunya or the Hindi equivalent of shunya. The word shunya was translated to Arabic as al-sifer. Fibonacci mentioned it as cifra from which we have obtained our present cipher, meaning empty space. From this original Italian word or from alteration of Medieval Latin zephirum, the present word zero might have originated.'

'That's really interesting. Uncle, I have a question. I have still a dilemma regarding division with zero. Could you please clarify more?' I expressed my problem.

'Well dear, it will take some more time for clarification. I will take it in some other day,' uncle remarked and again become engrossed with his problem after this long discussion.

I had also to finish my homework, so I stopped for the time being. But zero was moving in my brain, and many questions started coming in my mind regarding this amazing concept of nothing.
Mathematical Puzzle 23, based on Number System

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Clues

- A number, which is the Square root of a negative number.
- Any number that can be express as a fraction x/y with x a natural number and y an integer.
- 0, 1, 2, 3, 4, 5, 6, 7, 8, and so on...are
- A whole number. It may be positive, negative, or zero.
- A number that can be divided by only itself and one.
- A number greater than zero.
- An integer (whole number) that is not divisible evenly by 2.
- An integer which is a multiple of two
- A counting number.
- A number less than zero.

R. K. Yadav
drrahiiprs@gmail.com

Please send your entries to:
Mathematical Puzzle-23, VIPNET News,
Vigyan Prasar, A-50, Sector 62, Noida-201 309 (U.P.)

The puzzle has been Designed as part of National Mathematical Year-2012

Chemicals Terminology Puzzle-19

Name of the winners:
1 - R.M. Ganga Pavani (Chennai)
2 - Partha Dutta (West Bengal)
3 - Rishab Raina (Jammu)

Penicillin

Penicillin was the first group of antibiotics that were effective against many previously untreatable diseases such as syphilis and Staphylococcus infections. Scottish scientist Alexander Fleming accidentally discovered penicillin in 1928. For this discovery he received the Noble Prize in Medicine in 1945. The discovery of penicillin and subsequent antibiotic drug mark the most important development in the world of medicine. The chemical structure of penicillin was determined by British chemist Dorothy Crowfoot Hodgkin in 1945.

NAME OF THE WINNERS:
1 - Nazre Husain Ansari (Pilibhit), 2 - Swayam Prakash Das (Odisha), 3 - Anam Arya (Khagaria)

Correct Answer of Photo Quiz 64

Penicillin was the first group of antibiotics that were effective against many previously untreatable diseases such as syphilis and Staphylococcus infections. Scottish scientist Alexander Fleming accidentally discovered penicillin in 1928. For this discovery he received the Noble Prize in Medicine in 1945. The discovery of penicillin and subsequent antibiotic drug mark the most important development in the world of medicine. The chemical structure of penicillin was determined by British chemist Dorothy Crowfoot Hodgkin in 1945.

NAME OF THE WINNERS:
1 - Nazre Husain Ansari (Pilibhit), 2 - Swayam Prakash Das (Odisha), 3 - Anam Arya (Khagaria)
Celebration of Ozone Day & National Science Day

Jeevan Sikshan Vidyalaya, Parvati Nagar, Nagpur organised ‘Ozone day’ on 16th September to show the importance of ozone layer as well as celebrate national science day on 28th February in this occasion club also organised science exhibition.

Celebration of Van Mahotsava

Anveshan Vipnet Club, Hazaribagh, organised holding of the 61st Van Mahotsava as a DAV Forest Department joint venue and this singular honour has been due mainly to and a vindication of, our strong and steadfast espousal of the cause of conservation through plantation.

On this occasion the sapling were planted of the DAV Hazaribag campus by the Chief Guest and the other distinguished guests.