

SCIENCE CENTRE NEWS LETTER

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SCIENCE CENTRE

Volume 5, Issue 5

WHAT'S NEW IN SCIENCE

Chandrayaan-2

Chandrayaan 2 is an Indian lunar mission that will boldly go where no country has ever gone before—the Moon's South Polar Region with this effort, the aim is to improve our understanding of the Moon's discoveries that will benefit India.

The lunar South Pole is especially interesting because of the lunar surface area here that remains in shadow are much larger than that at the North Pole. There is a possibility of the presence of water in permanently shadowed areas around it. In addition, South Pole region has craters that are cold traps and contain a fossil record of the early solar system.

Chandrayaan-2 is an attempt to soft land the lander- Vikram and rover-Pragyan in a high plain between two craters, Manzinus C and simpelius N, at a latitude of about 70° South. The GSLV Mk-III (Geosynchronous Satellite Launch Vehicle Mark-III) had carried Chandrayaan 2 to its designated orbit. This three-stage vehicle is India's most powerful launcher to date, and is capable of launching 4-ton class of satellite to the Geosynchronous Transfer Orbit (GTO). The Orbiter will observe the lunar surface and relay communication between Earth and Chandrayaan 2's lander- Vikram. The Lander of Chandrayaan 2 is named Vikram after Dr. Vikram A. Sarabhai, the



Father of the Indian Space Programme. The Lander is designed to execute a soft landing on lunar surface. Chandrayaan 2's Rover is a 6-wheeled robotic vehicle named Pragyan. It can travel upto 500m (1/2-a-km) and leverages solar energy for its functioning. It can only communicate with the Lander.

This mission will help us gain a better understanding of the origin and evolution of the Moon by conducting detailed topological studies, comprehensive mineralogical analyses, and host of other experiments on the lunar surface. Chandrayaan-2 launch scheduled on 15th July, 2019 was called off due to a technical snag noticed at around one hour before launch. The launch was rescheduled on 22 July, 2019 from Satish Dhawan Space Center at Sriharikota on-board GSLV Mk-III. It will be injected into an Earth parking 170 x 39120 km orbit. The orbit of Chandrayaan-2 around the Moon will be circularized to 100x100 km orbit through a series of orbital maneuvers. On the day of landing, the Lander will separate from the Orbiter and then perform a series of complex maneuvers comprising of rough braking and fine braking. The Lander- Vikram will finally land near South Pole of the Moon on 7 September, 2019.

Courtesy :
Smt. Vasumatiben Thakor 'Chachi' Primary School No. 286

SCIENTIST OF THE MONTH

Autar Singh Paintal

Autar Singh Paintal was born on September 24, 1925 at Mogok, Burma. His educational qualifications include M.B.B.S, Ph.D. and D.SC from Edinburgh University. Dr. Paintal discovered the atrial volume receptors and the type-J receptor. He studied people with high altitude pulmonary oedema. His studies showed that the type-J receptors not only produce breathlessness but also cough, chest pain and muscle weakness. His finding served well for the victims of Bhopal gas tragedy. For the treatment of patients of lung and heart diseases, his studies and

findings will be of great importance.

Professor Paintal received the Shakuntala Devi Amir Chand Prize in the year 1956, Jawaharlal Nehru Award in 1983, Delhi University Award in 1984, J.C. Bose Medal in 1985. He was honoured with the Padma Vibhushan in 1986 and the C.V. Raman Award in 1995. He was the Director General of the Indian Council of Medical research. He died in Delhi on 21 December 2004 at the age of 79.



Courtesy :
Smt. Vasumatiben Thakor 'Chachi' Primary School No. 286



Timings

Tuesday to Friday
9.30 am to 4.30 pm

Saturday - Sunday
& Public Holidays
11.00 am to 6.30 pm

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SCIENCE FACTS SEPTEMBER 2019

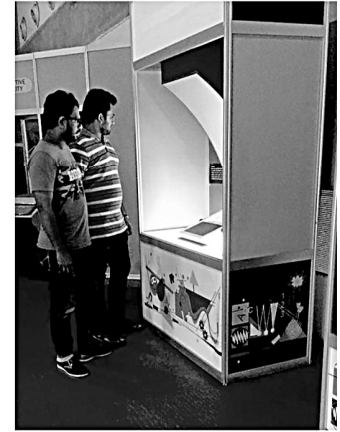
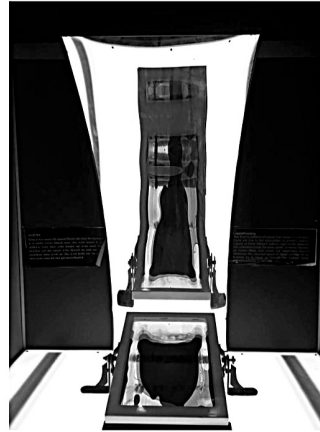
5th Sep 1962	India's first Vice President Dr. Sarvapalli Radhakrishnan was born on this day. (" Teacher's Day ")
6th Sep 1766	John Dalton (Inventor of Law of partial pressure & Thermal Expansion) was born on this day.
8th Sep	"International Literacy Day". (UNESCO)
10th Sep 1869	Reverend Jon Scobie invented First Autorickshaw in Japan
10th Sep 1892	Arthur Holly Compton (Inventor of Compton effect) was born on this day.
12th Sep 1992	Mae Jemison, first black woman went into the Space.
14th Sep 1959	Russian first Spacecraft "Luna-2" reached at the surface the moon
15th Sep 1830	World's first inter city passenger railway started between Liverpool and Manchester.
15th Sep 1916	First Tank ever used in Combat by British Army, during battle of the "Somme".
16th Sep	"International Day for the preservation of the Ozone Layer". (U.N.)
21st Sep	"International Day of Peace"(U.N.).
22nd Sep 1791	Michael Faraday (Discoverer of electromagnetic Induction) was born on this day.
23rd Sep	Winter equinox: On this day, Day and night becomes equal on the earth.
28th Sep	"World Rabies Day". (WHO)
29th Sep 1901	Enrico Alberto Fermi (Noble Prize winner in physics for his work on "Induced Radioactivity) was born on this day.
29th Sep	"World Heart Day". (WHO)
U. N. : United Nations	
WHO : World Health Organization	

Answers: 1) c, 2) a, 3) b, 4) d, 5) d

KNOW THE EXHIBIT AT FUN SCIENCE GALLERY

Liquid Painting

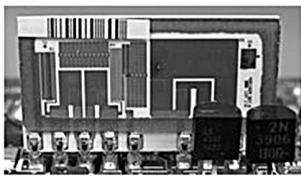
The flowing patterns of colour that create this dynamic mural are due to the subtraction of primary colours. Liquids of three different colours kept inside separate thin chambers inside the clear plastic container function as colour filters and create the secondary colours whenever the coloured layers of liquid overlap. As air bubbles try to move up through the viscous liquid different patterns are formed.



SCIENTIFIC QUESTION

What is Resistor? (Part-3)

Thick and thin film Resistor:



Thick film resistors became popular during the 1970s, and most

SMD (surface mount device) resistors today are of this type. The resistive element of thick films is 1000 times thicker than thin films, but the principal difference is how the film is applied to the cylinder (axial resistors) or the surface (SMD resistors).

Thin film resistors are made by sputtering (a method of vacuum deposition) the resistive material onto an insulating substrate. The film is then etched in a similar manner to the old (subtractive) process for making printed circuit boards; that is, the surface is coated with a photo-sensitive material, then covered by a pattern film, irradiated with ultraviolet light, and then the exposed photo-sensitive coating is developed, and underlying thin film is etched away.

Metal film Resistor:

A common type of axial-leaded resistor today is the metal-film resistor. Metal Electrode Leadless Face (MELF) resistors often use the same technology. Metal film resistors are usually coated with nickel chromium (NiCr).

Metal oxide film Resistor:

Metal-oxide film resistors are made of

metal oxides which results in a higher operating temperature and greater stability/reliability than Metal film.

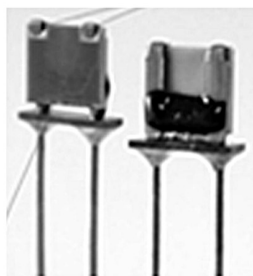
Wire wound Resistor:



Wirewound resistors are commonly made by winding a metal wire, usually nichrome,

around a ceramic, plastic, or fiberglass core. The ends of the wire are soldered or welded to two caps or rings, attached to the ends of the core. Wire leads in low power wirewound resistors are usually between 0.6 and 0.8 mm in diameter. For higher power wirewound resistors, either a ceramic outer case or aluminum outer case on top of an insulating layer is used if the outer case is ceramic, such resistors are sometimes described as "cement" resistors.

Foil resistor:



The primary resistance element of a foil resistor is a chromium nickel alloy foil several micrometers thick. Chromium nickel alloys

are characterized by having a large electrical resistance (about 58 times that of copper), a small temperature

coefficient and high resistance to oxidation. Examples are Chromel A and Nichrome V, whose typical composition is 80 Ni and 20 Cr, with a melting point of 1420° C. When iron is added, the chromium nickel alloy becomes more ductile.

Ammeter shunts:

An ammeter shunt is a special type of current-sensing resistor, having four terminals and a value in milliohms or even micro-ohms. To measure high currents, the current passes through the shunt across which the voltage drop is measured and interpreted as current. A typical shunt consists of two solid metal blocks, sometimes brass, mounted on an insulating base. Large bolts threaded into the blocks make the current connections, while much smaller screws provide volt meter connections.

Grid resistor:

This type of resistors are used in industries. Such industrial grade resistors can be as large as a refrigerator; some designs can handle over 500 amperes of current. They are used in applications such as dynamic braking and load banking for locomotives and trams, neutral grounding for industrial AC distribution, control loads for cranes and heavy equipment, load testing of generators and harmonic filtering for electric substations.

Courtesy :

Smt. Vasuben Thakor 'Chachi'
Primary School No. 286

SCIENCE QUIZ

1. What is the (approximate) value of lemon juice on pH scale?

- a) 7, b) 0, c) 2, d) 14

2. Which part of the electromagnetic spectrum has the shortest wavelength?

- a) Gamma rays, b) X-rays, c) Micro waves, d) Radio waves

3. In which layer of Earth is the geomagnetic field generated?

- a) Crust, b) Outer core, c) Mantle, d) Inner core

4. Which of the following is a non metal that remains liquid at room temperature?

- a) Phosphorous b) Helium c) Chlorine d) Bromine

5. Which of these planets has no known moon?

- a) Mars, b) Saturn, c) Neptune, d) Mercury

SCIENCE PROJECT

Surat Municipal Corporation had organized 'Science Fair' at Ground Floor, Art Gallery, Science Centre, Surat on 03rd and 04th August 2018. Smt. Vasumatiben Thakor 'Chachi' Primary School No. 286 had presented their project on 'Drumstick'.

Aim: Uses of Drumstick to increase immunity and simple remedy for various diseases.

In ancient Indian tradition in Ayurveda recommended drumstick in treatment of 300 diseases. To reduce malnutrition in children and enhancing immunity; leaves, nut, root, seed, mucilage, flower and peel of drumstick can be used as various medicine.

Uses:

1. Drumstick control cholesterol and high blood pressure.
2. Nut of the drumstick purify blood and strengthens bones and teeth.
3. Drumstick is useful in diseases of the digestive tract, ulcers, gastroesophagal, constipation.
4. The flower relieves stomach worms, gall and cough.
5. Drumstick flower has a antibacterial, antifungal and antiviral quality.



SCIENCE CENTRE

Science Centre forms the main part of the entire complex; it displays thematic galleries in the field of Science and Technology. The ground floor of Science Centre showcases 3D Theatre and Souvenir Shop. The first floor of Science Centre showcases Planetarium, Fun Science Gallery and Power of Play Gallery and second floor of Science Centre showcases Diamond Gallery, whereas Entering into Space, Cosmos Gallery under development.

3d Show	Tuesday to Friday (Time)	Saturday, Sunday & Holidays (Time)
English	09:15, 11:20, 12:00, 02:40, 04:00	11:20, 12:00, 02:40, 04:00
Hindi	10:00, 10:40, 12:40, 01:20, 02:00, 03:20	12:40, 01:20, 02:00, 03:20, 04:40, 05:20, 06:00
Science Centre + Planetarium + Museum + Diamond Gallery		
Above 18 Years	Rs. 100	
3 Years to 18 Years	Rs. 65	
Science Centre + Museum + Diamond Gallery		Planetarium
Above 18 Years	Rs. 60	
3 Years to 18 Years	Rs. 40	
Science Centre + Planetarium + Museum + Diamond Gallery + 3D Show		Tuesday to Friday
Above 18 Years	Rs. 120	
3 Years to 18 Years	Rs. 80	
Planetarium		Saturday, Sunday & Public Holidays
Above 18 Years	Rs. 50	
3 Years to 18 Years	Rs. 40	
3D Show		
Above 18 Years	Rs. 60	
3 Years to 18 Years	Rs. 40	