

SCIENCE CENTRE NEWS LETTER

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SCIENCE CENTRE

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WHAT'S NEW IN SCIENCE

Link between Obesity and Sleep loss

Can getting up late make you fat? A growing body of research has suggested that poor sleep quality is linked to an increased risk of obesity by deregulating appetite, which in turn leads to more calorie consumption. The direction of this reaction might actually be flipped: It's not the sleep loss that leads to obesity, but rather that excess weight can cause poor sleep, according to researchers from the University of Pennsylvania's Perelman School of Medicine and the University of Nevada, Reno, United States, who discovered their findings in the microscopic worm *Caenorhabditis elegans* (*C. elegans*).

"We think that sleep is a function of the body trying to conserve energy in a setting where energetic levels are going down. Our findings suggest that if you were to fast for a day, we would predict you might get sleepy because your energetic stores would be depleted" said study author David Raizen, an Associate Professor of Neurology and member of the Chronobiology and Sleep Institute at Pennsylvania. In humans, acute sleep disruption can result in increased appetite, insulin resistance and people who chronically get fewer than six hours of sleep per night are more likely to be obese and diabetic. Moreover, Starvation in humans, rats, fruit flies and worms has been shown to affect sleep, indicating



that it is regulated, at least in part, by nutrient availability. To study the association between metabolism and sleep, the researchers genetically modified *C.elegans* to "turn off" a neuron that controls sleep. This worm could still eat, breathe and reproduce, but they lost their ability to sleep. With this neuron turned off, the researchers saw a severe drop in adenosine triphosphate (ATP) levels, which is the body's energy currency. "That research suggests that sleep is an attempt to conserve energy; it's not actually causing the loss of energy", Raizen explained. In their previous research, the Vander Linder Lab, Reno, Nevada, United States, studied a gene in *C.elegans* called KIN-29. This gene is homologous to the Salt-Inducible Kinase (SIK-3) gene in humans, which was already known to signal sleep pressure. Surprisingly, when the researchers knocked out the KIN-29 gene to create sleepless worms, the mutant *C.elegans* accumulated excess fat-resembling the human obesity condition. The researchers again manipulated the KIN-29 mutant worms, this time expressing an enzyme that "freed" their fat. With that manipulation, the worms were again able to sleep. Raizen said this could explain one reason why people with obesity may experience sleep problems. "There could be a signaling problem between the fat stores and the brain cells that control sleep", he said.

SCIENTIST OF THE MONTH

Daulat Singh Kothari

Daulat Singh Kothari was born in Udaipur in Rajasthan on 6th July 1906. He received Master's degree in Physics from Allahabad University in 1928 under guidance of Dr. Meghnad Saha. For Ph.D., Kothari worked at the Cavendish Laboratory, University of Cambridge, England, under the supervision of Ernest Rutherford. He worked at the Delhi University from 1934 to 1961 in various capacities as reader, professor and Head of the Department of Physics. He was scientific advisor to Ministry of Defence from 1948 to 1961 and was then appointed as chairman of the University Grants Commission in 1961 where he worked till 1973. He was the chairman of the Indian Education Commission, which was the first ad hoc commission set up in India for the modernization



and standardization of Education in India. Dr. Kothari was President of the Indian Science Congress at its golden jubilee session in 1963. He was elected President of Indian National Science Academy in 1973. His research on statistical thermodynamics and his theory of White Dwarf Stars gave him an international reputation. He was awarded with Padma Bhushan in 1962 and Padma Vibhushan in 1973. He was also listed as a "Proud Past Alumni" by the "Allahabad University Alumni Association". In 2011, India's Department of posts issued a commemorative Stamp in his honour. He was conferred Atmaram Award in 1990 by the Central Hindi Directorate Ministry of Human Resource Development.



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 JULY 2020

1 July	Birthdays of famous Physician & Bharat Ratna Awardee Bidhan Chandra Roy which is celebrated as 'Doctor's Day' in India.
2 July 1938	Birthdays of Chandrakumar Naranbhai Patel (inventor of the Carbon Dioxide Laser).
4 July 2005	Successful collision of NASA's satellite "Deep Impact" with comet into the space was held at the distance 13.04 million km from the Earth.
5 July 1996	First Clon Mammal (Genetically identical individuals) 'Dolly' (a sheep) was born on this day
6 July 1906	Daulat Singh Kothari (well known Indian physicist) was born.
6 July 1885	Vaccine for Rabies first time used on human on this day.
7 July	International Cooperative Day (First Saturday)
11 July	World Population Day. (by U.N.)
16 July 1945	The first detonation with code name "Trinity" conducted by United States at "Los Alamesh". This date is known as the beginning of Atomic Age.
16 July 1969	Successful launching of "Apollo 11" with the help of "Saturn V" rocket from Kennedy Space Center at Florida.
18 July	Nelson Mandela International Day for freedom, justice and democracy. (by U.N.)
18 July 1980	Launching of Indian satellite "Rohini RS-1" into the Space.
19 July 1814	Samuel Colt (inventor of Revolver) was born.
24 July 1969	Successful landing of "Appolo-11" in the pacific Ocean.
25 July 1978	"Louise Joy Brown" the world's first successful Test Tube Baby was born in Great Britain.
26 July 2019	20th Annual System Administrator Appreciation Day. (Also known as Sysadmin Day). (Last Friday)
U.N.: United Nations	

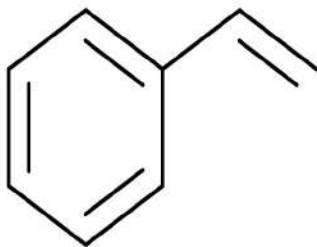
Answers: 1) a, 2) b, 3) b, 4) a, 5) d

SCIENTIFIC QUESTION

What is styrene gas? (Visakhapatnam gas leak)

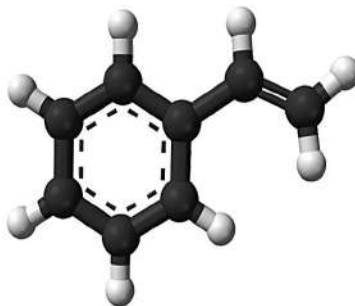
On May 7, 2020, a gas, reported to be styrene leaked from a tank at the LG Chem (LG Polymers India Private Limited) plant at Venkatapuram, Visakhapatnam, Andhra Pradesh, India. So let's try to find out what is Styrene gas.

Styrene, also known as ethenylbenzene, Vinylbenzene and Phenylethene is an organic compound with chemical formula C_8H_8 ($C_6H_5CH=CH_2$). This derivative of benzene is a colorless oily liquid. The compound evaporates easily and has a sweet smell. Although high concentrations have a less pleasant odor. Styrene is the precursor to polystyrene and several copolymers.



Styrene production in the industries can be made by: from ethylbenzene, by dehydrogenation, via ethylbenzene hydroperoxide, Pyrolysis gasoline extraction, from toluene and methanol, from benzene and ethane.

Styrene is used in manufacturing electric fan blades, cups and cutlery, containers for cosmetic products such as make-up.



Styrene is regarded as a "known Carcinogen" especially in case of eye contact, but also in case of skin contact, of ingestion and inhalation. Styrene is largely metabolized into styrene oxide in humans, resulting from Oxidation by Cytochrome P 450. Styrene Oxide is considered toxic, mutagenic and possibly carcinogenic. The U.S. Environmental Protection Agency (EPA) has described Styrene to be "a suspected toxin to the gastrointestinal tract, kidney and respiratory system, among others". The International Agency for Research on Cancer considers styrene to be "Probably Carcinogenic to humans".

KNOW THE EXHIBIT

Tangram

This Exhibit is situated between Ticket window and Souvenir shop.

The Tangram is an intellectual puzzle game, consisting of seven pieces, in the shapes of triangles and quadrilaterals. There are many patterns which may be formed from the tangram pieces. These include basic geometric patterns, shapes of animals and various common objects.

Tangram can be used as a good tool for teaching Geometry and Fractions. Students can also learn the ratios and relationship of each piece to another during process.



QUIZ

1. The pitch of sound depends on which phenomena?
a) Frequency b) Amplitude c) Both d) None
2. What kind of nature do metal oxide have?
a) Acidic b) Basic c) Neutral d) All
3. What indicates Fauna?
a) Plants b) Animals c) Both plants and animals d) None
4. What exists in gap between the orbit of Mars and Jupiter?
a) Asteroids b) Comets c) Meteor d) Meteorite
5. Where the Chlorofluorocarbon is being used?
a) refrigerator b) Air Conditioners c) Perfume d) All

Solar Eclipse

Surat Municipal Corporation had organized live streaming of Solar Eclipse on June 21, 2020 from Science Centre Surat. This Solar Eclipse started at 10:03 am, maximum eclipse occurred at 11:40 am and it was ended at 1:30 pm.

Due to the pandemic situation of Covid-19, This event was not shown directly to public but with the help of Information and System Department of Suart Municipal Corporation, The live streaming of this Solar Eclipse was done from Science Centre Surat between 10:30 am to 1:30 pm on social Account MySurat (Youtube, Facebook and Twitter). 70,000 people had seen it on Facebook, 2500 on Youtube and 1800 on Twitter.



SCIENCE PROJECT

Surat Municipal Corporation had organized Science Fair at Art Gallery, Science Centre, Surat on 30th and 31st August, 2019. Shri Maharana Pratap Primary School No. 272 had presented their project on "Wireless Electricity"

Procedure of this project: Take one piece of PVC pipe and the coil which is made by twisting the copper wire tightly. Wrap one end of the coil upwards with foil paper and bottom end of the coil is connected to the transistor. The coil is connected to a battery for Power supply. The tower constructed by this way is called "Tesla Tower". By this coil we can generate more electricity by converting small voltage to large voltage. Carrying electric tool near the tower makes it work.

