

Tech-tonic Shifts

India celebrates National Technology Day on May 11 every year. This day marks an important milestone in Indian history, as on May 11, 1998, India successfully tested nuclear bombs in Pokhran. Ever since, the day has been observed as National Technology Day, with innovators and entrepreneurs awarded and recognised for their contributions every year. This National Technology Day, let's rewind and look at some important technological milestones in India.

1959: Television programme comes home

Terrestrial television made its way to Indian homes with experimental telecast commencing in Delhi in September 1959. Daily transmission of television programmes began in 1965 as part of All India Radio. In 1975, Satellite Instructional Television Experiment or SITE, an experimental satellite communications project was launched in India jointly by National Aeronautics and Space Administration and the Indian Space Research Organisation (ISRO). Informational television programmes were made available to rural India through this experiment.



A crater at the site of the Pokhran II nuclear test. PHOTO: AFP

1974: The Smiling Buddha

The Smiling Buddha was the code name of India's first successful nuclear bomb test in May 1974. Also called Pokhran-I, the bomb was detonated on the Pokhran Test Range in Rajasthan by the Indian Army. This is the first confirmed nuclear weapons test by a nation that is not a part of the five permanent members of the United Nations Security Council.

In 1998, India conducted a series of successful nuclear bomb tests in Pokhran under the name Pokhran-II.

1975: Aryabhata reaches space

In April 1975, India's first satellite, called Aryabhata, was launched into space by a Kosmos-3M launch vehicle from Kapustin Yar, a Russian rocket launch and development site. The satellite was built by ISRO.



Aryabhata, India's first satellite. PHOTO: THE HINDU ARCHIVES

1995: The 'mobile' era is here

Mobile services arrived in India in 1995, with then West Bengal Chief Minister Jyoti Basu making the first mobile call in the country to then Union Telecom Minister in August 1995.



Nehru shown the TIFRAC. PHOTO: PTI



1959: India develops its first digital computer

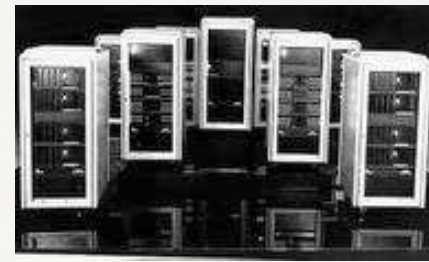
The first digital computer made its way to India in 1955, when it was installed at the Indian Statistical Institute in Kolkata. This was designed and built by British scientists. In 1957, a group at the Tata Institute of Fundamental Research (TIFR) in Mumbai began work on designing a full-scale digital computer. This was completed in 1959, and commissioned in 1960. It was installed in the new building of the TIFR in 1962 and named TIFRAC (TIFR Automatic Calculator) by Jawaharlal Nehru, then prime minister of India.



Inauguration of the Atomic Energy Establishment by then Prime Minister Jawaharlal Nehru. PHOTO: THE HINDU ARCHIVES

1991: Say hello to India's super computer

PARAM 8000 was India's first super computer designed and assembled by the Centre for Development of Advanced Computing (C-DAC) in Pune. It was commissioned in 1988, with the birth of C-DAC. It was built in three years on a budget of Rs 30 crore. Super computers as an essential step toward modern weapons system.



PARAM, the parallel super computer. PHOTO: THE HINDU ARCHIVES

2008 and 2013: To the moon and Mars

In 2008, India's first unmanned space mission to the moon was successful with Chandrayaan-I reaching the lunar orbit. A few years later, in 2013, India's Mars Orbiter Mission took flight with Mangalyaan-I. The probe lifted off on November 5, 2013, spent about a month in Earth's orbit and began its journey to Mars in November 30. Almost a year later, it entered Mars' orbit, making India the first nation to make it to Mars on its first attempt.

1958: Strengthening India's defences

In 1958, the Defence Research and Development Organisation (DRDO) was formed to strengthen the country's defences with cutting-edge defence technologies. DRDO is the Research and Development wing of the Ministry of Defence, Government of India.

PHOTO: B. JOTHI RAMALINGAM / THE HINDU



1962: A step towards India's journey to space

To harbour India's space aspirations, Dr. Vikram Sarabhai set up the Indian National Committee for Space Research (INCOSPAR). The committee undertook the responsibilities of space science and research from the

Department of Atomic Energy. The same year it started work on establishing Thumba Equatorial Rocket Launching Station. In 1968, INCOSPAR was superseded by ISRO



The surface of Mars is seen from a height of 7300m in the first image taken by the ISRO Mars Orbiter Mission (MOM) spacecraft. PHOTO: AFP/ISRO

ARTIVITY



Artwork by Ishya Jain, Class 3, Bal Bharati Public School, Pusa Road, New Delhi
 If you have original artwork related to current, trending issues, share them at school@thehindu.co.in with the subject - Artivity. Select entries will be published.
 Please mention your name, class, school and city.

QUEST

Good or bad?

Many commonly asked questions have their answers in Science. Here are a couple...

Is the silvery covering on sweetmeats safe to eat?

The silvery coating is called *vark*, *varakh* or *chandi-ka-vark* or simply silver leaf. It is made by pounding thin strips of pure silver into ultra-thin fineness. Edible but tasteless, some say the custom of adding silver leaf to food is a carry-over of the practice of using silver in Ayurvedic medicine. But nowadays it is used more for decorative purposes and perhaps to increase the shelf life of the sweets.

Vark is perfectly safe to eat — if it is not adulterated. Though the laws of the land do not allow it, sweetmeat manufacturers sometimes use *vark* that is made from impure silver, or worse, use *vark* that is made from aluminium. This can cause food poisoning or intestinal problems.



Is Ozone good or bad?

Ozone is a gas produced naturally by the action of ultraviolet rays from the sun on oxygen molecules, changing oxygen (O₂) to ozone (O₃) in Earth's upper atmosphere (stratosphere) where it forms the ozone layer. The ozone molecules here absorb most of the sun's harmful ultraviolet radiation, thereby protecting living organisms on Earth. So ozone in the stratosphere plays a beneficial role; it is good for us.

Ozone is also found in the troposphere, the lowest region of the atmosphere, extending from the Earth's surface to a height of about 6-10 kilometres. Tropospheric or ground level ozone is created when air containing pollutants emitted by cars, factories, refineries and other sources like hydrocarbons and nitrogen oxides chemically react in the presence of sunlight.

Ground level ozone is harmful to plants, animals and human health. Ozone reacts with molecules in the lining of the airways in the body. This can aggravate lung diseases such as asthma, emphysema and chronic bronchitis. Even in otherwise healthy people, continuous exposure to even low-level concentration of ozone can cause chest pain, shortness of breath, irritation of the throat, and cough.

(Content provided by Amrita Bharati)



When Federer made it 20!

REMEMBER THIS?

Here, we will sharpen our sports quotient by taking a look at one iconic moment from sporting history. A look at the 2018 Australian Open men's singles competition this time, where Roger Federer became the first man to win 20 Grand Slam titles...

Roger Federer continued to prove that age is just a number as he notched up another men's singles Grand Slam title — his 20th — at the 2018 Australian Open. Entering the tournament as the defending champion, Federer won it in style.

He did not drop a single set on the way to the final, winning all the encounters in three sets or fewer. He saw off Aljaz Bedene, Jan-Lennard Struff, Richard Gasquet, Marton Fucsovics and Tomas Berdych in straight sets, while Chung Hyeon retired during the second



Roger Federer had tears of joy after claiming his 20th Grand Slam singles title. PHOTO: AP

set in the semi-final. The final against Marin Cilic, however, went all the way. The first four sets were a see-saw battle as Federer and

DID YOU KNOW?

Roger Federer is the first, and so far only, male player to have won 20 Grand Slam singles titles.

Federer was 36 years and 173 days old when he won the 2018 Australian Open. That makes him the second-oldest man to ever win a Grand Slam singles title in the Open era (1968 onwards), behind Australian Ken Rosewall, who was 37 years and 2 months when winning the 1972 Australian Open.

The 2018 win was Federer's sixth Australian Open title. Only Novak Djokovic, who now has eight, has won more Australian Open men's singles titles.

Cilic won each of them alternatingly. Federer, though, eased through the final set to win the match 6-2 6-7 (5-7) 6-3 6-6-1 and claim his sixth Australian Open title.

HEADSTART

Creating new worlds

From writing comic books, drawing caricatures to storyboarding for films, the comics industry is bursting with career opportunities

Comics are no longer limited to books and newspaper columns. Thanks to the popularity of graphic novels, manga and films based on comic books, the industry is expanding and opening up diverse career options.

What are comic books?

Comic books are magazines consisting of comic strips. Comics became popular during World War I and II as they served as a morale-booster and a distraction to the people. Today, their popularity has once again surged with several of them being adapted into blockbuster films.

What are the prospects?

** Storyboard artists: Comic artists with cinematography and editing knowledge are



New York Times

Indian writers have ventured into graphic novels. More and more original characters, especially those based on characters from Indian mythology, are emerging.

** Commercial projects: Illustrating and creating mascots for sports teams. Ad agencies, restaurants and retail chains also hire comic artists to reach out to customers using humour.

What to study:

Anyone with drawing skills and an imagination can become a comic artist, but a background in visual arts is recommended.

** College of Art, New Delhi
 ** JJ. School of Art, Mumbai
 ** National Institute of Film and Design, Ahmedabad.

hired by production houses to draw up storyboards for films. A storyboard consists of illustrations displayed in a sequence for visualising a film.

** Animated films:

Professionals with a background in the comics industry are roped in by animation studios to work on their projects and films.

** Graphic novels: Many