

- 1. Sugar Boards :** Recently, in a proactive effort to encourage healthier eating habits among students, the Central Board of Secondary Education (**CBSE**) directed its over **24,000 affiliated schools to establish 'sugar boards'**.
 - **About Sugar Boards:** Visual displays highlighting health risks of excess sugar and showing sugar content in popular packaged foods and drinks.
 - Inspired by a public awareness campaign led by food influencer Revant Himatsingka.
 - Students participate in workshops where they:
 - ✓ Paste beverage bottles onto the board.
 - ✓ Label them with actual sugar content (in grams and teaspoons).
 - **Why Are Sugar Boards Important?**
 - **Warning by NCPDR:** The National Commission for Protection of Child Rights has flagged a rise in Type 2 diabetes among children—once considered an adult-only condition.
 - **Root Causes:** Easy access to sugary, processed foods and limited awareness in school environments.
 - **India:** ~**397 cases per 1 lakh children**—second-highest globally after China (734 cases).
 - **Sugar Consumption:** Children aged **4–10 years** get **13%** of daily calories from sugar.
 - ✓ Ages **11–18 years** get **15%**—**three times the WHO-recommended 5%**.
- 2. Uranium Enrichment:** Recently, Iran rejected suspending its uranium enrichment, lowering hopes for a quick breakthrough in nuclear talks with the United States amid ongoing diplomatic efforts.
 - **About Uranium Enrichment :** To increase the concentration of the isotope **U-235** in uranium to desired levels for different uses.
 - **Need:** Natural uranium contains about **99.3% U-238** and only **0.7% U-235**.
 - ✓ Nuclear reactors require uranium enriched to **3–20% U-235**.
 - ✓ Nuclear weapons need uranium enriched to about **90% U-235**.
 - ✓ Uranium enriched beyond **20%** is classified as **highly enriched uranium (HEU)**.
 - **About Iran Nuclear Deal :** Also known as **Joint Comprehensive Plan of Action (JCPOA)**
 - Resulted from extended talks between **2013 and 2015** involving Iran and the **P5+1 countries**—China, France, Russia, the United Kingdom, the United States, plus Germany.

- **Key Commitments by Iran:** Agreed to significantly reduce its stockpile of centrifuges.
 - Cut down on its **enriched uranium** reserves.
 - Limited its supply of **heavy water**, all critical materials for developing nuclear weapons.
 - In 2018, the US unilaterally withdrew from the JCPOA and reimposed oil and banking sanctions.
 - In response, Iran resumed and intensified its nuclear programme, reaching nearly 97% of its pre-2015 nuclear capacity.
- 3. Tianwen-2 Mission :** Recently, China announced plans to launch its **Tianwen-2** mission, marking its first effort to collect and return samples from a **near-Earth asteroid**. The mission aims to provide valuable insights into the **solar system's history** and the possible **origin of the Moon**.
- **About Tianwen-2 Mission:** Retrieve samples from asteroid Kamo'oalewa and bring them back to Earth.
 - **Significance:** If successful, China will join an elite group of countries ,including the **United States** and **Japan** — that have successfully conducted asteroid sample-return missions.
 - **Post-mission Plan:** After the sample drop, the probe will continue to the **main asteroid belt** for extended scientific exploration.
 - **About Asteroid Kamo'oalewa:** First identified in 2016 by the Pan-STARRS 1 telescope in Hawaii.
 - One of only seven known **quasi-satellites of Earth** — objects that orbit the Sun but stay relatively close to Earth due to gravitational interactions.
 - **Orbital Pattern:** Appears to lead and trail Earth in its orbit, creating an illusion of orbiting Earth itself.
 - **Stability:** Has remained in its current orbit for around 100 years and is expected to continue for at least another 300 years.
- 4. Madden-Julian Oscillation:** Recently, Mumbai's monsoon arrived two weeks early in 2025, causing heavy rain, waterlogging, traffic jams, and train delays, making it the wettest May in over 107 years.
- The Madden-Julian Oscillation has emerged as the key factor behind these unprecedented heavy rains.

- **About Madden-Julian Oscillation** : An ocean-atmosphere phenomenon that influences global weather patterns, causing significant fluctuations in tropical weather on weekly to monthly timescales.
 - **Characteristics:** Represents a disturbance in **clouds, wind, and pressure**.
 - ✓ Moves eastward at **4-8 meters per second**.
 - ✓ Completes a global circuit roughly every **30-60 days**, sometimes taking up to **90 days**.
 - ✓ Most prominent over the **Indian and Pacific Oceans**.
 - **Effect on Weather:** As the MJO moves, it often divides the Earth into two halves:
 - ✓ One experiencing the active (enhanced rainfall or convective) phase.
 - ✓ The other in the suppressed rainfall phase.
 - **Impact on Indian Monsoon:** The MJO cycle has **eight phases**.
 - ✓ When the MJO is over the Indian Ocean during monsoon season, it enhances rainfall over the Indian subcontinent.
 - ✓ If the MJO lingers longer over the Pacific Ocean, it tends to cause poor monsoon rainfall in India.
- 5. **Revamped Sanchar Mitra Scheme:** Recently, the Union Minister of Communications and Development of the North East Region announced the theme for the 9th edition of the India Mobile Congress (IMC) 2025 — **“Innovate to Transform.”**
 - The minister also launched the revamped ‘Sanchar Mitra Scheme,’ transforming it into a national movement driven by youth volunteers.
 - **About IMC 2025:** Highlights innovation’s transformative role in telecom, digital infrastructure, sustainability, and societal growth.
 - Promotes collaboration among industry leaders, startups, and tech enthusiasts to develop future-ready solutions.
 - **Technology Focus** Features 1,000+ use cases centered on emerging technologies such as 5G, 6G, AI, IoT, electronics manufacturing, and green technology.
 - **About Sanchar Mitra Scheme** : Mobilize student volunteers from technical fields (telecom, electronics, IT, cybersecurity) to raise awareness on: Telecom safety, Cybersecurity, Prevention of telecom frauds and Government digital initiatives.

- **Scope and Benefits:** Outreach across communities, schools, and public spaces.
 - ✓ Skill development through involvement in R&D, startups, policy work, field surveys, and national events.
 - ✓ Incentives and recognition managed by the Department of Telecommunications (DoT).
- 6. **Topological Materials:** Scientists at the Raman Research Institute (RRI), an autonomous body under the Department of Science and Technology, have discovered a novel method to detect topological invariants.
 - **About Topological Invariants:** Special properties of materials that remain unchanged under continuous deformation — such as stretching or bending — without cutting or gluing.
 - **Topological Materials:** Such as topological insulators and superconductors — exhibit unique and unconventional electronic behaviors.
 - These properties are governed by topological invariants like **winding numbers** and **Chern numbers**, which determine how electrons respond to the material's geometry.
 - Because these invariants are robust against defects and deformations, topological materials hold great promise for **advanced technological applications**, including **quantum computing**, **spintronics**, and **low-power electronics**.
 - **Limitations of Conventional Methods:** Traditional techniques like Angle-Resolved Photoemission Spectroscopy (ARPES) have been used to study electron behavior in materials, but they often fall short in revealing deeper topological characteristics.
 - **New Breakthrough:** Recent advancements show that the spectral function itself can unveil topological features, offering a new dimension to the study of quantum materials.
- 7. **Report on "Designing a Policy for Medium Enterprises":** Recently, NITI Aayog released a landmark report titled *"Designing a Policy for Medium Enterprises"*, outlining a strategic roadmap to transform India's medium enterprises into key drivers of growth for Viksit Bharat @2047.
 - **Importance of Medium Enterprises in the MSME Ecosystem :** The MSME sector accounts for approximately **29% of India's GDP** and provides employment to over **60% of the workforce**.
 - **Distribution of MSMEs:** Micro enterprises: 97% , Small enterprises: 2.7% and Medium enterprises: Only 0.3%

- o Despite their small share, medium enterprises contribute nearly **40% of total MSME exports**, highlighting their critical role in **boosting industrial competitiveness and export growth**.
 - **Major Highlights of Report:** Medium enterprises face a credit shortfall of \$10 billion, largely due to institutional and structural hurdles.
 - o Medium enterprises often receive fewer priority sector loans and face interest rates around 4% higher than those offered to large firms.
 - o Only 8 out of 18 MSME government schemes cater to medium enterprises.
 - o They receive just 17.81% of total MSME scheme funding, worsening their working capital constraints.
- 8. Large Hadron Collider (LHC):** India celebrated the 2025 **Breakthrough Prize in Fundamental Physics** is awarded to co-authors of publications based on **CERN's Large Hadron Collider Run-2** data released recently, at the experimental collaborations **ATLAS, CMS, ALICE and LHCb**.
- **About Large Hadron Collider:** Operated by CERN (European Organization for Nuclear Research), the it is the **world's most powerful particle accelerator**, enabling high-energy proton and heavy-ion collisions to explore the structure of matter at the smallest scales.
 - o It consists of a **27-kilometre ring of superconducting magnets with a number of accelerating structures**. It is located in Geneva, Switzerland.
 - **ATLAS:** It explores a broad spectrum of physics topics, including the Higgs boson, extra dimensions, and particles that might constitute dark matter. Particle beams from the LHC collide at the center of the ATLAS detector, producing collision debris in the form of new particles that scatter in all directions from the collision point.
 - **CMS:** This detector has an extensive physics program from studying the Standard Model (including Higgs boson) to searching for extra dimensions and potential dark matter particles.
 - **ALICE:** This detector is dedicated to heavy-ion physics at the LHC. Its goal is to study the physics of strongly interacting matter at extremely high energy densities, where a state of matter called quark-gluon plasma is formed.
 - **LHCb:** This experiment focuses on examining the subtle differences between matter and antimatter by studying particles known as "beauty quarks" or "b quarks."