E-waste rule

- The burgeoning problem of managing e-waste is a cross cutting and persisting challenge in an era of rapid urbanisation, digitalisation and population growth. The first set of e-waste Rules was notified in 2011 and came into effect in 2012.
- An important component of the Rules (2011) was the introduction of Extended Producer Responsibility (EPR). Under EPR compliance, 'producers' are responsible for the safe disposal of electronic and electric products once the consumer discards them. E-waste rules 2016, which were amended in 2018, were comprehensive and included provisions to promote 'authorization' and 'product stewardship'
- In November 2022, the Ministry of Environment and Forests further notified a new set of e-waste rules, which will come into force from April 1, 2023.

- The first main chapter of the E-Waste (Management) Rules 2022 includes the provision of an EPR framework, the foremost requirement being the 'Registration of Stakeholders' (manufacturer, producer, refurbisher, and recycler).
- Many formal recyclers undertake activities only up to the pre-processing or segregation stage, and thereafter channelise e-waste to the informal sector, which is a pure violation of law.
- A 'digitalized systems approach', introduced in the new rules (2022), may now address these challenges.
- Standardizing the e-waste value chain through a common digital 'portal' may ensure transparency and is crucial to reduce the frequency of 'paper trading' or 'false trail', i.e., a practice of falsely revealing 100% collection on paper while collecting and/or weighing 'scrap' to meet targets.

The informal sector left out

- Fresh challenges might emerge as companies are no longer required to engage with PROs and dismantlers, who partially ensured 'double verification' in terms of quantity and quality of recycling.
- The informal sector, which plays a crucial role in e-waste handling, draws no recognition in the new

rules which could be on account of its 'illegality'.

- The informal sector is the 'face' of e-waste disposal in India as 95% of e-waste is channelized to the sector.
- In the hierarchical process of e-waste collection, segregation, and recycling in the informal sector, it is the last stage that poses a major concern where e-waste is handed over to the informal dismantlers/recyclers.
- The rest of the stages (collection of mixed waste, segregation of e-waste, clustered accumulation of e-waste according to their type) do not involve any hazardous practices and should in fact be strategically utilized for better collection of e-waste.
- For instance, 'Karo Sambhav', a Delhi based PRO, has integrated informal aggregators into its collection mechanism.

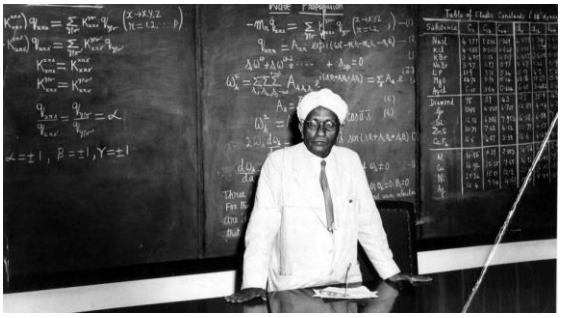
Steps needed

- In order to ensure the efficient implementation of the law, stakeholders must have the right information and intent to safely dispose of e- waste.
- There is a need for simultaneous and consistent efforts towards increasing consumer awareness, strengthening reverse logistics, building capacity of stakeholders, improving existing infrastructure, enhancing product designing, rationalizing input control (by defining 'rare earth elements' as 'critical raw materials'), and adopting green procurement practices.
- This should be supplemented by establishing a robust collection and recycling system on the ground, making it responsive to meet legislative requirements.

THE HINDU

National science day and Raman Effect

- 28th February is celebrated as National Science Day (NSD) in India. NSD is celebrated to commemorate the discovery of the 'Raman Effect', which led to Sir C.V. Raman winning the Noble Prize.



When the day was declared National Science Day?

- In 1986, the National Council for Science and Technology Communication (NCSTC) asked the Government of India to designate 28

February as National Science Day which the then Govt. of India accepted and declared the day as National Science Day in 1986. The first National Science Day was celebrated on February 28, 1987.

What is Raman Effect?

- Raman Effect is a phenomenon in spectroscopy discovered by the eminent physicist Sir Chandrasekhara Venkata Raman in 1928.
- After two years in 1930, he got Nobel Prize for this remarkable discovery and this was the first Nobel Prize for India in the field of Science while working in the laboratory of the Indian Association for the Cultivation of Science, Kolkata.
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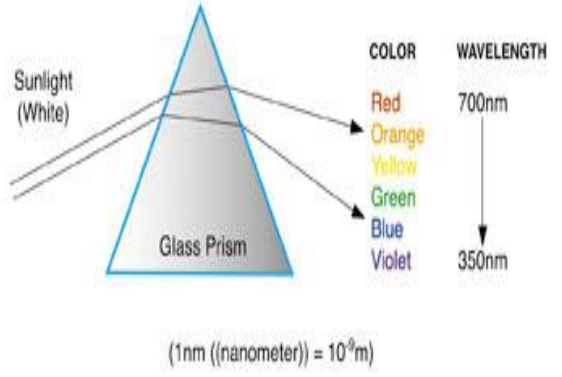
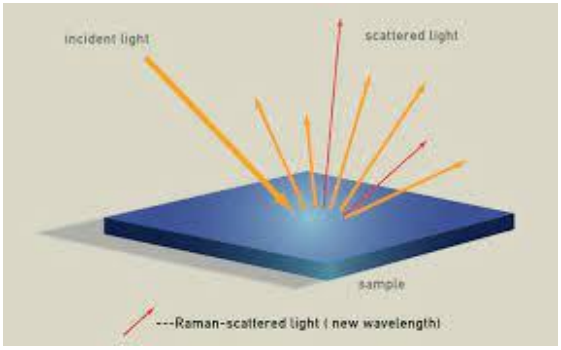
- 

- Raman Effect is a change in the wavelength of light that occurs when a light beam is deflected by molecules.
- When a beam of light traverses a dust-free, transparent sample of a chemical compound, a small fraction of the light emerges in directions other than that of the incident (incoming) beam.
- Most of this scattered light is of unchanged wavelength. A small part, however, has wavelengths different from that of the incident light; its presence is a result of the Raman Effect.

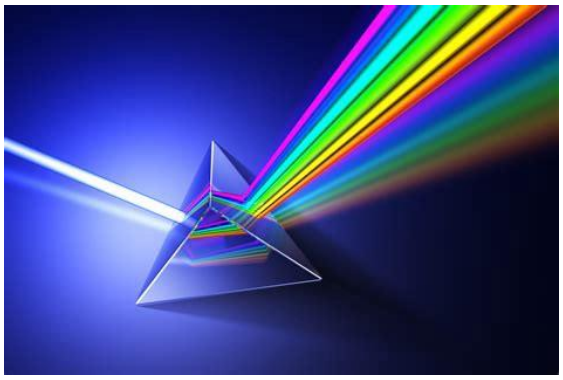
NSD 2023

- The theme of NSD-2023 is "Global Science for Global Wellbeing". The Global Science for Global Wellbeing theme has been chosen for the purpose of raising public appreciation of the scientific issues in a global context which is having a bearing on global wellbeing.
- 

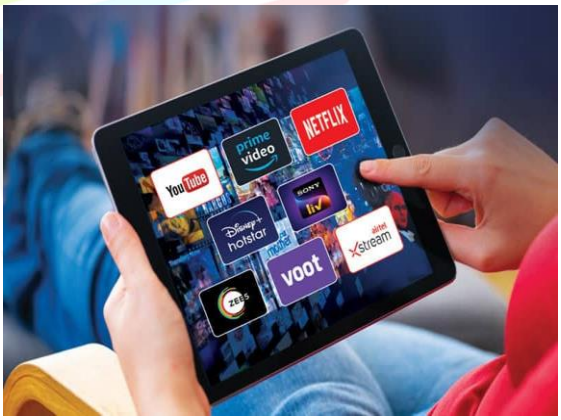
- The four-fold approach of integration would consist of the

integration of all the scientific departments which can work on a theme-based approach; extended scientific integration encompassing engineering, medical, and other institutions; extra scientific integration involving the identification of the needs of other ministries like jal Shakti, railways, etc; and extended science driven all-inclusive approach integrating startups & industry.

- The National Council for Science & Technology Communication (NCSTC) of the Department of Science & Technology (DST) is the nodal agency to support catalyze and coordinate the celebration of the NSD throughout the country, particularly in scientific institutions & research laboratories.
- NCSTC has supported various programs countrywide by supporting its State S&T Councils & Departments for the organization of lectures, quizzes, open houses, etc.



- The manner, text, language and frequency for display of vital information could be enshrined in the Rules.
- The OTT industry associations could be mandated to run periodic campaigns in print and electronic media about the grievance redressal mechanism.
- The interpretation of age rating (UA 13+, for example) and the content descriptors ('violence', for instance) could be in the respective languages of the video (apart from English). Such provisions are embedded in law for the display of anti-tobacco messages in films.



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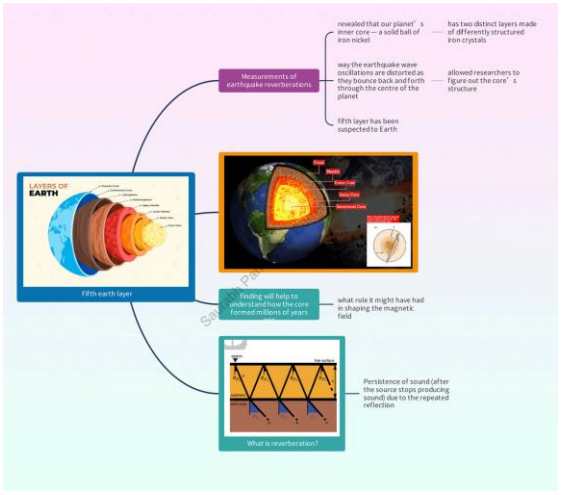
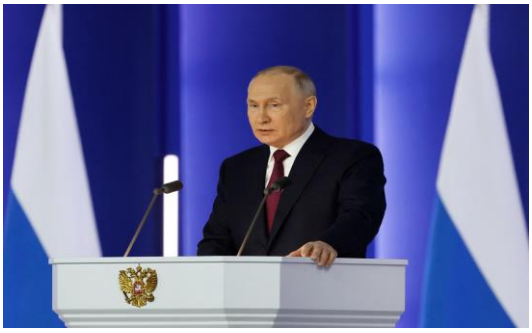


THE HINDU

New start treaty

What is the New START nuclear treaty?

- The Strategic Arms Reduction Treaty (START I), signed in 1991, expired in late 2009 and another treaty, the Strategic Offensive Reductions Treaty (SORT or Moscow Treaty), was signed in 2002.
- However, the New START treaty replaced the 2002 pact and was the last remaining nuclear weapons control agreement between the two powers who together hold 90% of the world's nuclear arsenal.
- The New START treaty was signed in 2010 by former U.S. President Barack Obama and Russian President Dmitry Medvedev and came into force in February 2011.
- It was extended for five years when current U.S. President Joe Biden took office in 2021. Under the Treaty,
- America and Russia cannot deploy more than 1,550 strategic nuclear warheads and more than 700 long-range missiles and bombers.
- It also limits each country to 800 deployed and non-deployed launchers and delivery vehicles.
- Additionally, it allows each side to carry out up to 18 short-notice (32 hours) on-site inspections of strategic nuclear weapons sites annually to ensure that the other country had not crossed the limits of the treaty.
- Under the agreement, Russia and the U.S. exchange data twice a year on ballistic missiles under the treaty's purview and on bombers, test sites, nuclear bases etc.
- The treaty also mandates the two parties to send notifications within five days if they change or update something in their stockpile, like moving missiles to a new base or deploying a new warhead to the system

- **Why did the Russian President suspend New START?**
- "I am forced to announce today that Russia is suspending its participation in the strategic offensive arms treaty,"
- Mr. Putin said on February 23. He said the North Atlantic Treaty Organisation (NATO) and the U.S. wanted to "inflict 'strategic defeat' on Russia and "try to get to our nuclear facilities at the same time.
- 

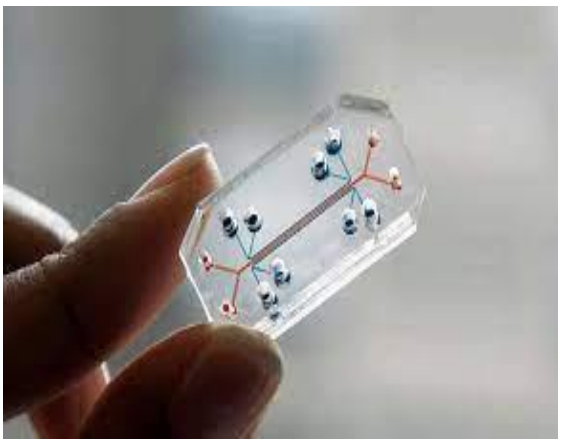
Will it trigger an arms race?

- Notably, since Mr. Putin has not withdrawn from the treaty and just 'suspended' it, which is a term not defined in the official pact, analysts are saying the move would not immediately trigger an arms race between the two powers and could be a part of Russia's political messaging amid the West's massive assistance to Ukraine amid the year-long conflict.

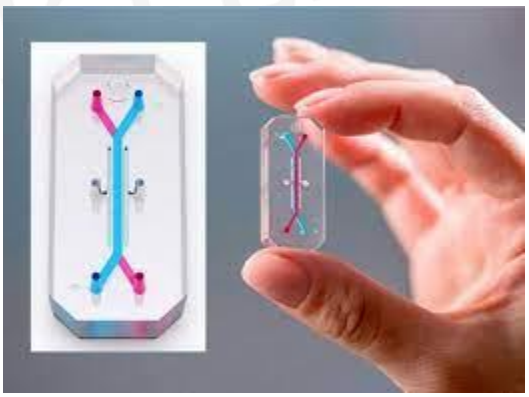
THE HINDU

Organ on chips

- An organ-on-a-chip (OOC) is a multi-channel 3-D microfluidic cell culture, integrated circuit (chip) that simulates the activities, mechanics, and physiological response of an entire organ or an organ system
- It constitutes the subject matter of significant biomedical engineering research, more precisely in bio-MEMS. The convergence of labs-on-chips (LOCs) and cell biology has permitted the study of human physiology in an organ-specific context



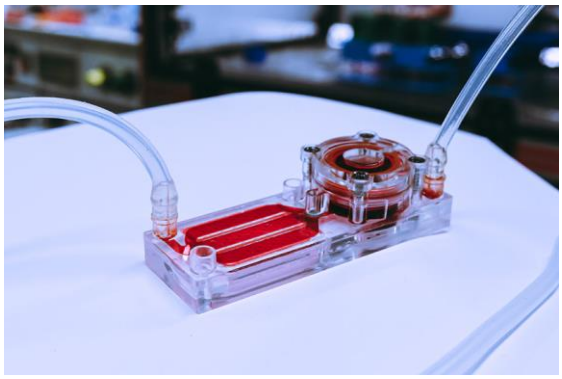
- Bio-MEMS is an abbreviation for biomedical (or biological) microelectromechanical systems. Bio-MEMS have considerable overlap, and are sometimes considered synonymous, with lab-on-a-chip (LOC) and micro total analysis systems (µTAS).



- A lab-on-a-chip (LOC) is a device that integrates one or several laboratory functions on a single integrated circuit (commonly called a "chip") of only millimeters to a few square centimeters to achieve automation.

Brain-on-a-chip

- Brain-on-a-chip devices create an interface between neuroscience and microfluidics by 1) improving culture viability; 2) supporting high-throughput screening; 3) modeling organ-level physiology and disease.



THE HINDU