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WHAT IS TUNGSTEN?

- Tungsten is a **chemical element** with the symbol **W**, and **atomic number 74**.



- Classified as a **transition metal**, Tungsten is a **solid at room temperature**.
- It is a **naturally occurring element**. It occurs in rocks and minerals combined with other chemicals, but **never as a pure metal**. It is found in nature in **mineral forms like wolframite and scheelite**.
- **Elemental tungsten** is a **white to steel gray metal** (depending on the purity) that can be used in pure form or mixed with other metals to make alloys.
- **Features:**
 - **One of the densest metals**, with a density of 19.3 g/cc
 - **Highest melting point of all metals** at 3410 °C
 - Lowest vapor pressure of all metals with 4.27 Pa at 3410 °C
 - **Highest tensile strength of all metals** over 1650 °C
- **Uses:**
 - **Tungsten alloys** tend to be **strong and flexible**, **resist wear**, and **conduct electricity well**.
 - Tungsten is used in products such as **x-ray tubes**, **light bulbs**, **high-speed tools**, **welding electrodes**, turbine blades, golf clubs, darts, fishing weights, gyroscope wheels, phonograph needles, **bullets**, and **armor penetrators**.
 - reactions.
 - Chemical compounds of tungsten are used for many purposes.
 - **Cemented tungsten carbide** is a **hard substance** used to make **grinding wheels and cutting or forming tools**.
- **Major producers:** **China** (dominates global production), **Vietnam**, **Russia**, and North Korea.
- It has been **classified as a Critical Mineral** by the Government of **India**.



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KEY FACTS ABOUT LOTHAL



- Lothal is an excavated site situated in the **Bhal region** in Dholka, Ahmedabad, Gujarat.
- It is one of the prominent cities of the ancient **Indus Valley civilization (IVC)**. The origin and history of Lothal can be dated back to **2400 BC**.
- Lothal was one of the **southern cities of the IVC**, located in the **Gulf of Khambat region**.
- It is the **only port town of the IVC**.
- Lothal was **discovered by SR Rao**, an Indian archaeologist, in **1954**.
- Literally called '**Mound of the Dead**', this ancient and desolate ruined city of Lothal provides insight into the life of the Harappan culture and the IVC.
- Like other cities of the Indus Valley Civilization, Lothal too had **excellent architecture and town planning**.
- Excavations have revealed that the **town was divided into two parts**.
 - The **upper part, or acropolis**, was where the **ruler and other important people** of the city lived, while the **lower part** was meant for the **common people**.
- The entire city had a **scientific drainage system**, well-laid **paved roads**, and a **bath for every house**, some of which were **double-storied** and **built on mud platforms**.
- The most architecturally sophisticated part of Lothal was its **dockyard**, which provided **berthing facilities** for the ships.
 - It is the **world's oldest known artificial dock**, which was **connected to an old course of the Sabarmati River**.
- Lothal has enjoyed the status of being the **leading center of trade** in bygone times.
- The **ruins of a fire altar** suggest that the **people of Lothal worshipped the fire god** along with the **sea god**.



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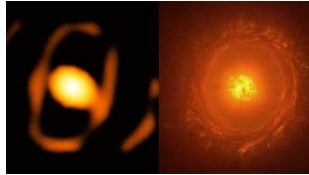
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WOH G64 STAR



- It is the **massive star** that has been imaged with remarkable sharpness by the **European Southern Observatory's Very Large Telescope Interferometer** (ESO's VLTI).
- It dwells in the **Large Magellanic Cloud**, a dwarf or satellite galaxy that orbits our Milky Way, which also happens to be one of the closest galaxies to us.
- It was **discovered in the 1970s** by Bengt Westerlunds, Olander, and Hedin. Incidentally, the WOH in its name is the acronym for the names of its three discoverers.
- The star is believed to be **around 1,60,000 light years away from Earth**.
- It is **classified as a red supergiant** owing to its size, which is roughly 2,000 times that of the Sun.
- The new photo has revealed that WOH G64 is **entering the last stages of its life**. In recent years, the star has blown off its outer layer, and it is now surrounded by wreaths and arcs of gas and dust.

What are Magellanic Clouds?

- These are irregular **galaxies that share a gaseous envelope** and lie about 22° apart in the sky near the south celestial pole.
- They are comprised of two irregular galaxies, the **Large Magellanic Cloud (LMC)** and the **Small Magellanic Cloud (SMC)**, which orbit the Milky Way once every 1,500 million years and each other once every 900 million years.
- These companion galaxies were named for the Portuguese navigator Ferdinand Magellan, whose crew discovered them during the first voyage around the world (1519–22).
- Magellanic Clouds were formed at about the same time as the Milky Way Galaxy, approximately 13 billion years ago.
- They contain **numerous young stars and star clusters**, and some much older stars.

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ATMANIRBHAR CLEAN PLANT PROGRAMME



- It is designed to address critical issues in horticulture by **providing access to high-quality, virus-free planting material.**
- **The Program will aim to:**
 - Enhance the yield of horticulture crops,
 - Disseminate and adopt climate resilient varieties,
 - Protect the ecosystem through proactive virus and disease control measures.
- **Components**
 - Under this programme 9 world class **state-of-the-art Clean Plant Centers (CPCs)** equipped with advanced diagnostic therapeutics and tissue culture labs.
 - A robust certification system will be implemented to ensure thorough accountability and traceability in planting material production and sale.
 - It also prioritizes affordable **access to clean plant material** for all farmers, actively engages women farmers, and addresses the diverse agro-climatic conditions across India by developing region-specific clean plant varieties and technologies.

Implemented by: Ministry of Agriculture and Farmers Welfare through the **National Horticulture Board (NHB)** and the **Indian Council of Agricultural Research.**

Significance: The programme is poised to deliver numerous benefits across various stakeholders, from farmers to consumers, and bolster India's position in the global fruit market.



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EXERCISE AGNI WARRIOR



Recently, the 13th edition of Exercise AGNI WARRIOR (XAW-2024) concluded at Field Firing Ranges, Devlali (Maharashtra).

- It is a **joint military exercise** between the **Indian Army and Singapore Armed Forces**.
- It witnessed participation by the Singapore Armed Forces contingent comprising personnel from the Singapore Artillery and the Indian Army contingent personnel from **the Regiment of Artillery**.
- The aim of XAW-2024 was to **maximise mutual understanding of drills** and procedures to achieve jointness as a multinational force under the United Nations Charter.
- The exercise showcased joint firepower planning, execution and use of New Generation Equipment by the Artillery of both Armies.
- The exercise involved extensive joint preparation, coordination, understanding of each other's capabilities, procedures and evolution of common interface between Indian and Singapore Artillery procedures.
- It marked the culmination of successful training by Singapore Armed Forces troops exposing them to **intricacies of Fire Power planning**. Both sides utilised niche technologies during the exercise and exchanged best practices as part of the joint training.

CYCLONE FENGAL MAKES LANDFALL

Cyclone Fengal made landfall near Puducherry on November 30, bringing heavy rainfall and gusty winds to Tamil Nadu's coastal belt, including Chennai and Puducherry. This is the second cyclone to impact India's east coast in two months after Cyclone Dana.

Cyclone Fengal, initially stagnant, intensified as it moved closer to land, reaching about 120 km east of Puducherry and 110 km southeast of Chennai before landfall.

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The cyclone made landfall between Mahabalipuram and Karaikal with wind speeds of 70-80 km/hr, gusting to 90 km/hr. Heavy rainfall and gusty winds disrupted public transport, with buses, trains, and flights affected.

What is a Cyclone?

- A cyclone is a large-scale system of air that rotates around the centre of a low-pressure area. It is usually accompanied by violent storms and bad weather.
- A cyclone is characterised by inward spiralling winds that rotate anticlockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.
- **Characteristics of a Tropical Cyclone:**
 - The **centre of a cyclone is very calm and clear with very low air pressure**. The average speed is **120 kmph**.
 - They have closed **isobars** which leads to greater velocity.
 - Isobars are imaginary lines on a weather map that connect locations with equal atmospheric pressure.
 - They develop over oceans and sea only.
 - They move from east to west under the influence of trade winds.
 - They are seasonal in nature.
- **Classification of cyclones**
 - Cyclones are classified **on the basis of wind speed** by the Indian Meteorological Department (IMD):
 - **Depression:** Wind speeds of between 31–49 km/h
 - **Deep Depression:** Between 50-61 km/h
 - **Cyclonic Storm:** Between 62–88 km/h
 - **Severe Cyclonic Storm:** Between 89-117 Km/h
 - **Very Severe Cyclonic Storm:** Between 118-166 Km/h
 - **Extremely Severe Cyclonic Storm:** Between 167-221 Km/h
 - **Super Cyclonic Storm:** Above 222 Km/h



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What does landfall of a cyclone mean?

- Landfall is the event of a tropical cyclone coming onto land after being over water.
- As per the IMD, a tropical cyclone is said to have made a landfall when the center of the storm – or its **eye** – moves over the coast.
 - The "eye" of a cyclone is a region of relatively calm weather found at the center of the storm.
 - It is a circular or oval-shaped area characterized by light winds, clear or partly cloudy skies, and decreased precipitation.
 - Within the eye, winds are light and variable, often with clear or only partially cloudy skies.
 - The size of the eye can vary significantly, ranging from a few kilometers to over 50 kilometers (30 miles) in diameter in larger cyclones.
- During landfall, the outer bands of the storm may have already reached the coast, bringing strong winds, heavy rain, and storm surge.
- Landfall marks the moment when the cyclone officially reaches the land.
 - A landfall should not be confused with a 'direct hit', which refers to a situation where the core of high winds (or eyewall) comes onshore but the centre of the storm may stay remain offshore.

Bay of Bengal: a cyclone hotspot

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 - Historical data underscore Bay of Bengal's predisposition to cyclones, with approximately 58% of them making landfall on India's eastern coast, compared to just 25% in the Arabian Sea.
- The Arabian Sea gets fewer cyclones due to its narrower and deeper nature, cooler water and higher salinity. Its partially landlocked geography also contributes to reduced cyclonic activity.

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ROAD ACCIDENT FATALITIES IN INDIA

Key Causes for Road Accidents:

- **Human Behaviour:**
 - The Minister emphasized that **human error** is the leading cause of accidents, driven by **disregard for laws** and unsafe practices like over-speeding and reckless driving.
 - **Over-speeding** accounted for **68.1%** of road crash deaths in 2023.
- **Helmet and Seatbelt Non-Usage:**
 - **54,000 deaths** were attributed to not wearing helmets.
 - **16,000 fatalities** occurred due to seatbelt non-compliance.
- **Pedestrian and Two-Wheeler Vulnerability:**
 - Pedestrians accounted for **20%** of road crash fatalities.
 - Two-wheeler users made up **44.8%** of fatalities.
- **Infrastructure Deficiencies:**
 - Gadkari acknowledged the presence of **potholes**, lack of **underpasses**, and insufficient **foot overbridges**, which significantly contribute to accidents.
 - **Black spots** (high-risk areas) on national highways are being addressed with a **₹40,000 crore budget** for rectification.
- **Other Factors:**
 - **Overloaded vehicles:** Accounted for **12,000 deaths**.
 - **Unlicensed driving:** Contributed to **34,000 crashes**.
 - **Old vehicles and outdated technology:** Further exacerbated risks.

Global Context & Learnings:

- India's road safety challenges are among the most severe globally.
- According to the **World Bank**, poor road infrastructure, coupled with rapid urbanization and increasing vehicular traffic, exacerbates the problem.

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- Countries like **Sweden** and the **Netherlands** have successfully implemented the **Vision Zero initiative**, targeting zero road fatalities through stringent policies and advanced road designs.
 - India can adopt similar approaches to create safer roads.
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THE FALLOUT OF BANGLADESH EVENTS

On November 25, Chinmoy Krishna Das, spokesperson for the Bangladesh Sammilita Sanatani Jagaran Jote, was arrested in Dhaka while traveling to Chittagong. He was charged with sedition for allegedly disrespecting Bangladesh's national flag during an October 25 rally and was subsequently sent to police custody.

Minority communities in Bangladesh

- Bangladesh has an ancient Hindu and Buddhist population, and in recent decades has also acquired a thriving Christian community.
- These minorities were united under the Bangladesh Hindu Bouddho Christian Oikyo Parishad (BHBCOP) during Khaleda Zia's tenure as Prime Minister in 1991.
- Analysts have highlighted increasing discrimination and atrocities against religious minorities over the years.
- Despite appeals, successive governments have failed to address these issues, fueling frustration among younger community members and paving the way for leaders like Chinmoy Krishna Das.

Impact on India-Bangladesh ties

- **Strained India-Bangladesh Relations Under the Yunus Government**
 - The interim Yunus government is seen as a setback for India's Bangladesh policy, given Ms. Hasina's warm ties with India.
 - **Impact on India-Backed Projects**
 - India-backed initiatives, including the Adani Group's Godda power plant project, have been affected.
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