



KNOWBEL

KNOW BEL

ENLIGHTENING THE NOBLES!



It is the supreme art of the teacher to awaken joy in creative expression and knowledge.

- Albert Einstein

SEPTEMBER 2020 • ISSUE NO. 9



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WELCOME !

To the 9th issue of KNOWBEL.

Here comes the latest edition of your favourite magazine, KNOWBEL. Dive into the world of fascinating articles, inspiring personalities, mind-blowing quizzes, adorable comics and a lot more. All it takes is the flip of a page.

We firmly believe that everyone must have access to information and hence, strive to include the choicest of material for you to dwell upon. Besides, we provide a wonderful platform for you to showcase your amazing talent. You can send us your creative work at knowbel.science@gmail.com.

Moreover, don't forget to participate in the quizzes and contests we host because who knows, you may be the next star to win some exciting prizes and a feature in our next issue. Do share this with your friends and family. A candle loses nothing by lighting up another one.
Happy reading!

Stay home & Stay safe !

SPECIAL THANKS TO

DR. APARNA DESHPANDE
Faculty Advisor

KNOWBEL

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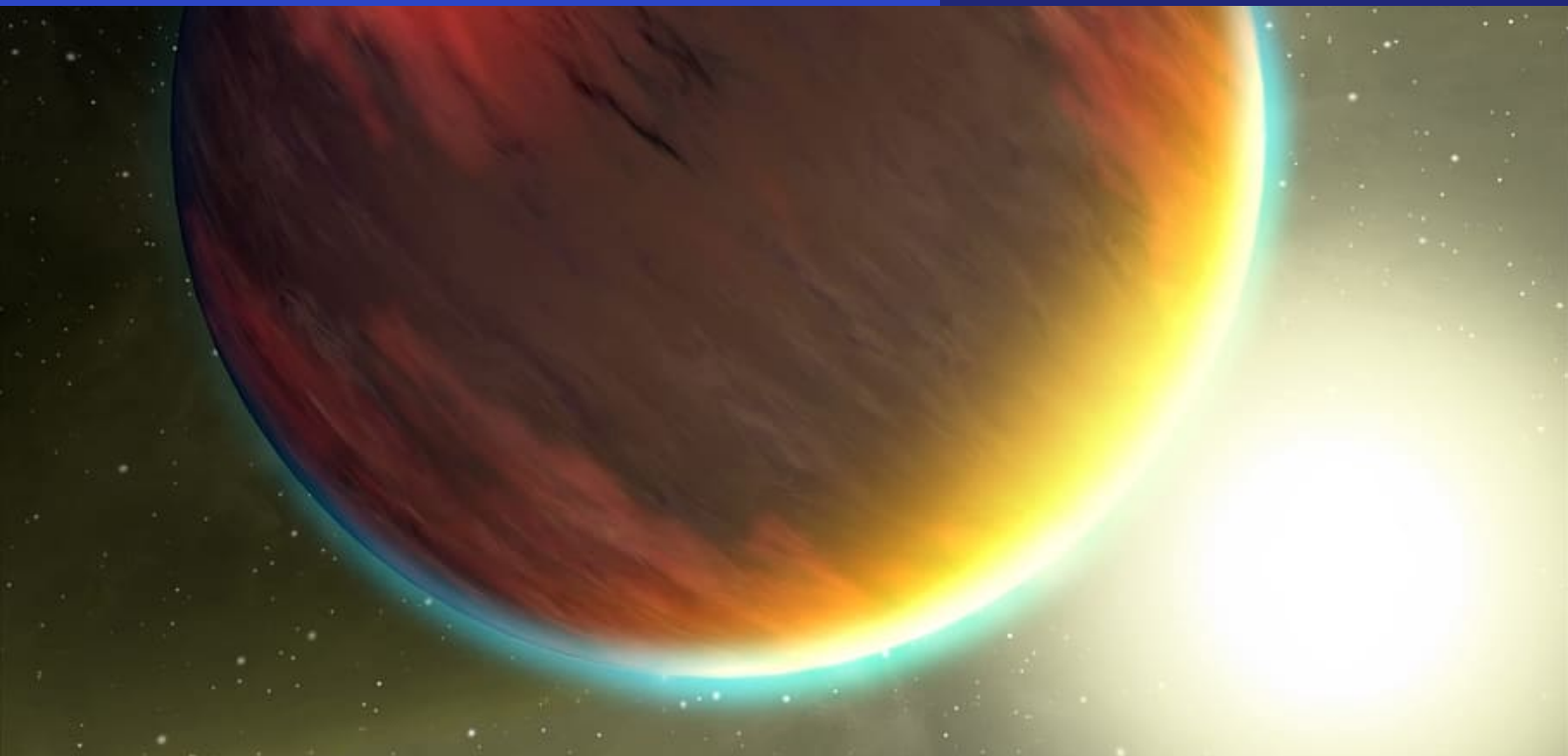
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WONDERELLA



Never Stop Questioning !



SOURCE: PIQSELS

HELLO, ALIENS?

Humans have pondered about the existence of life-forms outside the Earth, and numerous caricatures of extra-terrestrial "aliens" have found their way into popular culture and media. While life existing outside Earth has not been detected to date, several attempts are being made to identify and establish contact with life-forms that could potentially exist outside the Earth. A novel method has been developed recently in this direction.

Astronomers are beginning to analyse the light scattered from a planet's atmosphere to search for signs of life. The light from the planets interacts with the gases in its atmosphere. This can reveal information about the composition of the atmosphere. Some gases such as methane, oxygen and ozone are considered to be strong indicators of the presence of life, and are known as 'biosignatures'. To further aid in the detection of these gases, scientists from the EPFL and Tor Vergata University of Rome have developed a statistical model to interpret the results. The analysis will primarily be conducted on exoplanets - planets which orbit a star other than the Sun. The technique of using gas spectroscopy to detect biosignatures is expected to become an essential part of astronomy in the coming years.

RIVETING READS IN THIS ISSUE:

02 - LOW-COST ICU VENTILATORS DEVELOPED AT IISER PUNE

03 - THE CHEMICAL EXPLOSION IN BEIRUT

04 - MATH AND PENGUINS

05 - WHAT HAPPENS TO WHITE BLOOD CELLS WHEN THEY 'EAT' FOREIGN PARTICLES?



References -

- actu.epfl.ch

02 - LOW-COST ICU VENTILATORS DEVELOPED AT IISER PUNE

The novel coronavirus SARS-CoV-2 is known to infect the airways and cause difficulty in breathing. In severe cases, artificial respiration employing a ventilator may be necessary to sustain normal breathing in patients. Noting the importance of ventilators in treating critical cases of the disease and the shortage of sophisticated ventilators in hospitals, a team of scientists from IISER Pune designed a new low-cost ventilator that could be assembled using readily available parts.

The team consists of Dr Umakant Rapol, Dr Sunil Nair (both faculty members at IISER Pune), technical officer Nilesh Dumbre, as well as IISER Pune alumni Sainath Motlakunta (now a PhD student at the Institute for Quantum Computing, Waterloo, Canada) and Dr Mohammad Noaman (now a Postdoctoral Fellow at the University of Southern Denmark, Odense, Denmark). Despite the hurdles of remote collaboration and non-availability of materials due to the lockdown, the team set up a functional version of the ventilator in three weeks. The ventilator project began when the International office at IISER got in touch with Dr Umakanth Rapol to help design a mechanical ventilator known as the 'Bharucha ventilator'. They soon realised that a mechanical device would not be sufficient for the use of COVID-19 patients. By combining two open-source designs (one from Milan and the other from Florida), the team developed a new hybrid version that could be built using readily available materials at a low-cost (the estimated cost of the new ventilator is somewhere between 30, 000 and 40,000 INR).

The new ventilator comes with several additional features that make it well-suited for use in the current situation. These include the option to control the ventilator remotely using a phone, and more filters in the output tube to contain bacteria and viruses. A Memorandum of Understanding (MoU) was signed by IISER Pune and Accurate Gauging & Instruments Pvt. Ltd. on August 4, 2020, transferring the technology to the latter. The industrial partner will now build prototypes for regulatory approval, and later mass-produce the final version of the ICU ventilator for use in hospitals.



SOURCE - YOUTUBE



References -

- www.iiserpune.ac.in/news/
- <http://www.iiserpune.ac.in/news-events/>
- www.youtube.com
- indianexpress.com
- www.openbreath.tech/

03 - THE CHEMICAL EXPLOSION IN BEIRUT

The devastating explosion that happened in Beirut has been linked to a stockpile of ammonium nitrate that was stored in the city's port. Understanding the nature of this explosive chemical can help prevent such incidents from happening in the future. Ammonium nitrate (NH_4NO_3) is a white crystalline solid that is widely used in agriculture as a high-nitrogen fertiliser.

Due to its use in agriculture, it is produced in several tonnes a year. The compound can be stored safely in its pure form, and it decomposes non-explosively into nitrous oxide and water on heating at low temperatures (below 300°C).

However, under certain conditions, the heat liberated on heating ammonium nitrate can further catalyse the decomposition of the compound. This runaway process generates a surge of energy which can result in a massive explosion. The incident at Beirut is not the first of its kind, and there have been similar chemical explosions in the past in Spain, France and the United States. These incidents will hopefully convince governments across the world to implement strict policies while handling explosive and poisonous chemicals.



SOURCE: WIKIMEDIA



References -

- www.nbcnews.com
- wikipedia.org

04 - MATH AND PENGUINS

As winter strikes and cold winds blow across the Southern Antarctic continent, emperor penguins can be seen huddling together in large congregations to conserve body heat. Although one would expect these large huddles to be disorderly and chaotic, researchers who have studied the penguins describe these huddles as "ordered chaos". Why is this so? Each penguin attempts to move around in the huddle to find a location of favourable warmth. The combined effect of all these movements results in the formation of an orderly pattern. The movement of each penguin is simple. If the wind is directly blowing on to a penguin, it moves to the other side of the huddle to seek shelter against the incoming wind. Another penguin takes its spot and soon moves to the other side too. The penguins that were at the centre of the huddle eventually get exposed to the cold wind as the formation shifts and this occurs multiple times. Ultimately, the cluster transforms into a continually changing oblong-shape with rounded edges. Surprisingly, it turns out that the shape that the congregation of penguins assumes is the mathematically optimal one. Depending on the ambient temperature, scientists have devised very accurate models to predict the size and shape of the penguin huddling group. This modelling has additional implications. If there are deviations from the expected shape and form, it becomes possible to indirectly measure the average fat content and energy reserves of the penguins. This type of analysis is quite powerful. To measure the average fat content of the penguin population, one simply has to take a photograph of the huddling penguin crowd, instead of measuring the weights of the individual penguins. This is one demonstration of how a well-calibrated mathematical model can offer powerful insight into the nature of the population.



SOURCE: WIKIMEDIA

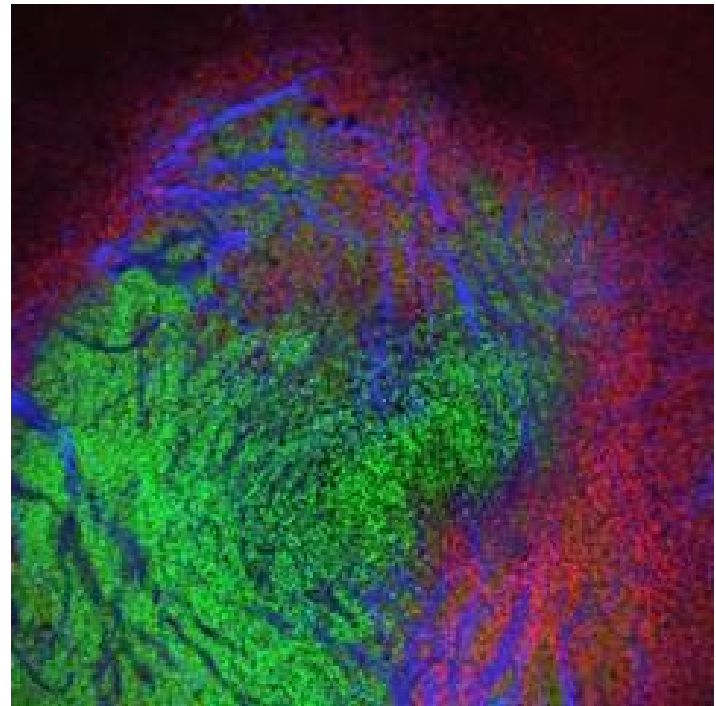


References -

- www.quantamagazine.org

05 - WHAT HAPPENS TO WHITE BLOOD CELLS WHEN THEY 'EAT' FOREIGN PARTICLES?

One of the several groups of cells that constitute the immune system is the group called 'macrophages'. These cells continuously patrol the body and eliminate foreign particles and dying cells by surrounding and digesting them. These cells are at the frontline of the immune system and play a vital role in keeping the body safe against foreign pathogens. The macrophages must undergo significant deformation to surround the pathogen. This is achieved by rearrangement of the cell's actin fibres. These fibres are tiny supports that constitute the skeleton of the cell and lend it structure. During deformation, the actin fibres disassemble at one place and rapidly reassemble at the other location. If the reassembly is not done quickly, the cell may stiffen. Recent studies conducted at the Indian Association for the Cultivation of Science (IACS), Kolkata, have shown that a certain reactive oxygen species (ROS) has been found to hamper the ability of actin fibres in macrophage cells to reassemble shortly after ingestion. Due to the increased ROS concentration in the cell, the macrophages may not be able to ingest another particle for up to 8 hours. This is an intriguing observation, and several other questions stem from this. Does this delay in ingestion have any benefits to the pathogen or the host? It would be interesting to investigate this phenomenon and find answers to these questions.



SOURCE: VISUALSONLINE.CANCER.GOV



References -

- indiabioscience.org

FACTASTIC!

Get ready to guzzle down these interesting facts...



आशीष भटनागर / CC BY-SA

Savitribai Phule was the first female teacher of the first women's school in India and is considered the pioneer of modern Marathi poetry. In 1852, she opened a school for untouchable girls.

She is remembered as one of the greatest icons of social reform in India.

Along with her husband, Jyotirao Phule, she pioneered the cause of girls' education in India. In 1948, they founded the country's first girls' school in Pune. She was also an esteemed poet and fought extensively for the rights of girls and women.

History reveres Sage Valmiki as 'Adi Kavi' (first poet) for writing the Ramayana. The epic is composed of 24,000 shlokas, and seven 'Khandas', including the 'Uttara Khanda'. It consists of a total 4,80,002 words. Through it, Valmiki imparts to humankind the invaluable teachings of loving and respecting one's family, the importance of siblings, distinguishing between the right and the wrong, and predominantly, the victory of good over evil.



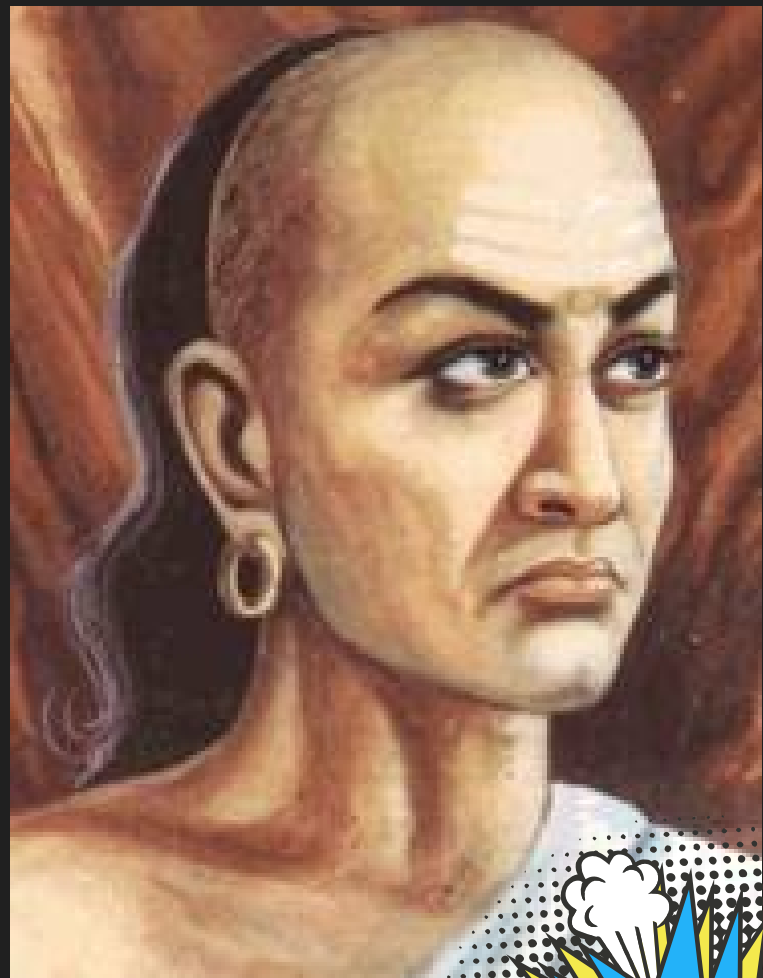
Tej Kumar Book Depo / CC0



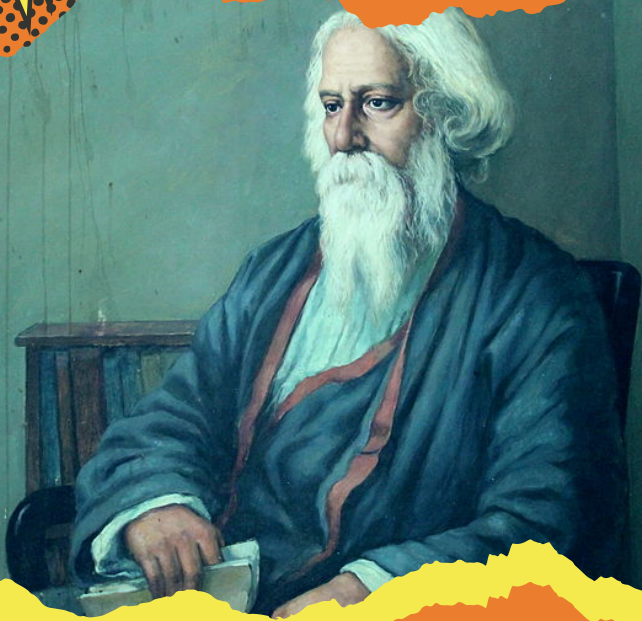
Ramanarayanadatta astri / Public domain

The Mahabharata states that Dronacharya was the Guru of Kauravas and Pandavas. He was the master of advanced military arts, including the Astras. Therefore, he was appointed by the princes' great grandfather, Bheeshmapitahmah, to educate them about archery and warfare. Legend has it that Arjun was Dronacharya's favourite pupil because he was the most dedicated, hardworking, and naturally talented. Arjun surpassed Drona's expectations in several challenges and paid homage by assiduously serving his teacher.

Chanakya, also known as Kautilya, was an Indian teacher, philosopher, jurist and royal advisor to Chandragupta Maurya, the ruler of the Magadha Empire. He is known to be the best teacher and strategist born and raised on Indian soil. He wrote two books, namely 'Arthashastra' and 'Neetishastra' (Chanakya Niti). These works are highly regarded in the field of economics and politics and discuss monetary and fiscal policies, welfare and international relations, and strategies of war in detail.



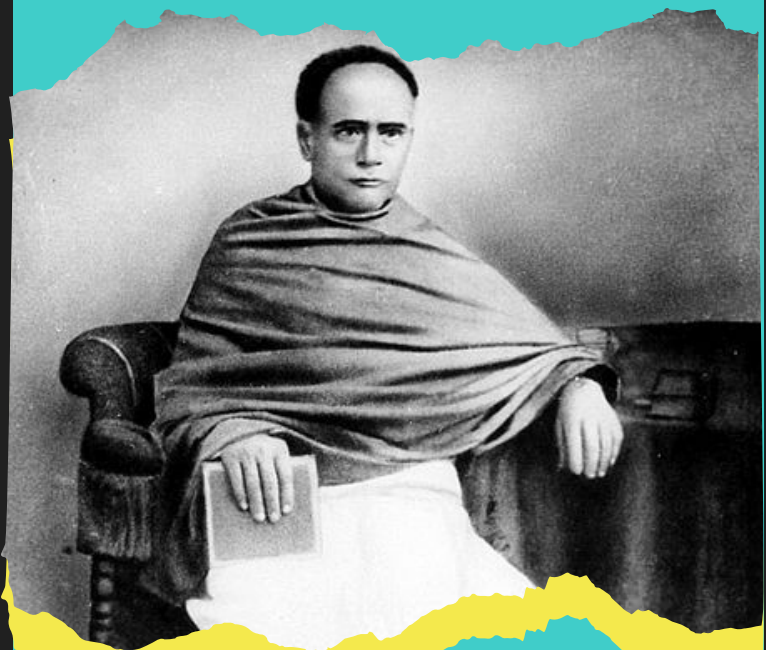
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Rabindranath Tagore is a well-known Indian poet and teacher revered for his scholar-like excellence. Being home educated, he advocated learning by activities as a map to develop the physical and mental capabilities of a child. His methods included teaching through tours and trips, narrations, debates, discussions, the heuristic method, etc.

Ishwar Chandra Vidyasagar introduced the practice of widow remarriage and pushed for the Widow Remarriage Act XV of 1856. He reconstructed the Bengali alphabet and reformed Bengali typography into an alphabet (an abugida) of twelve vowels and forty consonants. He was born as Ishwar Chandra Bandyopadhyay. He received the title of 'Vidyasagar', which means 'An Ocean of Knowledge', from the Sanskrit College at Calcutta (from where he graduated), due to his excellent performance in Sanskrit and philosophy. He was an Indian Bengali polymath and played a pivotal role in the Bengal Renaissance.



Wikimedia / Public domain

References:

- kactivist.org
- www.floweraura.com
- www.indiatoday.in

Fact Finder

MRUNAL

The Quizopedia

ARE U READY TO GET THOSE COGS RUNNING!

Is your mind slowly going stale, all with this never-ending quarantine and having nothing to do. Did you pride yourself on being the 'Know-it-all' in your class? Well, here's a chance to flex your grey cells and bring them back to tip-top shape. KNOWBEL presents the Quizopedia. I, Aditya, the quizmaster, have selected 15 of the most sizzling questions for you to crack. Note that 10 of these questions are related to the theme of this month's issue, while five are related to the previous month's issue.

Check out the instructions below:

The QR code will take you to a Google Form, which contains a quiz consisting of 15 questions. You must answer all the questions and try to get them correct. This time, in an attempt to make the quiz more exciting, there are no options. You are free to make wild guesses as there is no negative marking! However, don't even try cheating as it would not help you in any way to reach the answer! The names of the winners would be published in the upcoming issue, and the winner of the contest will get prizes worth Rs. 250 at the end of the contest. Apart from that, all participants would be sent E-certificates to their respective email IDs. Answers would be officially released via mail on September 25, 2020.

(The competition begins on September 2, 2020, at midnight).

The winners would be chosen based upon the following criteria:

1. Number of Correct Answers
2. Time of Submission

Last Date for Submission: September 20, 2020

What are you waiting for? Let's get quizzing!

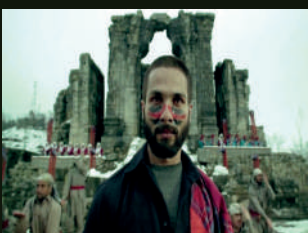
1) Let's start with an easy one! Fill in the blanks.

India consists of ___ states and ___ union territories!
(Separate the two answers with a comma , for example: 12,5)

2) Fill in the blanks.

_____ is one of India's greatest music composers. Born as A S Dilip Kumar, he changed his name to _____ while converting to Islam. He has won many awards including two Oscars and Grammys. He was awarded the Padma-Bhushan by the Indian government in 2010.

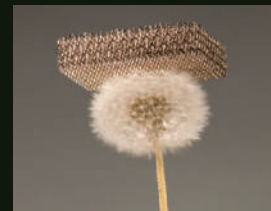
3) Apply funda to connect these three movies ;)



4) In 1987, Chetan Sharma became the first cricketer to take a hat-trick in the ODI World Cup. Since then ten cricketers have achieved this remarkable feat. Who is the latest in the list ?

5) Micro-lattice is the lightest metallic structure ever made. Composed of a nickel-phosphorus alloy, its density is as low as 0.9 g/cc. Which company made this ?

(Hint: Think about metal objects floating in air ;)



6) 'Ananda math' (The Abbey of Bliss) was a Bengali novel written by Bankim Chandra Chatterjee in 1882. The plot revolves around the disastrous Bengal famine in 1770 and the hardships suffered by the common folk under British Raj. It is considered to be a very important classic in Indian and Bengali literature.

Why does this book hold special significance in Indian history?

7) The major industrial process to produce soda ash (sodium carbonate) was developed by Belgian industrialist Ernest _____. By patenting his invention, he was able to earn large amounts of money that he used in setting up educational institutes and other philanthropic causes.

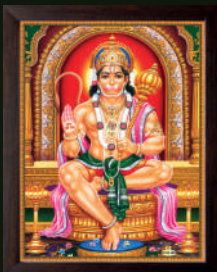
What did he famously establish in 1911, which takes place every three years?



8) In a twitter chat with the Times of India, X revealed that after Richard Harris died, his agent wanted him to audition for the part. The role would finally go to Michael Gambon, who played the role of Y.

Id actor X and famous character role Y.

9) Connect these characters in Indian mythology



10) In the 17th century, X was a small village which formed the boundary between the main city of Bombay and its suburbs. The word X in Marathi means 'boundary' or 'limit' and hence the village was called that. In present Mumbai, that locality has a different name (called Y) but its station still has the old village name.

Id X and Y

11) Fill in the blank.

NASA is going to launch its new mission, ASTHROS (Astrophysics Stratospheric Telescopic for High Spectral Resolution Observation at Submillimeter-wavelengths) in late 2023 from Antarctica. The novel feature of this mission is the use of _____ instead of spacecrafts as a cost-reducing alternative.

12) The Earth's magnetic poles are constantly shifting due to convection currents in the molten outer core of the Earth.

What is this effect called?



13) X was a prominent Indian freedom fighter and later politician. He was supposed to be the first Prime minister of our nation but had to step down because of Nehru. Currently he stands tallest among all the statues in the world.

Identify X.

14) X is an image, video, piece of text, etc., typically humorous in nature, that is copied and spread rapidly by Internet users, often with slight variations. It was coined so as to rhyme with the word Y as both X and Y self-replicate, mutate and respond to selection pressures.

What are X and Y?

15) Teacher's day : Sarvepalli Radhakrishnan :: Sports Day : _____ ?

[Scan or click on QR code below to answer the question:](#)



Winner of quizopedia 8:

Suyog Jare
Inst. :
VIT Pune



< D/CODE >

THERE IS ONLY ONE TRUTH !
BRING OUT THE SHERLOCK IN YOU.

Are you rooting to challenge your brain in this seemingly endless lockdown? Well, we have just the right thing for you. KNOWBEL presents a revamped version of your favourite D-code. Gear up to send your neurons on a marathon.

To begin, scan the QR code or visit the link mentioned below. There are six documents, one leading to another with a clue to open it. You have to submit the final answer, a code given in the final document, at the submission link. Remember, don't give up midway because the solution is staring at you in the face.

Conquistadors will be **honoured** with fantastic **prizes** worth **Rs.250** and **certificates**. Besides, you will get a chance to be featured in our next issue.

The answers will be sent to you by **25/9/2020**. The enthralling **competition begins** on **02/09/2020**. **Hints** would be given out after **5 days** from the **start** of the competition on the official **KNOWBEL website**

here : **HINTS**

The final winners will be chosen on the following basis:

- 1) Your answers (obviously!)
- 2) Logic
- 3) Preference for early-bird submissions

The Deadline for entering your answers is 25/9/2020.

Now, are you ready to EODCD? 😜

Click on **START** to begin.



START

For clarification, please contact: knowbel.decode@gmail.com

D-code - 8 Winner:

1. **Shwetark Kulkarni**
(*Symbiosis Secondary School*)

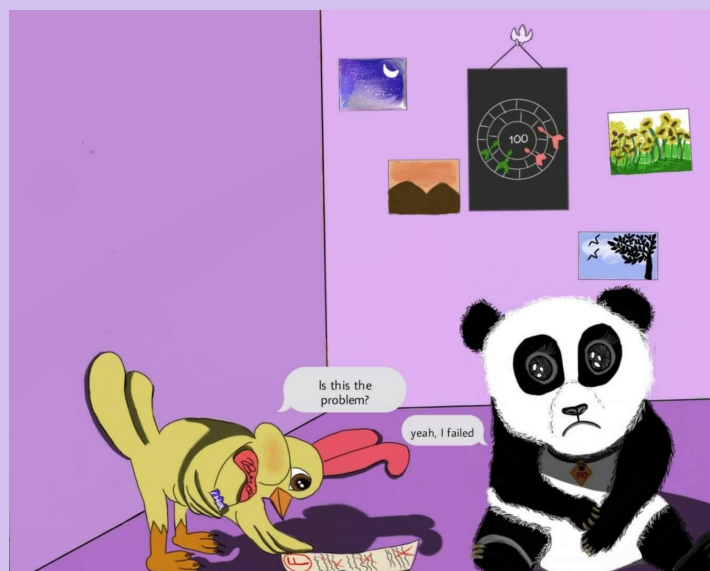


Plot Twist

YOU are a STAR...

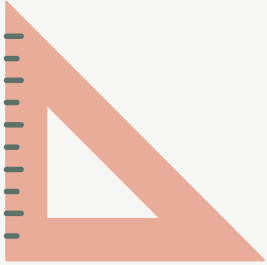
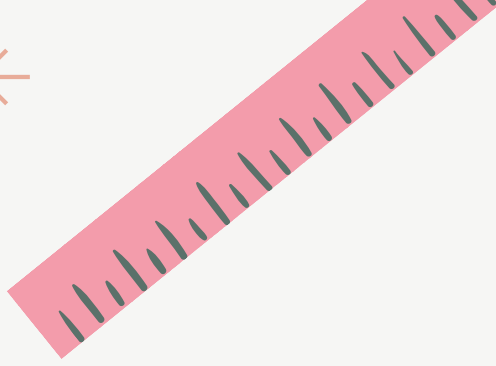


Amidst all the mayhem surrounding the pandemic, KNOWBEL wishes to sneak in some light-hearted moments into your routine. We hope this comic cheers you up.



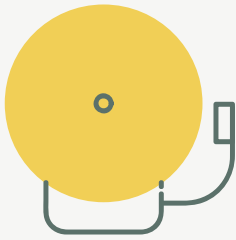
Comics are a fantastic, creative way of conveying your thoughts while keeping a reader entertained. If you are a budding creator, you are always welcome to share your work with us for a feature in the upcoming issue. HAPPY READING!





KNOW BEL

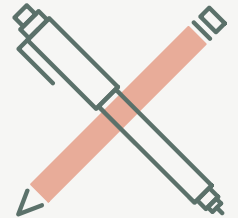
Enlightening the nobles !



ISSUE NO.9 | SEPTEMBER 2020



INSPIRON



Dr Sarvepalli Radhakrishnan

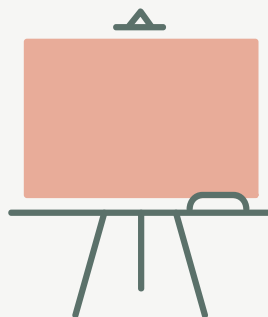
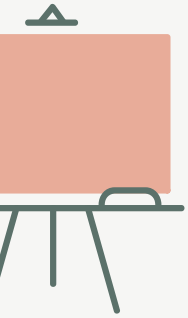




Illustration by Ritu

Who doesn't know the revered scholar, Dr Sarvepalli Radhakrishnan? His students fondly recall him to be adorned in an immaculate long coat and dhoti in the typical South Indian 'panchakatcham' with a medal and turban. He seldom met people in an outfit other than his customary one. Today, it is in honour of this great personality that we celebrate 'Teachers' Day'. It is not unknown that Dr Radhakrishnan was a philosopher, the first Vice-President and second President of India.

01. BRUSHING AGAINST DESTINY

Dr Sarvepalli Radhakrishnan was born into an economically backward family in a village around the border of Tamilnadu and Andhra Pradesh. His father wanted him to turn into a priest at a temple rather than study at an institution, but destiny had other plans. The young Radhakrishnan enrolled into a school at Thiruthani and eventually became one of the most learned Indians. He was awarded scholarships throughout his academic life, owing to his exceptional calibre. He was nominated sixteen times for the Nobel Prize in Literature and eleven times for the Nobel Peace Prize!

02. EFFORTLESS ELOQUENCE

Dr Sarvepalli Radhakrishnan was one of the most celebrated writers in modern India. His work covered a myriad of subjects including philosophical, ethical, theological, social and cultural topics. He also made valuable contributions to reputed international journals. His articles are of immense value, and the depth of his writings still astounds readers today.

WITHIN THESE
PAGES:

- 01** BRUSHING AGAINST DESTINY
- 02** EFFORTLESS ELOQUENCE
- 03** STUDENTS' FAVOURITE
- 04** MATCHLESS COMPASSION
- 05** ELEGANT DIPLOMACY
- 06** SUPREME SAGACITY
- 07** MAGNANIMITY PERSONIFIED



Source: Wikimedia

“

*Books are
the means
by which we
build
bridges
between
cultures.*

”

03. STUDENTS' FAVOURITE

His students adored him. It was September 5 when some of his students approached him for permission to celebrate his birthday. Radhakrishnan was an epitome of humility. Rather than denying their request, he said, "Instead of celebrating my birthday separately, it would be my proud privilege, if September 5 is observed as Teachers' day." From then onward, September 5 has been observed as Teachers' Day, in India. Dr Radhakrishnan was admired for bringing the Indian philosophy to the West. When he decided to leave Calcutta University and transfer to the University of Mysore, the students drove him in a flower-decked carriage to the railway station.

04. MATCHLESS COMPASSION

This incident occurred when Dr Radhakrishnan was the Vice-Chancellor at Banaras Hindu University. It so happened that a student arrived at the campus three days before its reopening. The hostels weren't ready to provide accommodation then. The young lad was not fluent in Hindi or English and hence, was finding it extremely difficult to communicate with the staff. He somehow managed to contact a local guardian who, in turn, notified the administrative department of the college. When Dr Radhakrishnan came to know of the student's predicament, he did not hesitate one bit to call the hostel warden and arrange the student's stay in a room close to his residence! He ensured that the boy's food requirements were taken care of until the hostels were ready. Such was the value he gave to students!

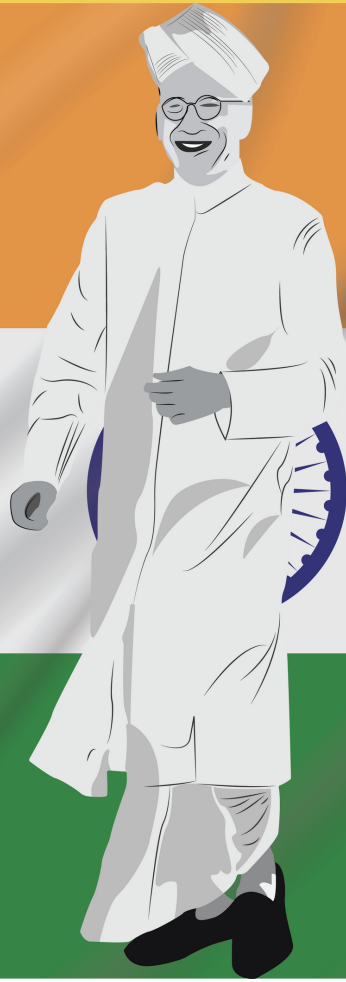


Illustration by Siddharth

05. ELEGANT DIPLOMACY

As the Vice-President, Radhakrishnan had to preside over the Rajya Sabha sessions. Often, during heated debates, Radhakrishnan would intervene with slokas from the Sanskrit classics or quotations from the Bible to calm the charged atmosphere. On noticing his finesse, Nehru once commented, "By the way in which Radhakrishnan conducted the proceedings of the Rajya Sabha, he had made the meetings of the House look like family gatherings!" In 1954, Dr Radhakrishnan was awarded the Bharat Ratna, the highest civilian award in India.

06. SUPREME SAGACITY

It is believed that during a dinner in London, a British citizen remarked that all Indians are black-skinned. Dr Radhakrishnan gently replied, "God once baked a piece of bread more than what was needed, and it was known as the so-called 'negro'. God's next experiment at baking was undercooked, which was known as 'European'. The almighty tried a final experiment where he baked the bread to the ideal extent, and it was termed 'Indian!'."

“

The worst sinner has a future, even as the greatest saint has had a past. No one is so good or bad as he imagines.

”

07. MAGNANIMITY PERSONIFIED

In 1975, towards the end of his life, Radhakrishnan was felicitated with a 'Templeton Prize' by the well-known Templeton Foundation. However, the generous scholar donated the entire amount earned through the Templeton Prize to Oxford University. Even when he became the President of India, he accepted only Rs.2500 out of his Rs.10,000 salary, and the remaining amount was donated to the Prime Minister's National Relief Fund every month. The achievements of Dr Radhakrishnan go beyond the space of this section. He breathed his last on April 17, 1975, but will eternally be remembered for his contribution to the field of education and his efforts to globalise the profound teachings of India.

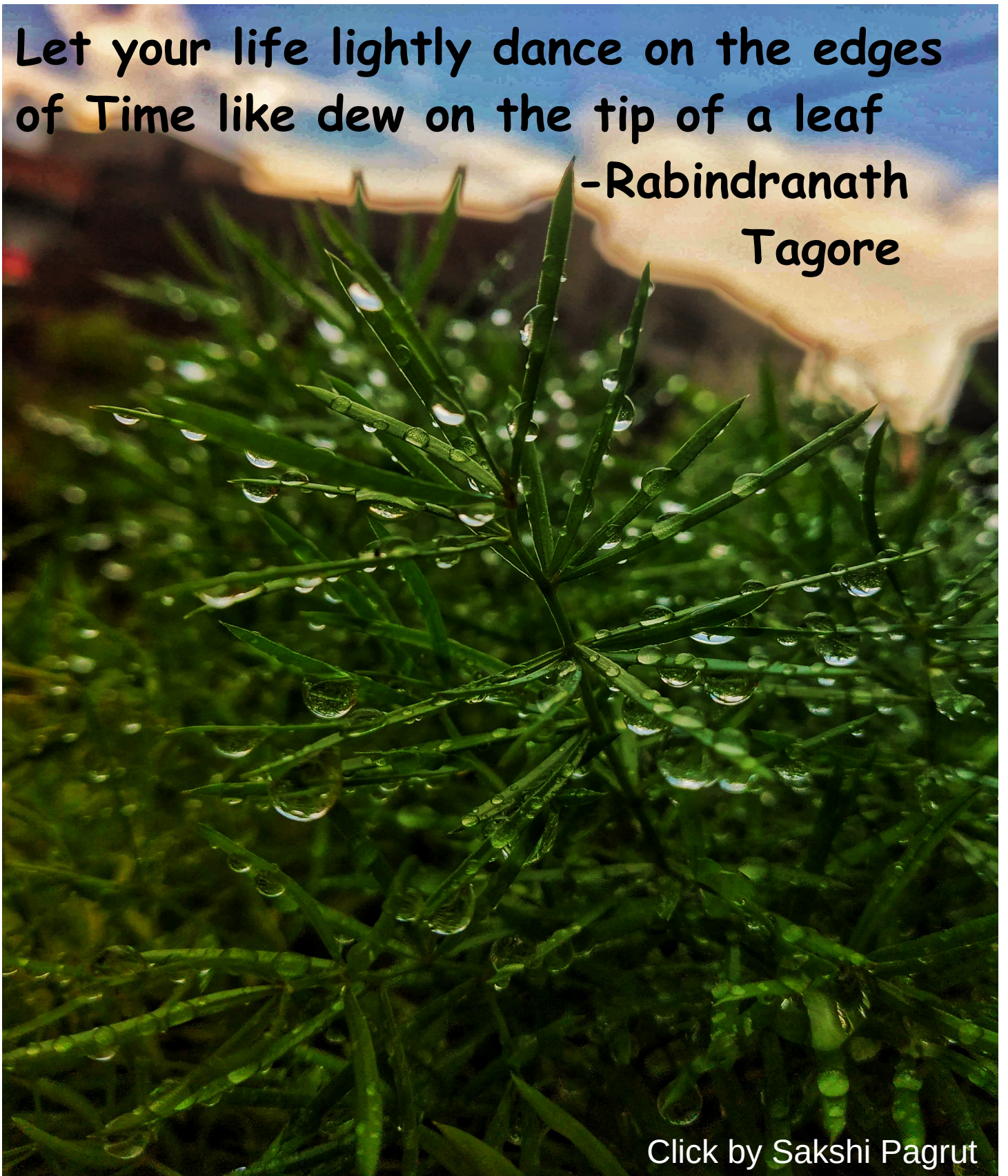
“
*The true
teachers are
those who help
us think for
ourselves.*

”



Illustration by Ritu

Let your life lightly dance on the edges
of Time like dew on the tip of a leaf
-Rabindranath
Tagore



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