



THE TIMES OF INDIA

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TODAY'S EDITION

► Know the story behind Yuletide and who are Yeomen in Concepts to Classrooms

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► Planning a trip to the hills after your exams are over? Take a tour of Leh— the land of high passes and soak in the mystic charm of the hills

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STUDENT EDITION
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Quote unquote



All the rulers in the democratic set-up, before beginning their routine work, should introspect whether they have any bad characteristics. There is a need to offer just administration and it should be according to people's needs. People are the ultimate lords in democracy and whatever decision has been taken by the dispensation should benefit them. True education is the one which imbues moral values and virtues of humility, discipline, selflessness, compassion, tolerance, forgiveness and mutual respect. Unfortunately, the modern education system tends to focus only on the 'utilitarian' function of education. Such a system is not equipped to deal with the 'moral' or 'spiritual' function of education, which builds the character of our students and allows them to develop a social consciousness and a sense of responsibility

NV Ramana, Chief Justice of India

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Kerala school inches closer to gender neutrality



In a step closer to gender neutrality, a government school in Kerala has decided to introduce a new uniform for all its students. Valanchirangara Government Lower Primary School, near Perumbavoor in Ernakulam district, has introduced a new uniform – 3/4th shorts and shirt, which will be worn by all students. The school, which has a strength of 754 students, had taken the decision on a new dress code in 2018. Initially, it was introduced in the lower primary section of the school but was extended to all students when the facility reopened post-lockdown.

■ The uniforms have been designed by Vidya Mukunan. The Kochi-based designer said that initially parents were concerned about how girl students would use the washroom. She said that several designs were checked before finalising the present dress code. "Girls told us that they feel very comfortable with the new uniform. This was initially implemented among the pre-primary students. Later, after considering the positive response from the parents and the teachers, the school introduced it to the other classes," she added. (More on page 3)

Share your views at toinie175@gmail.com

India's first virtual science lab for children launched

India's first virtual science lab for children – under the 'CSIR Jigyasa' programme that will connect students with scientists across the country was launched on Monday. Describing the virtual lab as a new beginning, Union minister of state for science & technology, Jitendra Singh, said that this will not only take science to all segments of students in every corner of the country, but is also in tune with the National Education Policy (NEP), where students are allowed to choose any subject and the concept of streams has been disbanded. Accordingly, CSIR has partnered with IIT Bombay to develop a virtual lab platform under the 'CSIR Jigyasa' programme, which facilitates classroom learning with laboratory research for school students.

1 The target audience for the virtual lab is students of standards VI to XII (11-18 years), who would like to explore science using different activities

2 The main aim of the virtual lab is to provide quality research exposure and innovative pedagogy for school students to drive their scientific curiosity based on an online interactive medium with simulated experiments, pedagogy based content, videos, chat forums, animations, gaming, quiz, facility sharing, webinars etc

3 The content will be available in English initially, but has been planned to be made available in Hindi and other regional languages as well



The key highlights of the virtual lab are: Open source platform; access content in regional languages; scientist/researchers support; knowledge up-gradation for teachers and students; project-based support; fun-based gaming; need-based videos and animation; simulation experiments; promoting scientific temperament; science-based webinars; student entrepreneurship; student expert forums; student to student forums; simplified content; availability to technical assistance; build confidence and motivation

El Salvador plans first 'Bitcoin City'



El Salvador plans to build the world's first 'Bitcoin City', funded initially by bitcoin-backed bonds, President Nayib Bukele said, doubling down on his bet to harness the crypto currency to fuel investment in the Central American country. Speaking at an event closing a week-long promotion of bitcoin in El Salvador, Bukele said, the city planned in the eastern region of La Union would get geothermal power from a volcano and not levy any taxes except for value added tax (VAT).

El Salvador in September became the first country in the world to adopt bitcoin as legal tender

- Half of the VAT levied would be used to fund the bonds issued to build the city, and the other half would pay for services such as garbage collection, Bukele said, estimating the public infrastructure would cost around 300,000 bitcoins.
- Likening his plan to cities founded by Alexander the Great, Bukele said, Bitcoin City would be circular, with an airport, residential and commercial areas, and feature a central plaza designed to look like a bitcoin symbol from the air.

49th International Emmys: David Tennant, 'Tehran', 'Call My Agent 4' get top awards



The Indian challenge at the 49th International Emmy Awards, which concluded at Casa Cipriani in New York City on late Monday night (US Eastern Time), ended with Nawazuddin Siddiqui losing out to Scottish actor David Tennant in the Best Performance by an Actor category.

- Ram Madhavi's 'Aarya' was edged out by the Israeli spy thriller series 'Tehran', which got The International Emmy for Drama Series. Vir Das's comic take on Indian history, 'Vir Das: For India', made way for yet another Netflix acquisition, 'Call My Agent: Season 4', which walked away with The International Emmy for Comedy.
- 'Tennant', who became famous as The Doctor in the British TV series 'Doctor Who', was honoured for his work in the three-part crime drama miniseries 'Des', which centres around the Scottish serial killer Dennis Nilsen, who was arrested in 1983, after the discovery of human remains which had blocked a drain near his London home.

The International Emmy Awards honour the best in television programming outside of the US. This year, the awards were presented in 11 categories and the nominees were from 24 countries

Now, file e-complaint from your phone



Students from the KL Deemed-to-be University have developed a 'Cyber Security app' that offers features like e-complaint filing, cyber internships, cyber consultation, etc. Developed by D Rahul Shashank, a final year student at the College of Law, KL Deemed-to-be University, this app is available in English and Telugu. According to university officials, this app is simple, convenient, and absolutely crucial to ensure one's digital security.

HOW IT WORKS

- A perfect amalgamation of information, guidance and solution, the app alerts the users before they fall victim to them.
- It also provide the user an understanding of cybercrime and ways to tackle it.
- More importantly, the app helps users to lodge cyber related complaint. Using this feature, a user can file a cyber complaint through the e-filing link, which is provided with the disclaimers in the application.
- One can also check the status of a case that has been filed through this application. The app also provides study material on cyber security and cyber laws, IT Act 2000 and IT Act 2008, cyber forms, and the latest cyber security news.
- Additionally, a list of the cyber police stations is also available on the app to help users find the nearest cyber police stations by enabling the GPS / location. The app also has 'Cyber Legal Aid', which is divided into two sub modules namely cyber expert consultancy and cyber volunteer.



Beginning the journey of learning in an alphabetical order, Times NIE takes you through one concept from each subject every week



TEACHERS, IF YOU HAVE A CONCEPT THAT CAN CHANGE A CLASSROOM, SHARE IT ON

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CLASSROOMS TO EXPERIENCE ZONES

GEOGRAPHY

YOUNGER DRYAS

The Younger Dryas is a cold period of about 1500 years that occurred at about 10,000 to 8,500 years ago. It is believed to have been brought on by a sudden release of cold water into the oceans from behind the North American ice sheets, which were breaking up at about that time.



The Younger Dryas was named after *Dryas octopetala*, a pale yellow wildflower of the rose family, typical of cold open Arctic environments



DID YOU KNOW?

Which period do they represent?

Younger Dryas, also called Younger Dryas stadial, was the cool period between roughly 12,900 and 11,600 years ago that disrupted the prevailing warming trend occurring in the Northern Hemisphere at the end of the Pleistocene Epoch (that lasted from 2.6 million to 11,700 years ago). The Younger Dryas was characterised by cooler average temperatures that returned parts of Europe and North America to ice age conditions.



WHAT CAUSED IT

The leading hypothesis, first proposed by Finnish scientist Claes Rooth in 1982, postulated that large amounts of fresh water were discharged into the North Atlantic about 12,800 years ago. More specifically, the retreat of the Laurentide Ice Sheet allowed Lake Agassiz, a glacial meltwater lake that covered a large part of north-central North America, to drain eastward into the Atlantic Ocean rather than southward into the Mississippi River. Broecker and American geologist George Denton proposed that this large influx of fresh water may have stopped higher-density seawater



in the North Atlantic from descending to lower depths, thereby interrupting thermohaline circulation (a system of surface and deep water currents that distributes large amounts of heat around the globe) and initiating a short-term return to glacial conditions.

BIOLOGY

YEAST



Yeast is a single-celled organism that belongs to the kingdom Fungi. There are more than 500 species and thousands of varieties of yeast that can be found in the soil, sugary liquids (in the fruit and flowers) and on the surface of plants and animals. Yeast plays an important role in the industry of bread and alcoholic beverages and has wide application in biotechnology.

LEARNING WITH NIE

1 Single cell of yeast has 3 to 5 microns in diameter. Visible colonies of yeast are composed of at least one million cells. Package of yeast used for cooking contains billions of cells. Like in other eukaryotic organisms, DNA of yeast is located inside the nucleus. It also contains mitochondria.

2 Anton van Leeuwenhoek saw the cells of yeast under the microscope in 1680, but he failed to identify them as living entities. In 1857, Louis Pasteur discovered that cells of yeasts are responsible for the brewing of beer.

3 Yeast converts sugar from liquid medium into alcohol and carbon dioxide and improves aroma of beer and wine. It was used for making of beer and wine thousands of years before it was discovered.

4 Yeast plays important role in the manufacture of bread and various dough. Ancient Romans learned that dough left in the sun can be 'revived' after adding the sugar. Without knowing, they discovered it.

5 Some species of yeast can induce various diseases in humans and animals. *Candida albicans*, for example, can induce infection in the mouth and gastrointestinal tract of humans.

Our hair, weight and height, among many other features, show the signs of 'compound growth' – the growth 'on top of' the level already achieved. When something grows in a compound manner, it simply keeps growing over the last level and not separately. Compound growth is a special kind of change in something. To better understand the concept of 'compound growth', let's see what would have happened if our hair or nails were not growing the compound way. In that case, hair and nails would grow a fixed length everyday BUT at the same point – the last cut level. You can imagine it to be like one distinct offshoot of growth for every day at the point of last cut. But don't think that compounded growth (or change) is special and about living things only. It's as applicable to non-living things too; in fact, compounded change is the natural law of change. For instance:

■ If you drag a chair some distance towards a table and leave it there for a while, then the next time you have to bring it nearer to the table, you only have to drag it for the distance left to be dragged from the last time. The distance the chair is compounded.
 ■ How would you collect five pencils together? If you already have three, then you only need to add two more and if you already have five you needn't add any! The number of pencils compounded together.
 ■ You must have heard about financially lucrative careers such as tea-tasters but have you heard of a similar category of career w.r.t. chicks. When hens are reared (for eggs), it benefits more if hens are separated from roosters as soon as possible after chicks hatch (born); more and more hens must be reared to get more and more eggs.

CAN YOU GUESS HOW AND WHY?
 The female chicks will lay eggs to be sold through their life time. That's only like 'simple interest' – the same hen giving an egg a day!
 But there is more to be expected from a hen – her eggs could be used to get many more female chicks, who in turn would grow into hens to give more eggs and even more female-chicks out of the eggs and the chain can go on. There is indeed a growth path beyond the 'simple interest' form – the compounded form.

LANGUAGE

YABBER

By Kartik Bajoria
Jaipur-based
Communication Skills
Educator & Writer



Before anything else, let us explore the word Yabber itself. It is believed that yabber originates from a native Australian language known as Yabba. In today's modern parlance, Yabber equates to jabbering, or talking in a manner that is too fast, indistinguishable, unclear. And that is why it is vital in the context of language and communication. That when we talk, communicate and use language, it is not Yabbering or Jabbering but rather speaking in a relaxed pace where we clearly enunciate each word so that we are fully understood and achieve the most basic goals of communicating in the first place.

Many of us unconsciously yabber. Particularly in the context of young students, when we are asked to formally address a gathering, or in most public speaking scenarios, students' tireless efforts at researching and preparing their speeches in many cases turn futile because of yabbering, which is an unconscious manifestation of nervousness.

The natural corollary therefore is, how does one control this tendency to yabber? In my opinion and experience, it can be significantly controlled by regulating our breathing. Having said that mostly this is caused due to subconscious nervousness, if, before speaking, we focus our attention on our breathing and attain an even, relaxed, unhurried rhythm, it will reflect directly in the manner and speed of our communication and reduce yabbering to a great extent. Try it yourself. Stand in front of a mirror, regulate your breathing, and then talk. The results will be pleasantly surprising. Yabbering, gone!



TEACHER PROMPT Ask students to stand in front of the mirror and then talk

MATHS

By Sandeep Srivastava
Educator since 20 yrs, he specialises in making Maths easy and fun



A specific set of mathematical concepts are used in the world of commerce (anything predominantly related to buying, selling or borrowing). For example, borrowing a sum of 1,00,000, at 10% interest, payable over 12 equal monthly instalments. Commercial math applies a wide range of mathematical applications, but we will focus on one primary foundation of maths used in commerce – interest; after all, the value of money is very important in commerce.

WHY INTEREST IS CHARGED ON BORROWED MONEY?

The extra amount paid for the use of money or to borrow money is what we call INTEREST.

Simply put, money buys less as time passes; for example, ₹100 may get us a dozen crayons today, but may cost ₹104 a year later. Inflation in prices depreciates the value of a given sum of money (i.e., same amount of money will buy less things). The lenders have to ensure that they have more money to be able to buy what money can buy today. Indeed, longer the tenure of borrowing, the more the money as interest to compensate for the higher depreciation in value of borrowed/loaned money.

Time and value of money are inversely related; this way, money is not same as other assets, such as gold, land, securities, etc. (there are market driven – their value can appreciate, or depreciate).

Plus, money when invested as a capital in a business may earn profit; so, money appreciates when well-invested. Lenders see interest as the opportunity cost of depreciation in value, as well as loss of opportunity to earn profit by investing it elsewhere.

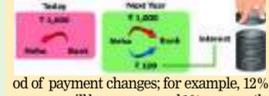
HOW IS AN INTEREST (AMOUNT) EXPRESSED?
 Percent is the simplest way to express quantities that need to be compared, discussed. Thus, interest is expressed as 'interest rate', i.e., amount of interest to be paid per 100 of principal amount; this makes interest a small number; for example, 3.34%, 11.2%, etc.

For example, Neha wants to borrow 1,000. The local bank says '10% Interest'. So to borrow 1,000 for 1 year, it will cost her: $(1000 \times \frac{10}{100}) = 100$. In this case, the 'Interest' is 100, and the 'Interest Rate' is 10% (but people often say '10% Interest' without saying 'Rate').

YIELD (COMMERCIAL MATH)

Implicit in interest rate is time

Obviously, interest rate will change if period of payment changes; for example, 12% per year will become around 1% per month. We never mention interest rate as something like 8%, it is always along with the period of the interest rate, 8% per annum, 8% half-yearly, etc.



THE (TOTAL) TIME OF BORROWING AFFECTS INTEREST AMOUNT

The interest rate gives the interest amount for one unit of time – the time in the interest rate, e.g., for '1 year' in 10% per year. More interest will accrue if the time period is more than the time period in the interest rate. For example, if the interest rate is 3% per quarter, then the interest payable for 5 quarters will be 5 times interest rate per quarter, i.e., $5 \times 3\% = 15\%$.

INTEREST AMOUNT IS A MULTIPLE OF THE INTEREST RATE

There are three possible scenarios once interest rate is known:

■ The principal amount is not 100 (as is expected in real life). Then the interest amount for the period of the interest rate = Interest rate x Principal.

■ The total time period of borrowing is more, or less, than the period of the interest rate; for example, if the total time period of borrowing is one and half years, and the interest rate is 1% per month, then the total time period will be expressed in multiples of '1 month', i.e., 18 months.

■ The principal is not 100, and the total time period of is not the same as the period of the interest rate.

Clearly, the interest amount = Interest rate x Principal x time! In other words, the interest amount will be adjusted for the actual principal amount, and also adjusted for the time period of the borrowed amount.

HOW IS AN INTEREST AMOUNT COMPUTED?

Mathematically, if 'r' is the interest rate (in %, as $x/100$), 'p' is the capital, and 't' is the total time of borrowing (expressed as multiples of the interest rate time period), Interest amount = $r \times p \times t = p \times r \times t$

AMOUNT PAID BACK FOR BORROWED MONEY

Total amount paid back to lender = Principal amount + Interest amount.

THE TWO WAYS TO PAY INTEREST

A closer look at interest payouts presents us with two distinct scenarios:

Interest, due as per the tenure of the loan, is paid to the lender at the end of that period (or at the end of every time period in interest rate, as if that's the tenure and renewed after every interest payment). For instance, a principal taken for 7 quarters (tenure), at 2% per quarter, will be paid as '7x2% of the principal', at the end of the 7th quarter, as interest amount (or, 2% is paid every quarter for each of the 7 quarters).

The interest amount computed this way is called simple interest – it's simple 'p x r x t'. 't' is 1, or the total time period.

■ Interest, due as per the time period in the interest rate, is paid to the lender at the end of the tenure, but with interest on every interest amount as per the interest rate time period. Every due interest payment becomes additional principal for the rest of the tenure, and interest is to be paid on it too.

■ For instance, for the above example, 2% of principal can be paid every quarter. OR interest is paid at the end of the tenure of 7 quarters as under:

7x2% of principal PLUS interest of 2% of the first quarter interest payment for 6 quarters (from end of first quarter to the end of the tenure – 7 quarters) PLUS interest of 2% of second interest payment for 5 quarters PLUS interest of 2% of third interest payment for 4 quarters, and so on.

The interest amount computed this way is called compound interest – it's not 'p x r x t'; it is a series of different 'p x r x t'.

WHAT ABOUT 'INTEREST ON INTEREST'?

When the tenure of a loan and the time period of the interest rate are the same, there is only one interest amount due to be paid; for example, interest rate is 5% per year and the loan's tenure is 1 year. However, for a simple situation like – 5% per year for a loan for 2 years – there are more than one interest amounts to be paid, at the end of first and second years. Expectedly, there are two ways interest amounts can be paid back:

■ As interest, as and when due – simple interest.

■ As additional principal, the borrower keeps the interest amount till the end of the tenure, much like the original principal – a 'compounding' situation (where the principal is growing). We will explore this conceptually.

COMPOUND INTEREST

It's the nature's chosen way of growth and change.

We all know that nails and hair grow every day. But how do they grow? They grow over and above the 'yesterday's length' and not over and above the 'last cut length'. Our height and weight also grow the same way.

HISTORY

YEOMAN

Yeoman, in English history, a class intermediate between the gentry and the labourers; a yeoman was usually a landholder but could also be a retainer, guard, attendant, or subordinate official. The word appears in Middle



English as yemen, or yoman, and is perhaps a contraction of yeng man or yong man, meaning young man, or attendant. Geoffrey Chaucer's *Canterbury Tales* (late 14th century) depicts a yeoman who is a forester and a retainer. Most yeomen of the later Middle Ages were probably occupied in cultivating the land; Raphael Holinshed, in his *Chronicles* (1577), described them as having free land worth £6 (originally 40 shillings) annually and as not being entitled to bear arms. In the early 15th century, yeoman was the rank of chivalry between page and squire. By the late 17th century, yeoman became a rank in the new Royal Navy for the common seamen who were in charge of ship's stores, such as food-stuffs, gunpowder, and sails.

DID YOU KNOW?

Yeomanry was the name applied to groups of freeborn commoners engaged as household guards, or raised as an army during times of war



GENERAL KNOWLEDGE



YULETIDE

Yule comes from the Old Norse *jól* and Old English *geóhol*, which was the season of hunting after the harvest was done. This fell in what we now call December, so it eventually became associated with the Christmas Holiday. In Old English, it was referred to as a mid-winter pagan festival that took place in December.