



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



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

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CLASSROOMS TO EXPERIENCE ZONES

MATHS

BOUNTY

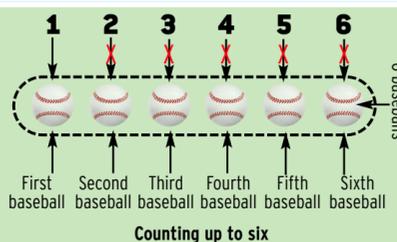


Sandeep Srivastava, educator for 20 years, specialises in making Maths easy and fun

Recall, A stood for 'Approximation', for quantification that is less than certain, not precise. Moving forward, B must stand for quantification that is very specific, certain. In mathematics, counting is the name given to the process that helps us express precise quantity of given things. Incidentally, a historical need for counting was 'Bounty' — a sum paid by governments to promote trade, a quantity that better be precise. Hence, we can say, in math B stands for 'Bounty'.

Let's count

We should count using counting numbers (ordinal numbers) — First (I), Second (II), Third (III), Fourth (IV) ... and NOT One (1), Two (2), Three (3), Four (4) ... (cardinal numbers). Why? For instance:



Nature of counting numbers

Unfortunately, school math is inaccurate on counting. For example, Roman numerals are symbols for counting, but are taught in Grade III/IV without any relevance, and are treated as cardinal numbers (e.g., school math adds Roman numbers). Ordinal numbers can't be added; what may be 'first apple + third apple?' First is one quantity as is third (or eleventh, or hundred first), so it's 2 apples. In the same way, 'nineteenth ball and seventy first ball' and 'One hundredth ball and two thousandth ball' are also 2 balls.

Why do we count?

You are right, to get the cardinal quantity (the 'given quantity'). Indeed, the last ordinal number in a counting gives us the 'answer' to the 'how many/much' question). Thus, if the last thing counted is Nineteenth, the quantity of things is Nineteen (19).

Unit is everything in counting

Every counting starts with defining what's the unit or '1' of counting. We find the number of that 1 in the given quantity. Underlined quantities are the unit of counting in the examples:
Count the apples in

6 apples (not 6 alone)
Colour and size are not specified, any 1 apple is counted as 1 apple; 1 apple is the unit.
Count the red apples in

2 red apples
Count the round apples (○) in

2 round apples
Count the green and round apples in

0 round and green apples.
1 green and round apple is the '1', unit of counting.

3 pairs of apples
Count the pairs of apple (○○) in

1 pair of apples is the '1', unit of counting.

Count (○) (1/2 apple) in



Count (○) in



Count (₹) in



₹15 is '1', unit of counting; there are 4 ₹15 possible in ₹60.

Count (dozen) in



6 eggs are only + dozen eggs.

CRITICAL IMPORTANCE: Poor foundation of counting is at the heart of poor math for most. Not looking at a unit of quantities is a very

common and a big mistake.

IT'S EASY FOR CHILDREN: Learning to count is easier too — 'Third' is simpler than 'Three' as a concept, there is no association with quantity in 'Third' but 'Three' is also about 3 things.

NUMBERS: Counting is one of the ways by which numbers are generated, measurement, however, is the only other way.

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LANGUAGE

BACKGROUND

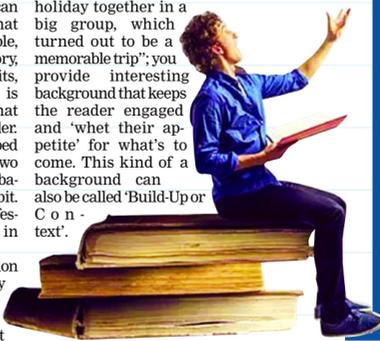


Kartik Bajoria, Counsellor and educator specialising in communication skills

In most types of writing — fiction or non-fiction, background is essential. We can call any important information that makes the piece of writing more relatable, background. Therefore, in the case of a story, when we share information about the habits, traits, and appearance of a character, it is important 'background' information that helps bring the character to life for the reader.

Similarly, background is used in non-fiction writing as well. If you were writing an essay about a wonderful holiday/vacation you took and began your essay from the point at which you arrived at your holiday destination, it

might seem a little abrupt. However, if you wrote even a single sentence such as, "During the recent summer holidays, my parents and I decided to invite my cousins and take a beach-holiday together in a big group, which turned out to be a memorable trip"; you provide interesting background that keeps the reader engaged and 'whet their appetite' for what's to come. This kind of a background can also be called 'Build-Up or Context'.



GEOGRAPHY

BAY

A bay is a body of water partially surrounded by land. A bay is usually smaller and less enclosed than a gulf. The mouth of the bay, where it meets the ocean or the lake, is typically wider than that of a gulf. Eg: Hudson Bay, Marina Bay, Bay Of Bengal.

OTHER NAMES OF BAYS: Bays can also be called lagoons, sounds, and bights. Lagos, the capital of Nigeria, is a bayside city. It sits on Lagos Lagoon, on the Bight of Benin, in the Gulf of Guinea, in the Atlantic Ocean.

HOW ARE BAYS FORMED?

Bays form in many ways. Plate tectonics, the process of continents drifting together and rifting apart, causes the formation of many large bays. Many bays are formed as the coastline erodes into the ocean. For example, the Guanabara Bay in South America.

DID YOU KNOW? The Bay of Bengal, the largest bay in the world, was formed by plate tectonics. Millions of years ago, the Indian subcontinent crashed into the the Eurasian plate network. As plate tectonics remain an active force in the Bay of Bengal even today, the region is prone to underwater earthquakes and tsunamis.

Quiz TIME Take this quiz Name a freshwater bay.

ANS: A bay on the Swan River, near the busy urban area of Perth, Australia.

SOURCE: NATIONAL GEOGRAPHIC

HISTORY

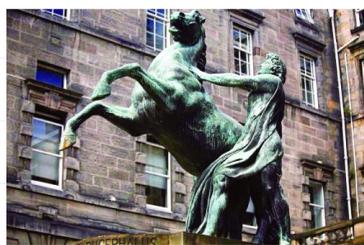
BUCEPHALUS

Mahia Bashir writes for Times NIE about interesting events and terms from History. The author is pursuing BA prog at St Stephen's College, and interning at the History Diaries, an initiative to revamp the current pedagogical system of History through tours, drama in schools



associated with Bucephalus. According to one account, Bucephalus was presented to Alexander's father Philip II as a gift. However, no one was able to mount or bridle the horse. At that time, the 14 year old Alexander realised that the horse feared its own shadow, and used this to his benefit. He succeeded in taming the stubborn horse.

According to another story, Bucephalus was Alexander's companion in the battlefield and died at the Battle of Hydaspes fighting against king Porus in 326 BC.



Alexander named a town (most likely in Punjab) in honour of his horse. In the 'Natural History', the historian Pliny the Elder writes about the horse: "So that when it died, the king duly performed its obsequies, and built around its tomb a city, which he named after it".

Bucephalus was the horse of Alexander — the Great of Macedonia. It is considered to be one of the most famous horses in human history. The name derives from the Greek words 'Bous' meaning 'Ox' and 'Kephalos' meaning 'head'. Based on mosaics unearthed at Pompeii, it is assumed that the horse was jet black in colour with a white star-shaped mark on the forehead.

There are several fascinating stories

DID YOU KNOW?

Ancient accounts state that Bucephalus died after the Battle of Hydaspes in 326 BC, in what is now modern Punjab Province of Pakistan, and is buried in Jalalpur Sharif, outside Jhelum, Punjab, Pakistan. Another account states that Bucephalus is buried in Phalia, a town in Pakistan's Mandi Bahauddin District in Punjab Province, which is named after him (Alexandria Bucephalous).

CHEMISTRY

BOILING POINT



Salt is put on the roads before they freeze or before the snow arrives. Then, as snow falls, the salt mixes with it, lowering its freezing point. The result is a brine solution, preventing subsequent ice forming.

BOILING: Boiling is the name for the phase transition from the liquid to the gas phase.
BOILING POINT: The boiling point is the temperature at which the vapour pressure of a liquid equals the external pressure surrounding the liquid. Therefore, the boiling point of a liquid depends on atmospheric pressure.
BOILING POINT ELEVATION: Boiling point elevation occurs when the boiling point of a solvent is increased when another compound is added, such that the resulting solution has a higher boiling point than the pure solvent.
EXAMPLE: The boiling point of salted water is higher than the boiling point of pure water. (see experiment)

EXPERIMENT
Half fill a funnel with ice. Clamp the funnel above a beaker. Insert a -20°-110°C thermometer inside the ice. Put salt over the ice, and watch the water trickle into the beaker as the ice melts. The more salt you add, the more the ice melts. The melted ice does not re-freeze as salt water has a lower freezing point than fresh water.

ECONOMICS

BRAND

Simply put, a brand is a promise a firm makes to a customer. It tells them what they can expect from the products and services, and it differentiates the firm's offering from that of the competitors. Your brand is derived from who you are, who you want to be and who people perceive you to be.

How to teach brand value

- 1 Make groups. Let Team A be in production and Team B the marketers, Team C the buyers.
- 2 Turn the classroom to a market and tell students to first sell a product at original production cost.
- 3 Then, ask Team B to add 'brand value' and see the same product at a higher price.

LEARNING OUTCOME: They will know how branding drives purchasing.
PART B OF ACTIVITY: Ask all students to do 'personal branding' and find ways in which they can be employable.



Rishabh Pant should be allowed to keep on home soil. Keeping against our spinners will test his keeping skills. Why are we hiding him from turning tracks? Where else will he learn?"
Saba Karim, former India wicketkeeper



Rishabh Pant

Photo: AFP

I think he (Rishabh) will enjoy keeping wickets (in India) more. You are always in the game. You get a lot of opportunities also. You might miss a couple but you will always get chances whereas on flatter wickets, it is very difficult to keep wickets because hardly any ball comes to you."
Kiran More, former India wicketkeeper

SPECIALIST KEEPER or EFFECTIVE BATSMAN?

Rishabh Pant's match-saving and match-winning performances against Australia in the Sydney and Brisbane Tests may force the Indian team management to discard their old plan of playing Wriddhiman Saha at home and Pant outside Asia

RISHABH WILL DO A GOOD JOB: KIRAN MORE

Although the team management is yet to finalise the eleven, the Indian team that faces England in the first Test from February 5 may feature Pant and not Saha, considering that India are likely to play five bowlers. With Kohli likely to be back at No. 4 and Ajinkya Rahane at No. 5, Pant will most probably bat at No. 6 followed by a couple of bowling all-rounders like R Ashwin/Washington Sundar/Axar Patel.

Up until now, Pant's weak wicket-keeping skills were the reason why he wasn't played in Tests in India. He has played just two of his 16 Tests in India and they came well over two years ago.

India also has an option of playing both. But for the sake of balance — playing two wicket-keepers may reduce India's bowling options as Saha

will walk in at No. 7 — India may play Pant in what will be his first Test in India since October, 2018. Though it is considered risky to not play a conventional wicket-keeper on Indian pitches, former India stumper Kiran More said that Pant will come good as Indian tracks offer a lot of chances to dismiss batsmen. More also said that keeping in India demands total concentration and that is why it can get easier to keep wickets here.

It depends on the balance: Ben Foakes
Indian or sub-continent wickets being good for wicket-keeping is something that England wicket-keeper Jos Buttler also discussed while speaking to Indian media.

"It is a challenge, but it is also a great place to keep wickets because you are always in the game. There are quick,

reactive chances. I certainly enjoyed it in Sri Lanka. I think wicket-keeping in spinning conditions is a lot of fun," Buttler said.

On Sunday, England's reserve wicket-keeper Ben Foakes said choosing between a specialist wicket-keeper Saha or batsman-wicket keeper Pant will depend on the balance.

"You need to have a blend of both. I think it depends on the batting line-up. If you have a batting line-up that is scoring 600 runs every time then you go for specialist wicket-keeper. If you want a frontline batsmen then you go for a batting wicket-keeper," he told the media.

It looks like both India and England may go for batting wicket-keepers with specialists Foakes and Saha warming the bench at least in the first Test.

FAITHKEEPERS

A look at the wicket-keeping options for India and England for the first test beginning on Feb 5 in Chennai

INDIA					ENGLAND				
WRIDDHIMAN SAHA Age: 36					JOS BUTTLER Age: 30				
OVERALL	Matches	Runs	Avg	Catches/Stumpings	OVERALL	Matches	Runs	Avg	Catches/Stumpings
	38	1,251	29.09	92/11		49	2674	34.72	95/1
IN INDIA					IN INDIA				
	Matches	Runs	Avg	Catches/Stumpings		Matches	Runs	Avg	Catches/Stumpings
	23	678	30.81	56/4		3	154	38.50	0/0
RISHABH PANT Age: 23					BEN FOAKES Age: 27				
OVERALL	Matches	Runs	Avg	Catches/Stumpings	OVERALL	Matches	Runs	Avg	Catches/Stumpings
	16	1,088	43.52	67/2		5	332	41.5	10/2
IN INDIA					IN INDIA				
	Matches	Runs	Avg	Catches/Stumpings		Matches	Runs	Avg	Catches/Stumpings
	2	184	92	5/2		Yet to play			

Why India start favourites against England



Virat Kohli

Former Australia captain Ian Chappell believes India "will start as favourites" in the upcoming Test series against England owing to their "quality pace bowling" attack and a consistent batting top-order

'ADDITION OF KOHLI WILL PROVIDE A BULLETPROOF CLOAK TO THE TEAM'

India will start as favourites after an exhilarating victory over Australia, overcoming all obstacles. When you add the name Virat Kohli to the batting order, the team suddenly assumes a bullet-proof cloak. In also adding the names R Ashwin, Hardik Pandya and Ishant Sharma to the list of available players, India take on an unbeatable appearance.

India's top three feature an impressive Shubman Gill, a talented but flawed Rohit Sharma and the indomitable Cheteshwar Pujara, which places them well ahead of England's top order.

Ajinkya Rahane, Rishabh Pant and the possible addition of Pandya have India well placed to take full advantage of any good start. The ability to swiftly accelerate the scoring is nearly as important to winning Test matches as the capability of taking 20 wickets.

England are similarly placed with Stokes and Jos Buttler as their lethal weapons. The possible return of Ollie Pope would add some dependability to the threatening nature of that section of the batting order. However Buttler's departure after just one Test and the possible return of Ravindra Jadeja to the Indian line-up would swing the scales further in favour of the home team.

The presence of Archer, along with the skill and experience of stalwarts Jimmy Anderson and Stuart Broad, would normally provide England with an advantage in the pace department.

However India's improvement in that category is amply illustrated by their performance in matching Australia's much-vaunted pace attack in two successive away series.

Ian Chappell, former Australia captain

Messi hits goal 650 as Barcelona get revenge on Athletic



Photo: AP

Lionel Messi scored his 650th goal for Barcelona while Antoine Griezmann struck the winner in a 2-1 home success over Athletic Bilbao in La Liga, avenging a defeat by the Basque side in the Spanish Super Cup final. Messi curled in a stunning free kick after 20 minutes for his milestone goal on the same day the club pledged to sue Spanish newspaper El Mundo for publishing the full details of the Argentine's contract.

Ronald Koeman's side recorded a fifth straight Liga win and moved above Real Madrid into second on goal difference with 40 points, 10 behind Atletico Madrid who have a game in hand. Griezmann paid tribute to Messi after the game when asked whether the Argentine, who tried to leave Barcelona in the close season, was being pushed further away from the club. "We're all enjoying Messi, he's a legend and we hope he can continue to help the club to win," said the Frenchman. REUTERS

QUIZ TIME!

Q1: Which of the following players hold the record of most runs scored by a player in a Test match innings?

- a) Sir Donald Bradman b) Sachin Tendulkar
c) Brian Lara d) Sir Vivian Richards

Q2: Who is the youngest player to appear in a FIFA World Cup Final?

- a) Franz Beckenbauer b) Johan Cruyff
c) Pele d) Diego Maradona

Q3: Which of the following women players hold the record of fastest serve of a tennis ball?

- a) Sabine Lisicki b) Venus Williams
c) Petra Kvitova d) Ana Ivanovic

Q4: The most medals won at the World Artistic Gymnastics Championships by a gymnast is 25, achieved by which of the following athletes?

- a) Laurie Hernandez b) Larisa Latynina
c) Gina Gogean d) Simone Biles

Q5: Which of the following two players hold the record of highest partnership for any wicket in a One-Day International?

- a) Sir Vivian Richards and Sir Donald Bradman
b) Chris Gayle and Marlon Samuels
c) Sachin Tendulkar and Rahul Dravid
d) Sir Vivian Richards and Clive Lloyd

Q6: Other than Cristiano Ronaldo, which of the following two players hold the record of most goals scored in a single FIFA Club World Cup match?

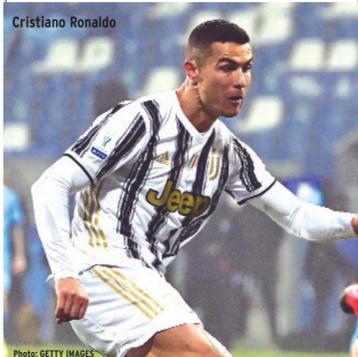


Photo: GETTY IMAGES

- a) Luis Suarez and Gareth Bale
b) Karim Benzema and Luis Suarez
c) Gareth Bale and Karim Benzema
d) Lionel Messi and Sergio Ramos

Q7: Which of the following athletes hold the record of most gymnastic giants on asymmetric bars in one minute?

- a) Laurie Hernandez b) Aly Raisman
c) Esther Moya Salvador d) Simone Biles

Q8: Who is the oldest female ice hockey medalist at Winter Olympic Games?

- a) Sarah Vaillancourt
b) Jocelyne Lamoureux
c) Monique Lamoureux d) Riikka Valila

Q9: The most saves in a single and was achieved by which of the following players?

- a) Peter Schmeichel b) Tim Howard
c) Oliver Kahn d) Gianluigi Buffon

Q10: Which English captain's 71-ball innings of 148 was the first time a batsman had scored a century of sixes – 102 runs in total – in international cricket?

- a) Stuart Broad b) James Taylor
c) Jos Buttler d) Eoin Morgan

ANSWERS: 1 c) Brian Lara 2 c) Pele
3 a) Sabine Lisicki 4 d) Simone Biles
5 b) Chris Gayle and Marlon Samuels
6 a) Luis Suarez and Gareth Bale
7 c) Esther Moya Salvador 8 d) Riikka Valila
9 b) Tim Howard 10 d) Eoin Morgan