

LUCA, Version 4.01

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"Are we ready?"



On a trip to a natural history museum with his mother, Mittu is upset by his mother's insistence that all the life exhibits are fossils of his distant cousins. Join Mittu as he sets out to check the truth of this statement and begins his journey of understanding 'Evolution'.



Mittu nodded excitedly and stood with his pen poised over his notepad. They were standing right in front of a working model of his favourite animal, the Tyrannosaurus Rex at the Natural History Museum! He waited for mom to begin.

"Dinosaurs lived in the Jurassic and the Cretaceous period of the Mesozoic era. Remember the movie, 'Jurassic park'...?" Mom looked at Mittu. "Now you know why it is called Jurassic, right?" Mittu nodded knowingly.

Mom continued "Dinosaurs belonged to a class of animals called 'Archosaurs'. After the Triassic extinction over 200 million years ago, which wiped out a large number of living things on earth, dinosaurs grew in number and became dominant. And...." Mom gave a significant pause.

"Yes...!" Mittu looked up expectantly.

"The dinosaurs are your distant cousins!" Mom ended matter-of-factly and moved on.





Mittu gaped for a moment, wondering if he had heard it right, but quickly recovered and rushed to join Mom at the next exhibit, a stuffed 'Secretary Bird'.

Mom began "This is a bird of prey found in the Sahara deserts of Africa. It looks partly like an eagle, partly like a crane, and has very long legs which help it catch prey. It walks through its hunting grounds on foot in the day, and flies up to its nest, usually built in an Acacia tree, at night. Can you see its eyelashes?" Mom paused again, and Mittu looked up.

"This too is your distant cousin". Mittu frowned.

"Yes. You heard me right." Mom smiled "The Secretary bird is a distant cousin of yours, and of the dinosaurs too".

Mittu thought the whole thing was a joke, and laughed heartily. He pointed to the skeleton of a whale in the next section and said mockingly, "Oh yeah...? And that is your distant cousin, right?"

"Yes" said Mom solemnly, "and yours and the dinosaur's too".

Mittu was perplexed. He wondered if he had been rude to any of his cousins lately and called them names. Try as he might, he could not remember quarrelling with anyone this summer, let alone his cousins. In fact, he'd been especially good the whole month because he wanted mom to come with him to the museum. And, now, this! Maybe, it was a joke after all.



The next few sections of the museum had displays of the skeletons of mammoths, stuffed Rhinos, and the skulls of humans who'd lived during the Indus Valley Civilization. Mom explained each of them in detail, but always ended with the same phrase "And this too is your distant cousin!"

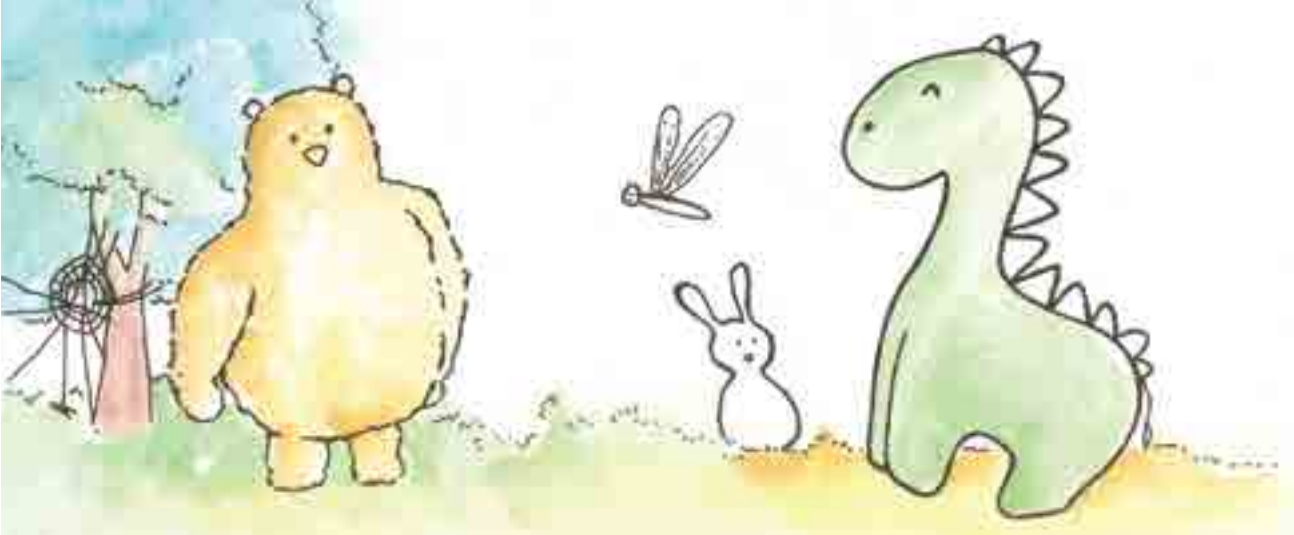
This wasn't funny anymore! Mittu was so annoyed, he wanted to scream out loud, but he knew he would be thrown out of the museum if he did - so he tried to keep his cool.

"Ahem" Mittu cleared his throat, and began with as much sarcasm as he could muster "Mom, what else here is my distant cousin? You see, I would like to know exactly how big my family tree is."

"Well, all the life exhibits!" Mom replied placidly.

"Will you please stop it?" Mittu snapped. "It's not funny. In fact, it's pretty annoying".

"What is so annoying about it? They ARE your very, very distant cousins" Mom replied moving to the nearest bench.



"So, the dinosaurs, birds, every species of animals, plants and bacteria are related to me and also to each other?" Mittu asked in exasperation.

"Yes!"

"No!"

"Why not?"

"Because they are plants, insects, and animals, and I am a human".

"Aha" said Mom encouragingly.

Mittu tried to reason with her. "I am different. I am more evolved"

"How?" Mom asked "From what did you evolve?"





"Early man?" Mittu answered thoughtfully.

"And who did 'early man' evolve from?"

"Chimps...?"

"So, are chimps your distant relatives?"

"Well...yes. Chimps, gorillas, apes in general..."

"Good. But, why not the birds and the dinosaurs? Why not any of the other animals?"

Mittu thought aloud, "Dinosaurs are huge, birds fly, and other animals...there is no way I could have evolved from them" his voice trailed off.

"Fishes, birds, dinosaurs, reptiles, amphibians and other animals have two pairs of limbs - fore limbs and hind limbs - don't they? And, they have a spinal column and blood?"



Mittu brightened "But, some animals, like the octopus, do not have skeletons...so, they are not my cousins, are they? And, what about snakes?" he smiled proudly.

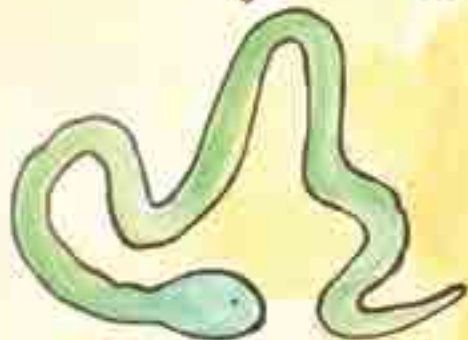
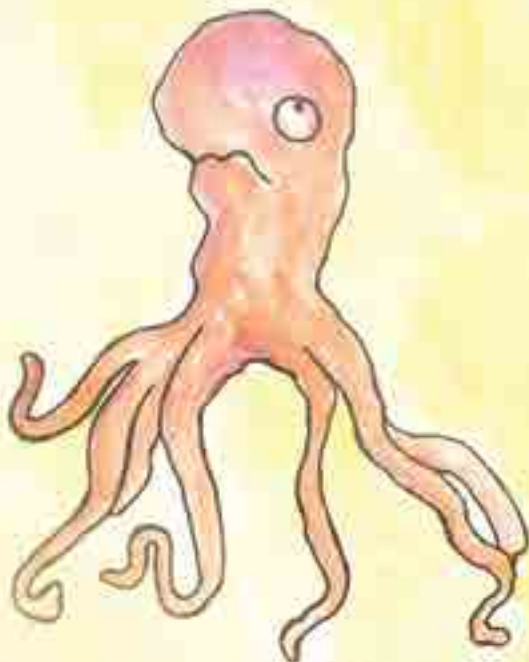
"But, all these animals have eyes and nerves, don't they?" Mom asked. Mittu nodded quietly.

"So, are we not similar? How could we be similar, if we haven't evolved from something common?"

Umm...maybe, all animals evolved from a common ancestor," Mittu replied sheepishly, "but definitely not trees and micro-organisms!"

"Why not?" Mom probed.

"Animals can move about, talk, eat, grow, respond and..."



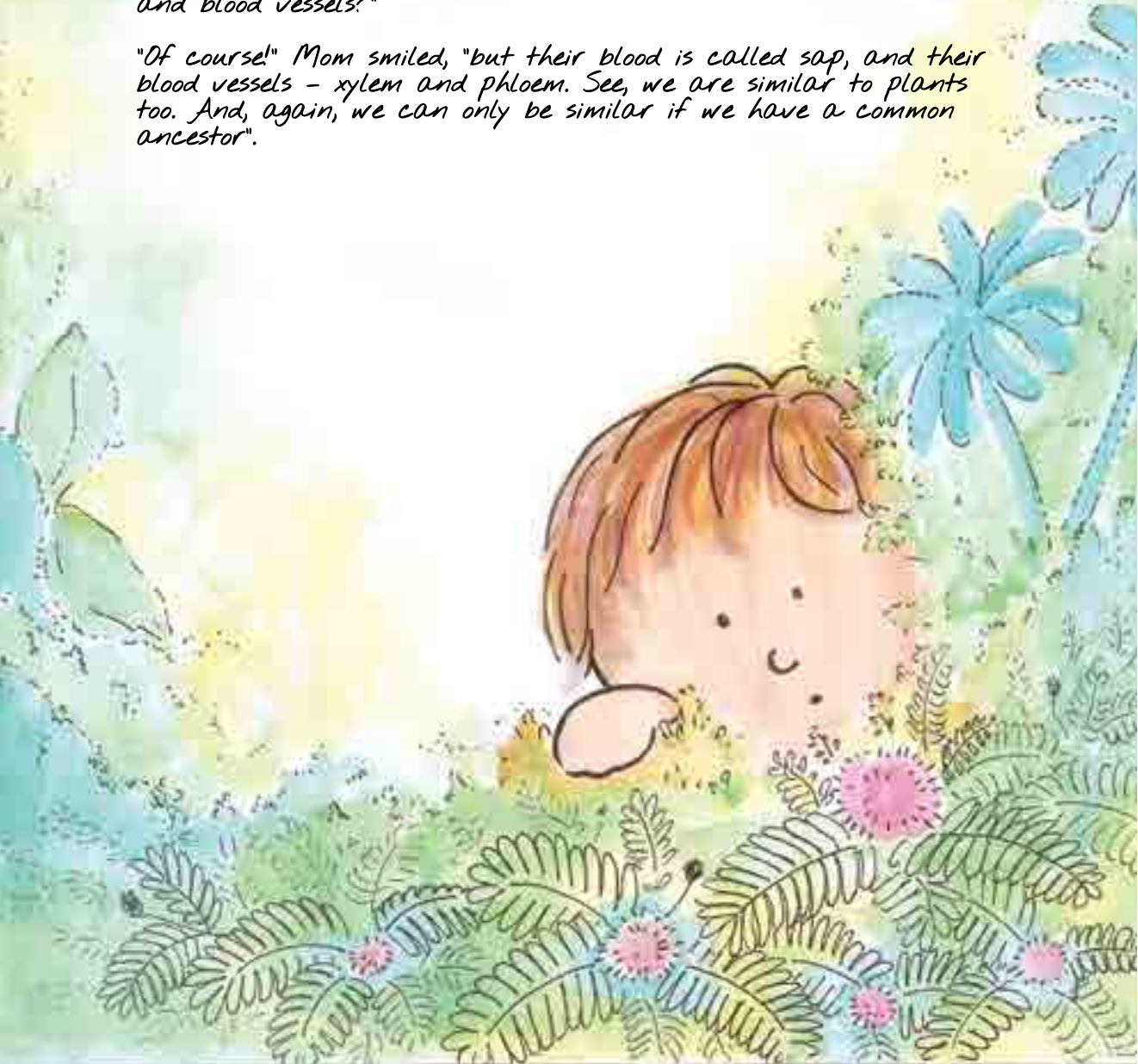
"Plants too can grow and eat. They too respond to light in the sky and water in the earth - by spreading their branches to get maximum light, and their roots to long distances. Remember your favourite plant - the 'Touch-me-not'? It does respond to your touch, doesn't it?"

Mittu wondered at this.

Mom continued, "Do you remember, Mittu, last month we went to a 2-acre park, where we saw many trees growing from the same mother tree? That too, is one kind of movement, isn't it?"

"Well..." Mittu was not sure anymore, "but, do plants have blood and blood vessels?"

"Of course!" Mom smiled, "but their blood is called sap, and their blood vessels - xylem and phloem. See, we are similar to plants too. And, again, we can only be similar if we have a common ancestor".



"But, what about micro-organisms?"

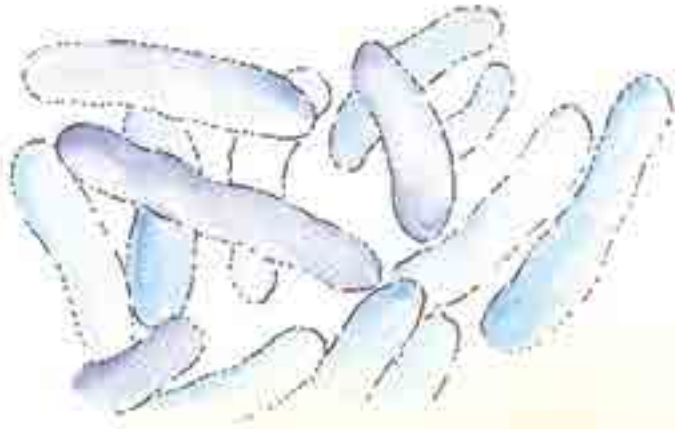
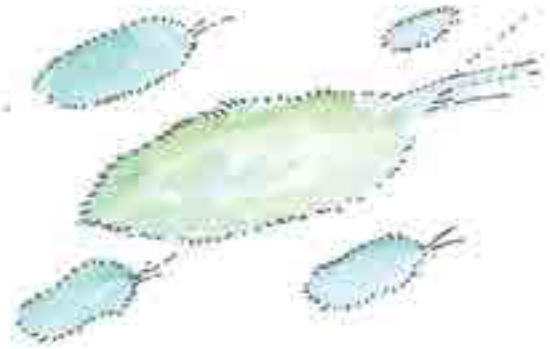
"What are all living things made up of?" Mom answered Mittu with a question.

"Cells!" Mittu said brightly.

"And aren't micro-organisms made up of one or a few cells!" Mom replied easily.

"But..." Mittu looked doubtful.

"Come on Mittu," Mom pleaded. "Accept it. Micro-organisms too eat, grow and respond to stimuli. Otherwise, how do you think they live? The difference is that all these processes in a micro-organism happen in one cell, instead of many cells. If you were to take out one cell from your body, and put it beside a bacterial cell, you would find many similarities. Both cells would have a cell membrane, DNA, and cytoplasm! Don't you see? We are similar to micro-organisms too, at the cellular level".



"But, we are different too, aren't we Mom?"

"Yes, we have developed these differences to suit our surroundings. In other words, we've adapted to our environment. One cell befriended another cell so that they could help each other. Then, some more cells joined these two, and they formed colonies. Cells in these colonies lived together for so long that they started functioning together as one unit, and, thus, evolved into multicellular organisms like plants, animals and humans. Each species, then, adapted differently, and so you see all these variations" Mom explained.

Mittu sat swinging his legs for a while. Mom waited.

After a while, Mittu began slowly, "So...all life forms are distant, distant relatives of each other, no matter how different they look from each other?"

Mom nodded, and looked pleased.

"We are relatives because we have so many similarities, which could come only if we have all evolved from a common ancestor, right?"

Mom smiled.



"And, because we are all made up of cells, would it be okay for me to assume that our common ancestor could be a single-celled micro-organism?" Mittu smiled.

Mom was elated. "Great going, Mittu!" she said and patted him on the back.

"So, when did this single-celled organism...my actual ancestor begin evolving?"

"Approximately 4 billion years ago...and, it is called LUCA (or the last universal common ancestor)," Mom answered happily.

"One last question mom," Mittu said mischievously, "What is my name?"

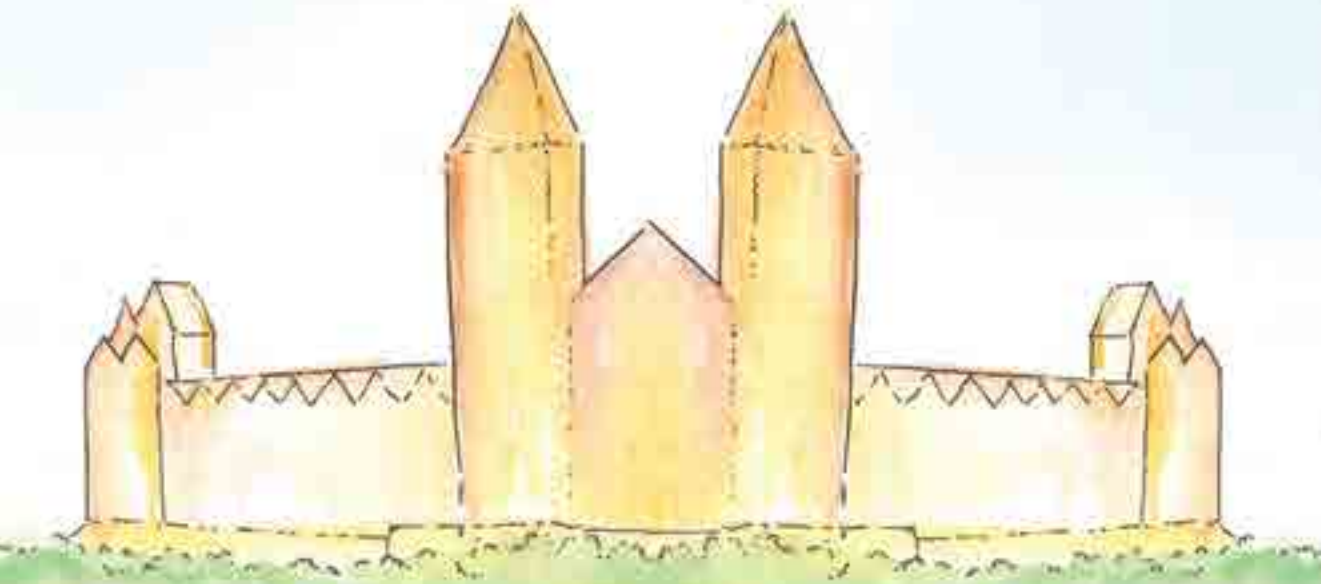
"Mittu"

"No!"

It was mom's turn to look perplexed.

"My name is LUCA, version 4.01 billion!"





About the Author

Rohini Chintha is an Assistant Professor (C) at the Department of Genetics and Biotechnology, University College for Women, Hyderabad. She writes in Telugu and English, is passionate about writing for children, and believes that 'A Happy Childhood builds a Happy Society'. About 75 of her stories for children have been published in various magazines.

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